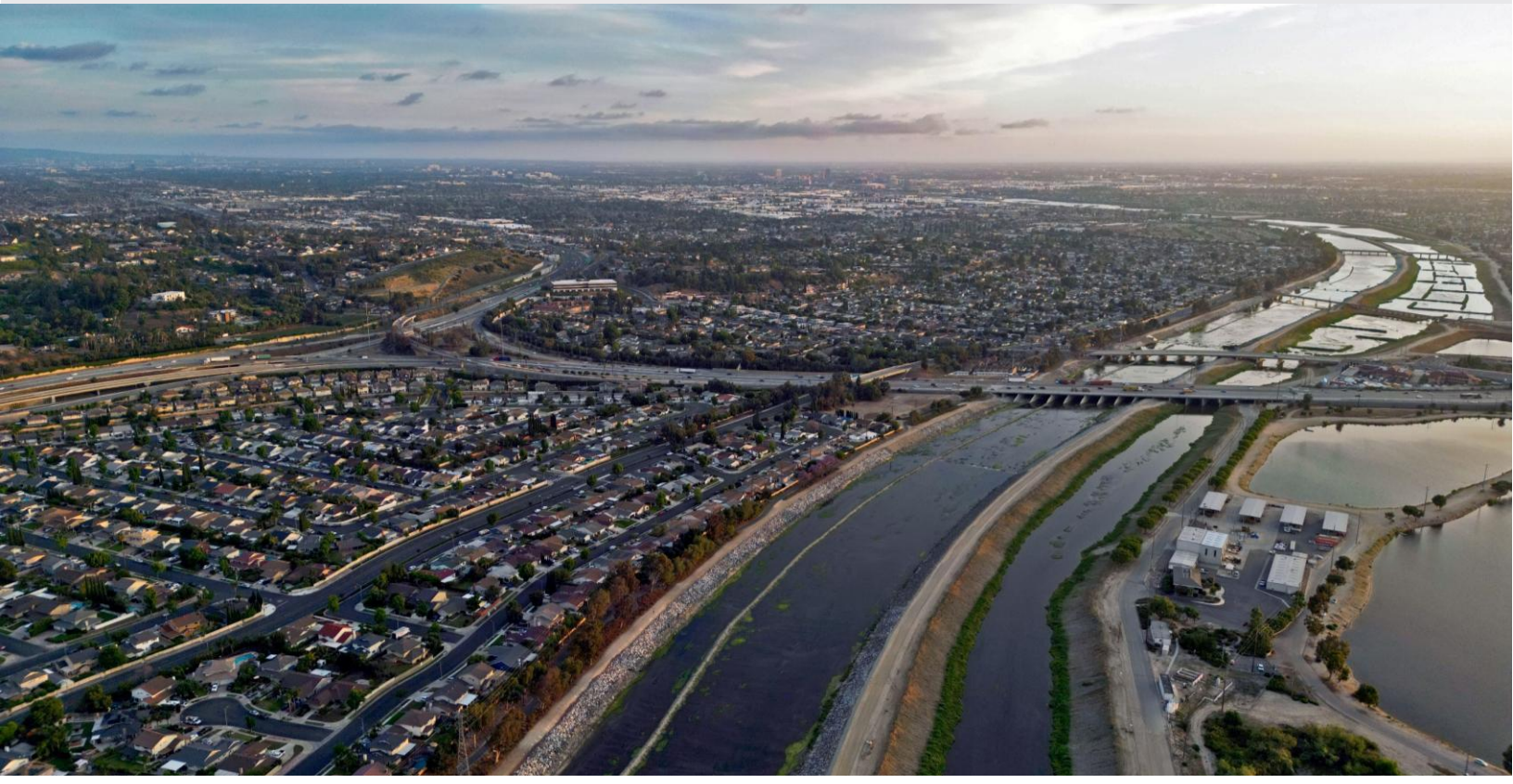
Floodplain Management Plan

Volume 2—Annexes



September 2026

TETRA TECH

Orange County Floodplain Management Plan

September 2026
#105IS045017

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1. UNINCORPORATED ORANGE COUNTY ANNEX

This jurisdictional annex document (annex) supplements Volume I of the Orange County Floodplain Management Plan (FMP) by providing jurisdiction-specific information for the unincorporated areas of the County. Furthermore, this annex provides information to assist public and private sectors within unincorporated areas with reducing losses from future hazard events. While this annex does not attempt to provide specific guidance of how to respond when a flooding disaster occurs, it will provide detailed flood mitigation actions that can be implemented prior to a disaster event in an effort to reduce, limit or eliminate negative impacts to life and property. The annex presents a general overview of Orange County's unincorporated areas, describes who participated in the planning process, assesses the flooding risk areas, vulnerability, capabilities, and outlines a strategy for achieving a more resilient community.

1.1 FLOODPLAIN MANAGEMENT PLANNING TEAM

Orange County Public Works identified primary and alternate FMP points of contact and developed this plan over the course of several months, with input from many County departments. Orange County Public Works, Flood Programs represented the unincorporated portions of the County on the Orange County FMP Planning Partnership and supported the local planning process by securing input from persons with specific knowledge to enhance the plan. All departments were asked to contribute to the annex development through reviewing and contributing to the capability assessment, reporting on the status of previously identified actions, and participating in action identification and prioritization.

Table 1-1 provides those County officials who participated in the development of the annex and in what capacity. Additional documentation of the County's planning activities through Planning Partnership meetings is included in Volume I.

Table 1-1. Floodplain Management Planning Team

Primary Point of Contact	Alternate Point of Contact
Name/Title: Joyce Drysdale, PE Orange County Public Works | Civil Engineer Address: 601 N. Ross St. Santa Ana, CA 92701 Phone Number: 657-248-6350 Email: Joyce.Drysdale@pw.oc.gov	Name/Title: Giatho Tran, PE Orange County Public Works | Sr. Civil Engineer Address: 601 N. Ross St. Santa Ana, CA 92701 Phone Number: 949-241-1509 Email: Giatho.Tran@pw.oc.gov
National Flood Insurance Program Floodplain Administrator	
Name/Title: Director of OC Public Works or Designee Address: 601 North Ross Street, Santa Ana, CA 92701 Phone Number: (714) 667-8800 Email: N/A	

1.2 COMMUNITY PROFILE

1.2.1 Brief History

Unincorporated areas in Orange County, California, have a unique history shaped by the region's development and urbanization. Initially, these areas were part of larger ranchos and agricultural lands in the 19th and early 20th centuries. As cities began to incorporate and expand, pockets of unincorporated land remained, often due to their

rural nature or the preferences of residents (OC LAFCO 2025). Over the past few decades, efforts have been made to annex these areas into neighboring cities to improve service delivery and governance. Despite these efforts, several unincorporated communities still exist, each with its own distinct character and history (Enjoy OC 2024).

1.2.2 Location

Unincorporated areas in Orange County are scattered throughout the region, often surrounded by incorporated cities (OC LAFCO 2025). These areas include diverse communities such as Coto de Caza, Ladera Ranch, and North Tustin. They are typically characterized by their rural or suburban settings and often maintain a distinct identity separate from nearby cities (Enjoy OC 2024). Despite being unincorporated, these areas benefit from county services and have unique demographic profiles.

1.2.3 Governing Body Format

Unincorporated areas in Orange County are governed directly by the County of Orange rather than by a city council (OC LAFCO 2025). The Orange County Board of Supervisors, consisting of five elected members, serves as the legislative and executive body for these areas. The Board sets policies, enacts ordinances, and oversees the county's budget and services. Additionally, various county departments manage day-to-day operations, including public works, law enforcement, and planning (OCDS 2015). This structure ensures that residents of unincorporated areas receive essential services and representation at the county level (OC LAFCO 2025).

1.2.4 Population and Social Vulnerability

According to the U.S. Census, the 2020 population for Unincorporated Orange County was 132,877. This is 14.3-percent of the participating jurisdiction population total.

Research has shown that some populations are at greater risk from hazard events because of decreased resources or physical abilities. These populations can be more susceptible to hazard events based on a number of factors including their physical and financial ability to react or respond during a hazard, and the location and construction quality of their housing. Data from the American Community Survey 5-Year Population Estimates indicates that 5.5 percent of the population is 5 years of age or younger, 15.4 percent is 65 years of age or older, 5.2 percent is non-English speaking, 6.1 percent is below the poverty threshold, and 8.0 percent is considered disabled.

1.3 JURISDICTIONAL CAPABILITY ASSESSMENT AND INTEGRATION

Orange County Public Works performed an inventory and analysis of existing capabilities, plans, programs, and policies that enhance its ability to implement mitigation strategies. Volume I describes the components included in the capability assessment and their significance for floodplain management planning. The jurisdictional assessment for this annex includes analyses of the following:

- Planning and regulatory capabilities
- Development and permitting capabilities
- Administrative and technical capabilities
- Fiscal capabilities

- Education and outreach capabilities
- Classification under various community mitigation programs
- Adaptive capacity to withstand hazard events

For a community to succeed in reducing long-term risk, floodplain management must be integrated into day-to-day local government operations. As part of the floodplain management analysis, planning documents were reviewed and each jurisdiction was surveyed to obtain a better understanding of their progress toward plan integration. Development of an updated mitigation strategy provided an opportunity for Orange County to identify opportunities for integrating mitigation concepts into ongoing County procedures.

1.3.1 Planning and Regulatory Capability and Integration

Table 1-2 summarizes the planning and regulatory tools that are available to unincorporated Orange County.

Table 1-2. Planning and Regulatory Capability and Integration

	Jurisdiction has this?	Citation and Date (code chapter or name of plan, date of enactment or plan adoption)	Authority (local, county, state, federal)	Responsible Person, Department or Agency
CODES, ORDINANCES, & REGULATIONS				
Building Code	Yes	O-22-004; Sec. 7-1-12; Adoption of CA Building Code, IBC, and CA Res., Energy, Green Bldg. Standards, Hist. Bldg., And Existing.	County via adoption of State Code	OC Public Works
How does this reduce risk from flood-related hazards? State Building Code Requires Community to Document date of NFIP entrance, and date of first FIRM.				
Zoning/Land Use Code	Yes	O-20-006; Sec. 7-9-25 – Zones and Districts; 7-9-42 – FP Overlay District; 7-9-42.3 – Application	County	OC Public Works
How does this reduce risk from flood-related hazards? 7-9-42.3(f) – Without a regulatory floodway, prohibits all forms of development within FIRM Zones A1-A30 and AE, unless an effective 1 foot above base flood elevation no-rise in water surface elevation is demonstrated post construction. 7-9-42.3(g) – Required Dry-Floodproofing for non-residential new construction or SI in FP District; Required Wet-Floodproofing for residential new construction and SI in FP District. 7-9-42.6 (a) – Adds flood protection construction standards to those uses permitted by a Site Development Permit (SDP) within "A," "A1" through "A30," "AO," "AE," "AH," "A99" and “M” zones (i.e., F2 Overlay) 7-9-42.6 (b) – For SDP Uses provided in item (a) within "V" and "V1" through "V30", and "VE” Zones, further stipulates needing to meet Coastal Floodplain Development Study criteria, as well a variety of additional design standards, all required to have certification from a State licensed professional engineer or architect. 7-9-42.8 – lists uses and activities expressly prohibited in FP Overlay Districts, specifically those that would increase base flood elevations, increase rates of erosion, and otherwise increase risk to life, safety, and property by exacerbating impacts from floodwaters. 7-9-42.9 – Stipulates eleven enhanced (11) SDP application requirements for uses in the FP Overlay District, all of which require certification by a State licensed professional engineer or architect. Stipulations include but not limited to the SDP application, include drainage study and plans showing grading and water conveyance, a valid and complete EC with showing planned lowest level one-foot (1 ft.) above the base flood elevation, and that all Federal Sect. 404 permits have been received.				

	Jurisdiction has this?	Citation and Date (code chapter or name of plan, date of enactment or plan adoption)	Authority (local, county, state, federal)	Responsible Person, Department or Agency
Subdivision Code	Yes	Sec. 7-9-282. Drainage & Erosion Control; Sec. 7-9-290. Dangerous Areas to be Removed or Controlled. Sec. 7-9-292. Floodplain. Sec. 7-9-295. Dedications.	County	OC Public Works

How does this reduce risk from flood-related hazards?

Sub-sec. 282: Requires that existing or proposed flood control channels be examined with respect to the official flood control plan for the County, and if those channels are within or adjacent to the subdivision, it must be shown, dimensioned and aligned with said flood control plan.

Sub-sec. 290: Prohibits platting of flood hazard areas and associated subdivision approval unless Subdivision committee is satisfied [flood] hazards are removed or risk to surrounding uses and properties is mitigated from those risks. Subdivision regulations trigger a required flood protection meeting for all proposed subdivisions in the FP Overlay District(s), which include the submission of flood elevation data and requisite engineering studies.

Sub-sec. 292: Stipulates that subdivisions may not be approved until all utility and infrastructure systems serving proposed subdivision are shown to be designed to minimize impacts to them from flooding and structurally withstand hydrodynamic forces or loads.

Sub-sec. 295: Stipulates that Subdivision Committee *may* require public dedications for Flood-Control Facilities prior to plats being approved. Language is discretionary (*may*), but still underscores the importance placed on flood control facilities and from a regulatory stance, views flood control facilities as a public use and / or needed for public benefit.

Site Plan Code	Yes	See Zoning Code For Site Development Permit (SDP) Requirements For Development In FP Overlay	County	OC Public Works

How does this reduce risk from flood-related hazards?
This code ensures orderly development, promotes public health and safety. It also protects the environment by regulating land use, building placement, and infrastructure requirements.

Stormwater Management Code	Yes	Sec. 9-1-50(a): Stormwater Management Code	County	OC Public Works

How does this reduce risk from flood-related hazards?
Sec. 9-1-50(a): All new developments and significant redevelopment must comply with Drainage Area Mngt. Plan (DAMP). SWM Code addresses illicit discharges into the drainage system under regulatory purview of the National Pollutant Discharge Elimination System (NPDES). While the NPDES program is a water quality program development by the U.S. Environmental Protection Agency, flood risk benefits from this program include enhanced maintenance and stability of the drainage conveyance system as a whole.

Post-Disaster Recovery/ Reconstruction Code	NA	-	-	-

How does this reduce risk from flood-related hazards?

	Jurisdiction has this?	Citation and Date (code chapter or name of plan, date of enactment or plan adoption)	Authority (local, county, state, federal)	Responsible Person, Department or Agency
Real Estate Disclosure Requirements	Yes	CA Gov. Code Sec. 8589.3 – Natural Hazard Disclosure Questionnaire Requirement	State of CA	CA Department of Real Estate (DRE)
How does this reduce risk from flood-related hazards? Informs buyers of real property of flood related risks by requiring sellers to disclose if a property or a portion thereof is within a FEMA SFHA.				
Growth Management	Yes	Sec. 7-9-47.2. - General provisions and regulations	County	OC Public Works
How does this reduce risk from flood-related hazards? This code ensures consistency and precision in the interpretation and application of the Comprehensive Zoning Code.				
Flood Damage Prevention Ordinance	Yes	Sec. 7-9-42. - FP "Floodplain" Overlay District	County	OC Public Works
How does this reduce risk from flood-related hazards? This code ensures compliance with the National Flood Insurance Program (NFIP) and the Community Rating System (CRS) and reduces flood risks by providing flood insurance discounts to property owners.				
Wellhead Protection	Yes	Sec. 7-8-34. - Drilling and operating	County	OC Public Works
How does this reduce risk from flood-related hazards? This code regulates the drilling and operation of oil wells to ensure these activities are conducted safely and with other land uses, and protecting public health, safety, and welfare.				
Emergency Management Ordinance	Yes	Sec. 3-1-3. - County of Orange Emergency Management Council	County	OC Public Works
How does this reduce risk from flood-related hazards? This code establishes the Emergency Management Council to coordinate and oversee emergency preparedness, response, and recovery efforts within the County.				
Climate Change Ordinance	NA	-	-	-
How does this reduce risk from flood-related hazards?				
Other	NA	-	-	-
How does this reduce risk from flood-related hazards?				
PLANNING DOCUMENTS				
Comprehensive/ Master Plan	Yes	Orange County General Plan, June 2024	County	OC Public Works, OC Development Services
How does this reduce risk from flood-related hazards? The Plan provides a strategic framework for sustainable and organized development, guiding land use, infrastructure, and economic growth to enhance County quality of life and ensure long-term viability.				

	Jurisdiction has this?	Citation and Date (code chapter or name of plan, date of enactment or plan adoption)	Authority (local, county, state, federal)	Responsible Person, Department or Agency
Capital Improvement Plan	Yes	OC Public Works Capital Improvement Program; CIP, July 1, 2025	County	OC Public Works
How does this reduce risk from flood-related hazards? The CIP outlines and prioritizes the County's infrastructure and facility projects, ensuring efficient allocation of resources to maintain and enhance public services and community well-being.				
Disaster Debris Management Plan	Yes	County of Orange Disaster Debris Management Plan, 2025	County	Orange County Sheriff's Department, Emergency Management Division
How does this reduce risk from flood-related hazards? This plan provides coordinated procedures for the rapid removal of debris from waterways, storm drains, and flood-prone areas after disasters, helping to prevent blockages, maintain drainage capacity, and reduce the likelihood and severity of flooding.				
Floodplain Management or Watershed Plan	NA	-	-	-
How does this reduce risk from flood-related hazards?				
Stormwater Management Plan	NA	-	-	-
How does this reduce risk from flood-related hazards?				
Open Space Plan	NA	-	-	-
How does this reduce risk from flood-related hazards?				
Urban Water Management Plan	NA	-	-	-
How does this reduce risk from flood-related hazards?				

	Jurisdiction has this?	Citation and Date (code chapter or name of plan, date of enactment or plan adoption)	Authority (local, county, state, federal)	Responsible Person, Department or Agency
Habitat Conservation Plan(s)	Yes	Orange Central/Coastal Natural Community Conservation Plan (NCCP) & Habitat Conservation Plan (HCP), July 1996 (https://occonservation.org/about-ncc/ see also: https://wildlife.ca.gov/Conservation/Planning/NCCP/Plans/Orange-Coastal) Southern Sub-Regional Natural Community Conservation Plan/Master Streambed Alteration Agreement/Habitat Conservation Plan, July 2006 (https://ocgov.box.com/s/pr4f0nojs1n1y6qqx73b6vwm8njas3m6) Upper Santa Ana River Wash Habitat Conservation Plan, 1997 [NOTE: physically located in another county but County of Orange is a local sponsor with San Bernardino County and Riverside County] (https://www.sbvwcd.org/santa-ana-wash-plan/)	County	Other entities, but for County of Orange, OC Public Works – Regulatory Permits group

How does this reduce risk from flood-related hazards?
A Habitat Conservation Plan explains and recommends actions to protect rare, threatened, or endangered aquatic or riparian species.

Habitat Protection/ Restoration Plan(s)	Yes	Peters Canyon Regional Park Resource Management Plan, July 2019 (https://www.ocparks.com/sites/ocparks/files/import/data/files/103009.pdf) Peters Canyon Regional Park General Development Plan, July 2019 (https://www.ocparks.com/sites/ocparks/files/import/data/files/103008.pdf) Aliso and Wood Canyons Wilderness Park Resource Management Plan, August 2009 (https://www.ocparks.com/sites/ocparks/files/import/data/files/22978.pdf) Laguna Coast Wilderness Park Resource Management Plan, September 1998 (https://www.ocparks.com/sites/ocparks/files/2022-04/Laguna%20Coast%20Wilderness%20Park%20RMP%20%28September%201998%29_orig_0.pdf) Talbert Regional Park Master Plan, 1st Draft January 2025 (https://ocparks.com/sites/ocparks/files/2025-01/Talbert%20Regional%20Park%20Master%20Plan%20First%20Draft_01_13_2025.pdf)	Local and County	OC Parks

How does this reduce risk from flood-related hazards?
A Habitat Protection/Restoration Plan identifies critical habitat within the floodplain, actions to protect remaining habitat, and/or actions to restore fully functioning habitat. Frequently this will result in the preservation and/or restoration of riparian habitat that is necessary for water-dependent species.

	Jurisdiction has this?	Citation and Date (code chapter or name of plan, date of enactment or plan adoption)	Authority (local, county, state, federal)	Responsible Person, Department or Agency
Green Infrastructure Plan	NA	-	-	-
How does this reduce risk from flood-related hazards? N/A				
Comprehensive/ Community Plan	NA	-	-	-
How does this reduce risk from flood-related hazards? N/A				
Economic Development Plan	NA	-	-	-
How does this reduce risk from flood-related hazards?				
Community Wildfire Protection Plan	NA	-	-	-
How does this reduce risk from flood-related hazards?				
Transportation Plan	NA	-	-	-
How does this reduce risk from flood-related hazards?				
Agriculture Plan	NA	-	-	-
How does this reduce risk from flood-related hazards?				
Climate Action/ Resilience/Sustainability Plan	Yes	Climate Action Plan, 2024 (https://oclandfills.com/sites/ocwr/files/2024-09/Final_Preliminary_CAP.pdf) Climate Action Plan Phase 2, 2026 (https://oclandfills.com/sites/ocwr/files/2026-01/FINAL-CAP-PHASE%202-%202026-County-Orange-04a-DIGITAL.pdf)	County	OC Parks
How does this reduce risk from flood-related hazards? This plan provides a framework for reducing greenhouse gas emissions, enhancing climate resilience, and supporting public health, environmental sustainability, and economic benefits through coordinated actions across County operations and unincorporated communities.				
Tourism Plan	NA	-	-	-
How does this reduce risk from flood-related hazards?				
Business/ Downtown Development Plan	NA	-	-	-
How does this reduce risk from flood-related hazards?				

	Jurisdiction has this?	Citation and Date (code chapter or name of plan, date of enactment or plan adoption)	Authority (local, county, state, federal)	Responsible Person, Department or Agency
Other	Yes	Upper Newport Bay Nature Preserve (https://www.ocparks.com/parks-trails/upper-newport-bay-nature-preserve)	State and County	OC Parks
How does this reduce risk from flood-related hazards? Managed by OC Parks; this is composed of the bluffs surrounding the Upper Newport Bay Ecological Preserve managed by CA DFW.				
RESPONSE/RECOVERY PLANNING				
Emergency Operations Plan	Yes	Orange County Emergency Operations Plan, January 2019	County	Orange County Sheriff's Department, Emergency Management Division
How does this reduce risk from flood-related hazards? This plan provides a coordinated framework for preparing, responding to, and recovering from emergencies and disasters within Orange County.				
Continuity of Operations Plan	Yes	Orange County Continuity of Operations Plan (COOP), 2023	County	Orange County Sheriff's Department, Emergency Management Division
How does this reduce risk from flood-related hazards? This plan ensures that essential functions and services of Orange County can continue during and after emergencies and disruptions.				
Substantial Damage Response Plan	Yes	County of Orange and Orange County Operational Area Flood, Dam and Reservoir Failure Annex, February 2026	County	Orange County Sheriff's Department, Emergency Management Division
How does this reduce risk from flood-related hazards? This annex establishes a coordinated framework for preparing for, responding to, and recovering from flood, dam failure, and reservoir failure emergencies, helping protect lives, property, critical infrastructure, and public safety throughout Orange County.				
Threat and Hazard Identification and Risk Assessment	Yes	Risk, Threat, and Hazard Analysis Process, 2023	County	Orange County Sheriff's Department, Emergency Management Division
How does this reduce risk from flood-related hazards? This plan identifies and assesses the natural, technological, and human-caused hazards that could affect Orange County, evaluate their potential impacts, and help prioritize preparedness, mitigation, response, and recovery efforts to strengthen community resilience and reduce risk.				

	Jurisdiction has this?	Citation and Date (code chapter or name of plan, date of enactment or plan adoption)	Authority (local, county, state, federal)	Responsible Person, Department or Agency
Post-Disaster Recovery Plan	Yes	County of Orange and Orange County Operational Area Recovery Plan, November 2023	County	Orange County Sheriff's Department, Emergency Management Division
How does this reduce risk from flood-related hazards? This plan provides a coordinated framework for government agencies, community organizations, and stakeholders to support short-term and long-term recovery efforts following disasters, helping Orange County restore infrastructure, services, housing, and community functions as efficiently as possible.				
Other	NA	-	-	-
How does this reduce risk from flood-related hazards?				

1.3.2 Development and Permitting Capability

Table 1-3 summarizes the capabilities of unincorporated Orange County to oversee and track development.

Table 1-3. Development and Permitting Capability

	Yes/No	Comment
Do you issue development permits? • **If you issue development permits, what department is responsible?** • **If you do not issue development permits, what is your process for tracking new development?**	Yes	Orange County Development Services issues development permits.
Are permits tracked by hazard area? (For example, floodplain development permits.)	Yes	Permits in the floodplain are tracked by Development Services in OC Public Works.
Do you have a buildable land inventory? • **If you have a buildable land inventory, please describe**	No	-
Describe the level of buildout in your jurisdiction.	-	The County is almost entirely built out. There are some portions of the unincorporated areas that are undeveloped.

1.3.3 Administrative and Technical Capability

Table 1-4 summarizes potential staff and personnel resources available to unincorporated Orange County and their current responsibilities that contribute to floodplain management.

Table 1-4. Administrative and Technical Capabilities

Resources	Available?	Comment
ADMINISTRATIVE CAPABILITY		
Planning Board	Yes	OC Development Services
Zoning Board of Adjustment	Yes	Zoning Administrator at OC Public Works
Planning Department	Yes	OC Development Services
Mitigation Planning Committee	Yes	Mitigation Planning Committee
Environmental Board/Commission	Yes	Orange County Waste Management Commission OC Office of Sustainability
Open Space Board/Committee	Yes	OC Parks
Economic Development Commission/Committee	Yes	Orange County Business Council (OCBC) OC Workforce & Economic Development Division
Public Works/Highway Department	Yes	OC Public Works
Construction/Building/Code Enforcement Department	Yes	Building and Safety Division within the Orange County Public Works.
Emergency Management/Public Safety Department	Yes	Emergency Management Division within the Orange County Sheriff's Department
Maintenance programs to reduce risk (stormwater maintenance, tree trimming, etc.)	No	Operations & Maintenance Services, OC Public Works
Mutual aid agreements	Yes	Emergency Management Division within Orange County Sheriff's Department; OC Fire Authority
Human Resources Manual - Do any job descriptions specifically include identifying or implementing mitigation projects or other efforts to reduce natural hazard risk?	No	-
Other	No	-
TECHNICAL/STAFFING CAPABILITY		
Planners or engineers with knowledge of land development and land management practices	Yes	OC Public Works
Engineers or professionals trained in building or infrastructure construction practices	Yes	Building and Safety Division within OC Public Works
Planners or engineers with an understanding of natural hazards	Yes	OC Public Works
Staff with expertise or training in benefit/cost analysis	No	-
Professionals trained in conducting damage assessments	Yes	Orange County Sheriff's Department, Emergency Management Division in coordination with other relevant departments such as OC Public Works and OC Development Services
Personnel skilled or trained in GIS and/or Hazus applications	Yes	OC Public Works
Staff that work with socially vulnerable populations or underserved communities	Yes	OC Public Works

Resources	Available?	Comment
Public Information Officer	Yes	County Executive Office and OC Public Works have dedicated Public Information Managers / Officers.
Surveyors	Yes	OC Public Works
Emergency manager	Yes	Emergency Management Division Director within the Orange County Sheriff's Department and Emergency Management Program at OC Public Works
CRS Coordinator	Yes	CRS Coordinator, OC Public Works
Resilience Officer	No	-
Other (this could include stormwater engineer, environmental specialist, etc.)	Yes	OC Public Works

1.3.4 Fiscal Capability

Table 1-5 summarizes financial resources available to unincorporated Orange County.

Table 1-5. Fiscal Capabilities

Financial Resources	Accessible or Eligible to Use?
Community Development Block Grants (CDBG, CDBG-DR)	Yes – Eligible
Capital improvement project funding	Yes – Eligible
Authority to levy taxes for specific purposes	Yes – Eligible
User fees for water, sewer, gas, or electric service	Yes – Eligible
Impact fees for homebuyers or developers of new development/homes	Yes – Eligible
Stormwater utility fee	Yes – Eligible
Incur debt through general obligation bonds	Yes – Eligible
Incur debt through special tax bonds	Yes – Eligible
Incur debt through private activity bonds	Yes – Eligible
Withhold public expenditures in hazard-prone areas	Yes – Eligible
Other federal or state funding programs	Yes – Eligible
Open Space Acquisition funding programs	Yes – Eligible
Other (for example, Clean Water Act 319 Grants [Nonpoint Source Pollution])	No

1.3.5 Education and Outreach Capability

Table 1-6 summarizes the education and outreach resources available to unincorporated Orange County.

1.3.6 Community Classifications

Table 1-7 summarizes classifications for community programs available to unincorporated Orange County.

Table 1-6. Education and Outreach Capabilities

Outreach Resources	Available?	Comment
Public information officer or communications office	Yes	County Executive Office has a dedicated Public Information Manager
Personnel skilled or trained in website development	Yes	OC Public Works
Floodplain management information available on your website	Yes	OC Public Works
Social media for floodplain management education and outreach	Yes	YouTube and Facebook
Citizen boards or commissions that address issues related to floodplain management	Yes	City Engineer Flood Control Advisory Committee
Warning systems for hazard events	Yes	AlertOC
Natural disaster/safety programs in place for schools	No	-
Organizations that conduct outreach to socially vulnerable populations and underserved populations	Yes	OC Sheriff's Department
Public outreach mechanisms / programs to inform citizens on natural hazards, risk, and ways to protect themselves during such events	Yes	OC Public Works PIO

Table 1-7. Community Classifications

Program	Participating?	Classification	Date Classified
Community Rating System (CRS)	Yes	5	May 2017
Building Code Effectiveness Grading Schedule (BCEGS)	Yes	Class 3 Residential Class 2 Commercial	2023
Public Protection (ISO Fire Protection Classes 1 to 10)	Yes	Class 1	2024
National Weather Service StormReady Certification	Yes	StormReady	2024
National Weather Service TsunamiReady Certification	Yes	TsunamiReady	2024
Firewise Communities classification	No	Communities within OC are recognized	-
Other: Organizations with mitigation focus (advocacy group, non-government)	No	-	-

— = Unavailable

1.3.7 Adaptive Capacity

Adaptive capacity is defined as "the ability of systems, institutions, humans and other organisms to adjust to potential damage, to take advantage of opportunities, or respond to consequences" (IPCC 2022). Each jurisdiction has a unique combination of capabilities to adjust to, protect from, and withstand a future hazard event, future conditions, and changing risk. Table 1-8 summarizes the adaptive capacity for each identified hazard of concern and the County's capability to address related actions using the following classifications:

- Strong: Capacity exists and is in use.
- Moderate: Capacity might exist; but is not used or could use some improvement.
- Weak: Capacity does not exist or could use substantial improvement

Table 1-8. Adaptive Capacity

Hazard	Adaptive Capacity - Strong/Moderate/Weak
Flood	Moderate
Riverine Flood	Moderate
Coastal Flood	Weak
Sea Level Rise	Weak
Tsunami	Weak
Dam Failure	Weak

1.4 NATIONAL FLOOD INSURANCE PROGRAM COMPLIANCE

1.4.1 NFIP Statistics

Table 1-9 summarizes the NFIP policy and claim statistics for Orange County.

Table 1-9. Orange County NFIP Summary of Policy and Claim Statistics

# Claims (Losses)	37
Total Loss Payments	$1,362,201.00
# Repetitive Loss Properties (NFIP definition)	12
# Repetitive Loss Properties (FMA definition)	1
# Severe Repetitive Loss Properties (NFIP definition)	1
# Severe Repetitive Loss Properties (FMA definition)	1

NFIP Definition of Repetitive Loss: The NFIP defines a repetitive loss property as any insurable building for which two or more claims of more than $1,000 were paid by the NFIP within any rolling 10-year period since 1978.

FMA Definition of Repetitive Loss: FEMA's Flood Mitigation Assistance (FMA) program defines a repetitive loss property as any insurable building that has incurred flood-related damage on two occasions, in which the cost of the repair, on average, equaled or exceeded 25 percent of the market value of the structure at the time of each such flood event.

Definition of Severe Repetitive Loss: A residential property covered under an NFIP flood insurance policy and: (a) That has at least four NFIP claim payments over $5,000 each, and the cumulative amount of such claims payments exceeds $20,000; or (b) For which at least two separate claims payments have been made with the cumulative amount of the building portion of such claims exceeding the market value of the building. At least two of the claims must have occurred within any 10-year period, more than 10 days apart.

Source: FEMA, 2024.

1.4.2 Flood Vulnerability Summary

Table 1-10 provides a summary of the NFIP program in Orange County.

Table 1-10. NFIP Summary

NFIP Topic	Comments
FLOOD VULNERABILITY SUMMARY	
Describe areas prone to flooding in your jurisdiction.	Low lying areas of the unincorporated portions of the County are subject to flood risk.
Do you maintain a list of properties that have been damaged by flooding?	Yes, OC Public Works maintains a list of properties that have been repetitively damaged by flooding.
Do you maintain a list of property owners interested in flood mitigation?	County does not maintain a list of property owners interested in flood mitigation.
How many homeowners and/or business owners are interested in mitigation (elevation or acquisition)?	Unknown, at this time.
Are any RiskMAP projects currently underway in your jurisdiction? If so, state what projects are underway.	Yes, there has been a RiskMAP project in progress in the Huntington Beach area that started around 2020. This is in the East Garden Grove-Wintersburg region downstream of I-405.
How do you make Substantial Damage determinations?	Substantial Damage determinations are made if the cost of restoring the structure is greater or equal to 50% of the market value.
How many Substantial Damage determinations were declared for recent flood events in your jurisdiction?	Zero Substantial Damage determinations have been made for flood events in the last 5 years.
How many properties have been mitigated (elevation or acquisition) in your jurisdiction? If there are mitigation properties, how were the projects funded?	There have been no properties with elevation or acquisition mitigation within unincorporated Orange County.
Do your flood hazard maps adequately address the flood risk within your jurisdiction? If not, state why.	The flood hazard maps do not take into account non-riverine sources of flooding such as post-fire debris flows, which may impact areas that are not within the SFHA.
NFIP COMPLIANCE	
What local department is responsible for floodplain management?	OC Public Works is responsible for floodplain management.
Are any certified floodplain managers (CFM) on staff in your jurisdiction?	Currently, no CFM's within OC Public Works.
Do you have access to resources to determine possible future flooding conditions from climate change?	The Hydrology group is working on an update to the Hydrology Manual which is planned to include some information on climate change. Additionally, the County prepared a Preliminary Climate Action Plan and a Climate Action Plan Phase 2 that lists Action Items that the County could implement to support climate change resiliency (https://oclandfills.com/sites/ocwr/files/2024-09/Final_Preliminary_CAP.pdf) (https://oclandfills.com/sites/ocwr/files/2026-01/FINAL-CAP-PHASE%202-%202026-County-Orange-04a-DIGITAL.pdf)
Does your floodplain management staff need any assistance or training to support its floodplain management program? If so, what type of assistance/training is needed?	Additional training on floodplain management is welcome, and we try to attend trainings from ASFPM and FEMA when we can.
Provide an explanation of NFIP administration services you provide (e.g., permit review, GIS, education/outreach, inspections, engineering capability)	The Development Services service area provides permit review and permits inspection and maintains Elevation Certificates. The Survey service area provides GIS and mapping support, while the O&M service area provides maintenance inspections and repairs. The Infrastructure Programs service area

NFIP Topic	Comments
	provides floodplain management and administration services, including education, outreach, and engineering review.
How do you determine if proposed development on an existing structure would qualify as a substantial improvement?	Substantial improvement determinations are made if the cost of improvement divided by the market value is greater or equal to 50%.
What are the barriers to running an effective NFIP program in the community, if any?	There are no barriers at this time to running an effective NFIP program in the community.
Does your jurisdiction have any outstanding NFIP compliance violations that need to be addressed? If so, state the violations.	None.
When was the most recent Community Assistance Visit (CAV) or Community Assistance Contact (CAC)?	June 2020.
What is the local law number or municipal code of your flood damage prevention ordinance?	Orange County, CA, Title 7 – Land Use and Building Regulations, Division 9 – Planning, Article 2 – The Comprehensive Zoning Code, Subarticle 3 – Overlay, Combining, and Other Districts, Sec 7-9-42 FP "Floodplain" Overlay District
What is the date that your flood damage prevention ordinance was last amended?	May 2025
Does your floodplain management program meet or exceed minimum requirements? If exceeds, in what ways?	County floodplain management program exceeds the minimum requirements in the NFIP due to our participation in the CRS program. The County has adopted the 1-foot freeboard prerequisite in the zoning code to assist in maintaining the Class 5 CRS rating.
Are there other local ordinances, plans or programs (e.g., site plan review) that support floodplain management and meeting the NFIP requirements? For instance, does the planning board or zoning board consider efforts to reduce flood risk when reviewing variances such as height restrictions?	County local zoning code supports floodplain management and exceeds the NFIP requirements.
Does your community plan to join the CRS program or is your community interested in improving your CRS classification?	The County is currently in the CRS program. The County would be interested in improving our classification but we may not meet the Class 4 prerequisites.

1.5 GROWTH/DEVELOPMENT TRENDS

Understanding how past, current, and projected development patterns have or are likely to increase or decrease risk in hazard areas is a key component to appreciating a jurisdiction's overall risk to its hazards of concern. Recent and expected future development trends, including major residential/commercial development and major infrastructure development, are summarized in Table 1-11 through Table 1-13.

Table 1-11. Number of Building Permits for New Construction Issued Since 2020

	New Construction Permits Issued			
	Single Family	Multi-Family	Other (commercial, mixed-use, etc.)	Total
2020				
Total Permits	165	12	0	177
Permits within SFHA	0	0	1	1
2021				
Total Permits	120	23	0	155
Permits within SFHA	0	0	0	0
2022				
Total Permits	320	78	0	398
Permits within SFHA	0	0	0	0
2023				
Total Permits	452	99	0	551
Permits within SFHA	0	0	0	0
2024				
Total Permits	313	48	0	361
Permits within SFHA	0	0	0	0

SFHA = Special Flood Hazard Area (1% flood event)

Table 1-12. Recent Major Development and Infrastructure from 2020 to Present

Property or Development Name	Type of Development	# of Units / Structures	Location (address and/or block and lot)	Known Hazard Zones*	Description / Status of Development
Rancho Mission Viejo Planned Community	Residential	14,000	Southeastern Orange County	Wildland urban interface/ fire hazard severity zone	14,000 unit planned development. Construction commenced in 2012. To date, permits for 6,164 units have been issued and a certificate of occupancy has been issued for 5,172 of those units. Expected completion by 2034. The grand opening for Planning Area 3.3 occurred in June 2025 for 175 units and the grand opening of Planning Area 3.4 occurred in January 2026 for 326 units.
Cielo Vista	Residential	80	Northern Orange County (City of Yorba Linda SOI) Patrones Parkway	None	Under construction with expected completion in 2026.
Saddlecrest	Residential	65	East of Santiago Canyon Road	None	Under construction with expected completion in 2026.

Property or Development Name	Type of Development	# of Units / Structures	Location (address and/or block and lot)	Known Hazard Zones*	Description / Status of Development
American Family Housing Casa Paloma	Residential	71	15162 Jackson St, Midway City, CA 92655 (APNs 107-180-11 & 107-180-23)	None	Apartment complex with 69 affordable units and 2 manager's units. Completed in 2022.
Casa Colibri	Residential	65	15081 Jackson St, Midway City, CA 92655 (APN 107-151-36)	None	Apartment complex with 63 affordable units and 2 manager's units. Under construction with expected completion in 2026.

* Known hazard zones may include the 1% or 0.2% annual chance floodplain, wildland urban interface, fire hazard severity zone, dam inundation area, avalanche zone, or landslide susceptibility area.

Table 1-13. Known or Anticipated Major Development and Infrastructure in the Next Five Years

Property or Development Name	Type of Development	# of Units / Structures	Location (address and/or block and lot)	Known Hazard Zones*	Description / Status of Development
Esperanza Hills Specific Plan	Residential	340	Northern Orange County (City of Yorba Linda SOI)	None	Entitlement approved, processing building permits. Original expected completion in 2028, but most likely will not be completed within the specified timeframe.
Saddleback	Residential	181	East of El Toro Road	Wildland urban interface/fire hazard severity zone	Board of Supervisors approved the Final Tract Map. Use permit to establish site development standards is currently being processed. No estimated construction dates at this time.

* Known hazard zones may include the 1% or 0.2% annual chance floodplain, wildland urban interface, fire hazard severity zone, dam inundation area, avalanche zone, or landslide susceptibility area.

1.6 JURISDICTIONAL RISK ASSESSMENT

The hazard profiles in Volume I provide detailed information regarding each planning partner's vulnerability to the identified hazards, including summaries of Orange County's risk assessment results and data used to determine the hazard ranking. Key local risk assessment information is presented below.

1.6.1 Hazard Area

Maps of hazard areas in the County are shown in Figure 1-1 and Figure 1-2. These maps are based on the best available data at the time of the preparation of this plan and are adequate for planning purposes. Maps are provided only for hazards that can be identified clearly using mapping techniques and technologies and for which Orange County has significant exposure. The maps show the location of potential new development, where available.

Figure 1-1. Unincorporated Orange County Dam Inundation and FEMA Flood Hazard Area Extent and Location Map

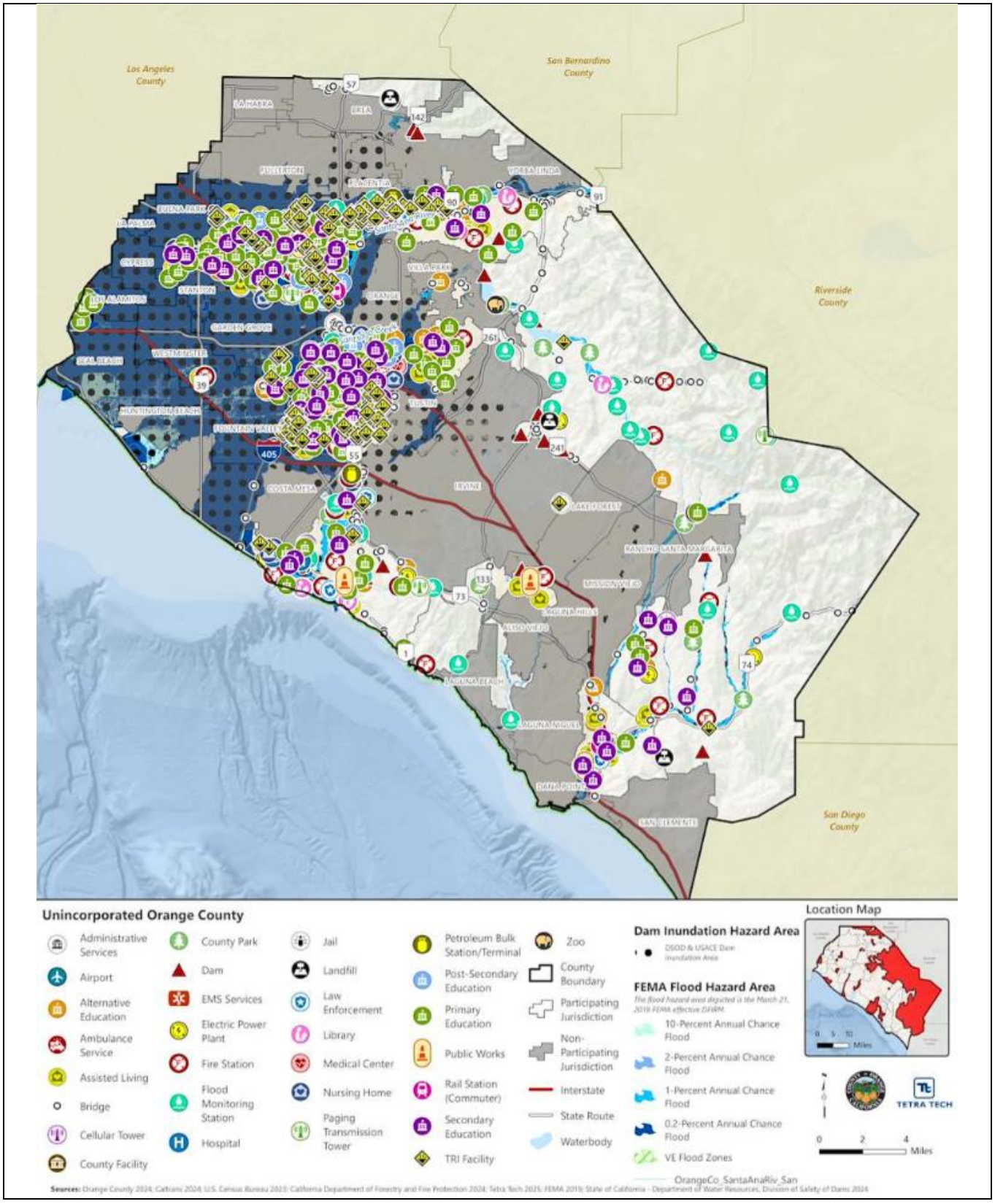
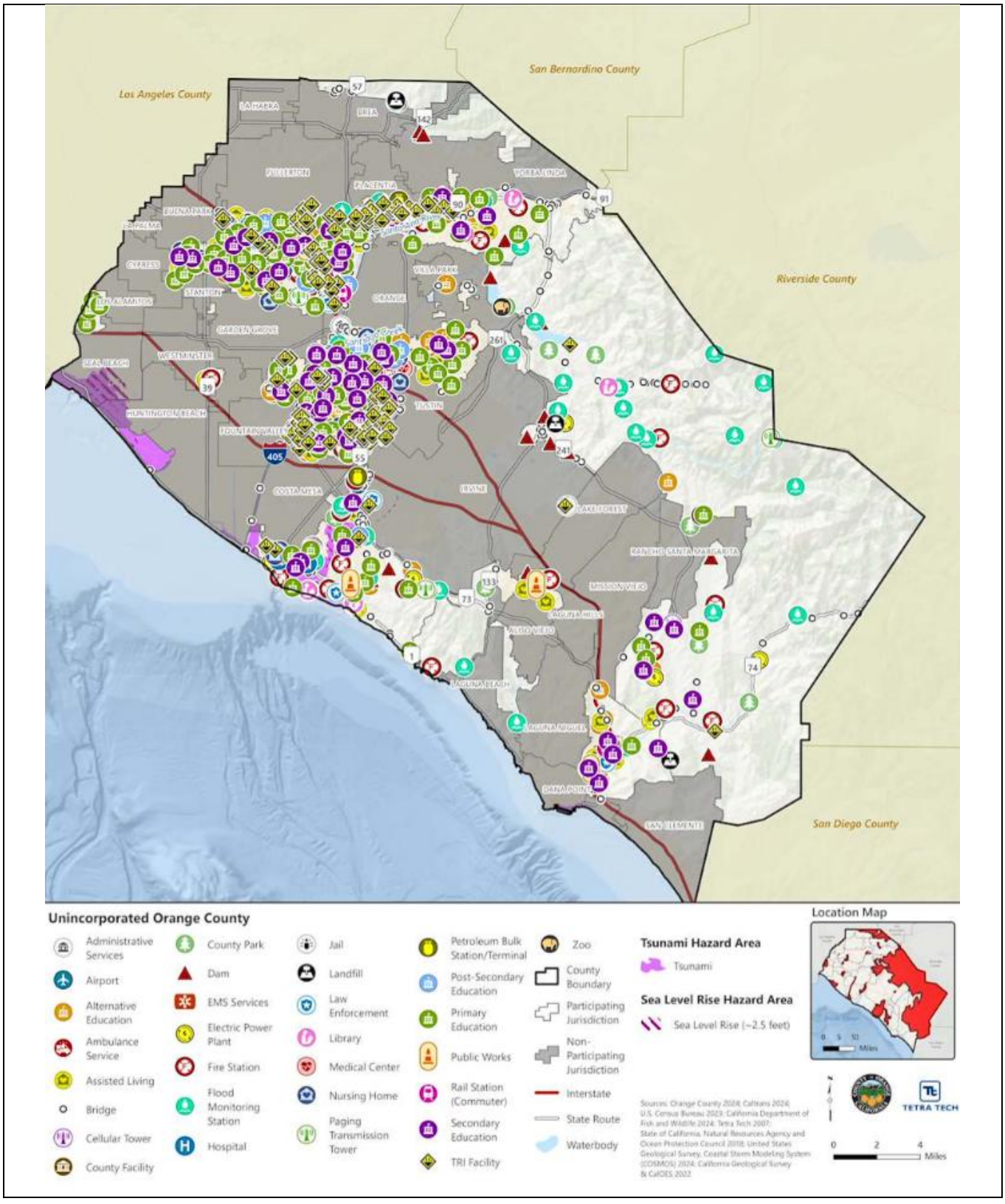


Figure 1-2. Unincorporated Orange County Tsunami and Sea Level Rise Hazard Area Extent and Location Map



1.6.2 Hazard Event History

The history of natural and non-natural hazard events in Orange County is detailed in Volume I, where each hazard profile includes a chronology of historical events that have affected the County and its municipalities. Table 1-14 provides details on loss and damage in Orange County during hazard events since 2015.

Table 1-14. Hazard Event History in Orange County

Dates of Event	Event Type (Disaster Declaration)	Summary of Event	Summary of Damage and Losses in Unincorporated Orange County
September 16, 2015	-	An 8.3 magnitude earthquake off Chile's coast on the 16th prompted a tsunami advisory from Orange County to north of San Luis Obispo. Beaches, harbors, piers, and marinas in several cities, including Seal Beach and Huntington Beach, were closed through the 17th. Tsunami waves under one foot were observed along the Orange County coast. The Orange County EOC reported no significant flooding but warned of strong currents and dangerous waves.	No major damages were reported by the County.
January 18, 2017 – January 23, 2017	DR-4305-CA	Severe winter storm, mudslides, and flooding occurred throughout the region. Water damage and disruptions were seen in the County.	Multiple locations of mudslides, trees down, vac truck and hand crew drain clearing throughout the canyons. Heavy equipment cleared debris behind silt boards in the canyons. Debris removal in Peters Canyon Retarding Basin Total Cost Estimate for County of Orange: $2.96M
January 22, 2017	-	Heavy rain caused flash flooding across Orange County, resulting in $100,000 in property damages. A water rescue took place on Hamilton Ave. at the Santa Ana River in Huntington Beach. Streets from Sunset Beach to Santa Ana to Newport Beach were flooded with 1-3 feet of water. Many vehicles were stranded in floodwaters, including several along Highway 55.	No major damages were reported by the County.
February 17, 2017	-	Flood waters from the East Garden Grove-Wintersburg Channel overflowed, causing $50,000 in property damages and flooding a mobile home park.	No major damages were reported by the County.
May 24, 2017	-	High tides of 6.5 feet caused minor street flooding and $10,000 in property damages on Balboa Island, with some water entering houses near 36th and Finley Streets. The flooding was exacerbated by the recent demolition of a protective sea wall.	No major damages were reported by the County.

Dates of Event	Event Type (Disaster Declaration)	Summary of Event	Summary of Damage and Losses in Unincorporated Orange County
October 7, 2017	-	Lifeguards reported 6-8 ft surf on the 7th and 8th in Newport and Huntington Beach, with peak waves of 15 ft at the Wedge. Coastal flooding during high tide on the Balboa Peninsula in Newport Beach caused $25,000 in property damages. The beach parking lot, nearby streets, and homes were flooded, and several cars were swamped. In Capistrano Beach, large waves shattered a window in a home.	No major damages were reported by the County.
February 13, 2019	CDAA – DSR#3528	Flash flooding occurred in Laguna Beach with up to 2 inches of rain in 3 hours inundated storm channels, causing $80,000 in property damages. Streets were closed, and homes were threatened by the rising waters.	Multiple locations of mudslides, trees down, vac truck and hand crew drain clearing throughout the canyons. CO2 had significant slope erosion reported C04 had multiple failures reported E02, F08, I02, L01, C01, C05, F07, C03, C01S01 all had multiple issues reported Tonner Canyon mud slide Total Cost Estimate for County of Orange: $9.69M
April 6, 2020	-	Heavy rainfall occurred in San Juan Capistrano which resulted in one inch of rain in just 20 minutes. In Silverado Canyon, 0.88 of rain was reported in 1 hour from two rain gauges.	No major damages were reported by the County.
July 3, 2020	-	High tide near 6.8 feet and high surf caused minor coastal flooding in Newport Beach, resulting in $40,000 in property damages. Flooding extended up to three blocks inland, and a sailboat was washed ashore and destroyed.	No major damages were reported by the County
March 10, 2021	-	Mud and debris flows from the Bond Fire caused $75,000 in property damages, damaging 8 vehicles and 6 homes. Swift water rescues were performed around 6 to 7 am. Mud covered at least 3 locations on Silverado Canyon Road and at Silverado Cafe, with rainfall rates reaching 0.20 inches in 15 minutes.	No major damages were reported by the County.

Dates of Event	Event Type (Disaster Declaration)	Summary of Event	Summary of Damage and Losses in Unincorporated Orange County
December 14, 2021	-	Debris flows from the Bond Fire scar and Silverado Canyon caused $800,000 in property damages. Santiago Creek Road was blocked by high water and mud, while Jackson Creek Road was flooded with mud and debris. Rainfall rates reached up to 1.2 inches at Irvine Lake and Santiago Canyon.	Multiple locations of debris flow on roadways throughout the canyons. Vac truck and hand crews were used to clear drains in Orange Park Acres. Down tree in Ladera Ranch. Evacuation Order for Silverado, Williams, and Modjeska Canyons – message boards deployed. The rough cost estimate for OCPW is $100,000 for Dec. 14th.
January 15, 2022	-	A Tsunami Advisory was issued at 5:03 AM for the Orange County Coast. Wireless Emergency Alerts and sirens were activated. The first wave arrived around 8 AM, causing coastal damage, including a drifting buoy off Huntington Bay.	No major damages were reported by the County.
January 8, 2023 – January 31, 2023	EM-3591-CA	EM-3591-CA was an emergency declaration for California due to severe winter storms, flooding, and mudslides from January 8 to January 31, 2023. Issued on January 9, 2023, it provided federal assistance to support state, local, and tribal response efforts.	Debris removal throughout Orange, Tustin, Santa Ana, and Ladera Ranch. Multiple locations of mudslides, trees down, vac truck and hand crew drain clearing throughout the canyons. Crews needed to remove accumulated debris, trash and other items from waterways and channels Facility locations C02 Bolsa Chica at Saybrook and F01 Warner to University. Clearing of debris booms, access ramps, including fence lines following heavy rain and swift water during the series of storm events (Atmospheric Rivers) OCPW Cost Estimate: $300k
March 1, 2023	-	Caltrans issued a Sig Alert for flooding at the I-5 and Highway 55 transition, causing $10,000 in property damages. Approximately 0.8 inches of rain fell in the area.	No major damages were reported by the County.
March 9, 2023 – July 20, 2023	EM-3592-CA	Local media reported coastal flooding up to 18 inches deep near Seal Beach Pier due to high tide and surf. At least one car was swamped, but no damage to homes or businesses was confirmed.	March 2023 Winter Storms: Costs/damages from government jurisdictions: $38,922,781.38 Known costs/damages to private properties: $10,180,000.00 Tropical Cyclone Hilary (August 2023): Costs/damages from government jurisdictions: $887,015.75

EM = Emergency Declaration (FEMA); FEMA = Federal Emergency Management Agency; DR = Major Disaster Declaration (FEMA); N/A = Not applicable
Source: NWS, 2024; FEMA, 2024

Problem Areas

In addition to the hazard event history, Orange County has identified the problem areas listed in Table 1-15 associated with flood-related damage. This information was provided by Orange County Public Works O&M 2020 data records.

Table 1-15. Problem Areas Identified from Historical Flood-Related Events in Orange County

Location / Address	Jurisdiction	Description of Problem Area
A02 at Bridgeport Circle & Bastanchury	Flood control channel; OC Public Works jurisdiction	Check for debris in on bridge supports
A02 Valley View to Brea Blvd	Flood control channel; OC Public Works jurisdiction	Check for washouts
A03 at State College and Yorba Linda Blvd	Flood control channel; OC Public Works jurisdiction	Check for trash and debris
A03 at Almira and State College	Flood control channel; OC Public Works jurisdiction	Check for debris
A03 at Dorothy Ln	Flood control channel; OC Public Works jurisdiction	Check for debris at drop structure and roadway over topping
A03 at 5 freeway and Stanton	Flood control channel; OC Public Works jurisdiction	Check on channel lining repair
A04 at Mercury Ln	Flood control channel; OC Public Works jurisdiction	Check invert and channel slope
A07 at Imperial Hwy and Apartment Complex	Flood control channel; OC Public Works jurisdiction	Under review due to large erosion
B01 Western Ave to Knott	Flood control channel; OC Public Works jurisdiction	Check for washouts
B01 Chippewa to 5 freeway	Flood control channel; OC Public Works jurisdiction	Check service road for washouts
B01 Raymond to Acacia	Flood control channel; OC Public Works jurisdiction	Check walk side of channel for washouts
E01 at Seashore Drive drain	Flood control channel; OC Public Works jurisdiction	Check for obstructions
E02 at Coronado to Mira Loma	Flood control channel; OC Public Works jurisdiction	Monitor channel slopes for toe cutting, sloughing, and erosion
C01S01	Flood control channel; OC Public Works jurisdiction	Check for debris
C01S02	Flood control channel; OC Public Works jurisdiction	Check for debris
C01S03	Flood control channel; OC Public Works jurisdiction	Check for debris
C02 at Saybrook upstream and downstream	Flood control channel; OC Public Works jurisdiction	Check debris barrier
C02 at Westminster	Flood control channel; OC Public Works jurisdiction	Check channel roads and slopes
C04 at Beach	Flood control channel; OC Public Works jurisdiction	Check for over topping
C04 at Hoover	Flood control channel; OC Public Works jurisdiction	Check debris barrier
C05 at 405 Freeway and Beach Blvd	Flood control channel; OC Public Works jurisdiction	Monitor for over topping
C05 at Allard	Flood control channel; OC Public Works jurisdiction	Check for over topping
C05 at Beach Blvd	Flood control channel; OC Public Works jurisdiction	Monitor for over topping
C05 at Euclid	Flood control channel; OC Public Works jurisdiction	Check for over topping
C05 at Tide Gates	Flood control channel; OC Public Works jurisdiction	Check debris barrier

Location / Address	Jurisdiction	Description of Problem Area
D02 Outlet	Flood control channel; OC Public Works jurisdiction	Monitor for flow and blockages
F01 at Mesa to Back Bay	Flood control channel; OC Public Works jurisdiction	Monitor trash boom, check for further erosion along channel
F06 at 5 Freeway and F07 confluence	Flood control channel; OC Public Works jurisdiction	Check debris barrier
F06S03 at Harvard	Flood control channel; OC Public Works jurisdiction	Inspect for further erosion and check for blockages of box
F07 at Fairhaven Ave	Flood control channel; OC Public Works jurisdiction	Check for slope erosion, check plastic slope liner has not shifted
F07 at Jamboree Rd	Flood control channel; OC Public Works jurisdiction	Inspect trash boom
F08 at Dyer Road to Main St	Flood control channel; OC Public Works jurisdiction	Inspect earthen slope for erosion, inspect for erosion behind concrete panels, inspect for displaced or heavily damaged concrete panels
F08 at Von Karmen	Flood control channel; OC Public Works jurisdiction	Inspect for earthen slope erosion
F09 at Barranca Pkwy	Flood control channel; OC Public Works jurisdiction	Inspect for earthen slope erosion
F10 at 2832 Dow Ave	Flood control channel; OC Public Works jurisdiction	Inspect for overtopping, check muscle walls are intact
F14 University to Sand Cyn	Flood control channel; OC Public Works jurisdiction	Monitor top of slope behind channel lining
F23 at Avenida de la Carlota to Mill Creek Dr	Flood control channel; OC Public Works jurisdiction	Monitor for flow, level, and possible erosion.
G00D02 at Harbor View	Flood control channel; OC Public Works jurisdiction	Monitor water level and check inlet/outlet grates
I02B01	Flood control channel; OC Public Works jurisdiction	Monitor water level
I02 at 2675 Laguna Cyn Rd	Flood control channel; OC Public Works jurisdiction	Check for debris at inlet grates
I02 at Milligan	Flood control channel; OC Public Works jurisdiction	Check for debris at inlet grate
I02 at Woodland to Frontage Rd	Flood control channel; OC Public Works jurisdiction	Monitor
I00P03 at Glenneyre St	Flood control channel; OC Public Works jurisdiction	Monitor for flow, level, and possible erosion.
J01 at Northcrest Dr and El Toro Rd	Flood control channel; OC Public Works jurisdiction	Monitor erosion
J01 at 5 freeway	Flood control channel; OC Public Works jurisdiction	Check for debris along inlet pipes
L01 at Stonehill Dr to 5 Freeway	Flood control channel; OC Public Works jurisdiction	Monitor for flow, level, and possible erosion.
L02 at Rancho Viejo Rd (5 Freeway)	Flood control channel; OC Public Works jurisdiction	Monitor erosion
H05 Emerald Bay Outlet	Flood control channel; OC Public Works jurisdiction	Monitor for flow, level, and possible erosion.
I02 Laguna Canyon Channel Outlet	Flood control channel; OC Public Works jurisdiction	Monitor for flow, level, and possible erosion.
J01 Aliso Creek Channel Outlet	Flood control channel; OC Public Works jurisdiction	Monitor for flow, level, and possible erosion.
K01 Salt Creek Channel Outlet	Flood control channel; OC Public Works jurisdiction	Monitor for flow, level, and possible erosion.

Location / Address	Jurisdiction	Description of Problem Area
L01 San Juan Channel Outlet	Flood control channel; OC Public Works jurisdiction	Monitor for flow, level, and possible erosion.
M01 Prima Deshecha Channel Outlet	Flood control channel; OC Public Works jurisdiction	Monitor for flow, level, and possible erosion.
M02 Segunda Deshecha Channel Outlet	Flood control channel; OC Public Works jurisdiction	Monitor for flow, level, and possible erosion.
M00S07 Marquita Storm Drain Outlet	Flood control channel; OC Public Works jurisdiction	Monitor for flow, level, and possible erosion.

Source: Orange County Public Works O&M, 2020.

1.6.3 Hazard Ranking and Vulnerabilities

The hazard profiles in Volume I have detailed information regarding each planning partner's vulnerability to the identified hazards. The following presents key risk assessment results for Orange County unincorporated areas.

Hazard Ranking

The participating jurisdictions have differing degrees of vulnerability to the hazards of concern, so each jurisdiction ranked its own degree of risk to each hazard. The community-specific hazard ranking is based on problems and impacts identified by the risk assessment presented in Volume I. The ranking process involves an assessment of the likelihood of occurrence for each hazard; the potential impacts of the hazard on people, property, and the economy; community capabilities to address the hazard; and changing future climate conditions.

Table 1-16 shows unincorporated Orange County's final hazard rankings for identified hazards of concern. Mitigation action development uses the ranking to target hazards with the highest risk. Hazards with a risk ranking of "low," such as Flood, Sea Level Rise, and Tsunami, may not present the most risk but remain a concern and mitigation action priority for the County and participating jurisdictions. Stakeholder feedback indicates although Flood risk ranking is low, unincorporated Orange County communities are still focused on addressing mitigation projects related to the hazard. In addition, hazards ranked as "high," such as Dam Failure, does not necessarily indicate a surety of the hazard occurring or a prevalence of high-hazard dams, rather this ranking suggests that if a dam failure were to occur the potential impacts on the people, property, and economy would be very significant. The risk associated with "high" ranking are categorized as low-probability and high-consequence events.

Table 1-16. Hazard Risk Ranking

Hazard	Rank
Flood	Low
Riverine Flood	Medium
Coastal Flood	Low
Sea Level Rise	Low
Tsunami	Low
Dam Failure	High

Note: The scale is based on the hazard rankings established in Volume I, modified as appropriate based on review by the jurisdiction

Critical Facilities

Table 1-17 identifies which critical facilities in unincorporated Orange County are (Y/Yes) and are not (N/Not) located in the 1 percent and 0.2 percent annual chance event floodplains – i.e., Special Flood Hazard Areas (SFHA).

Table 1-17. Critical Facility Exposure to the Special Flood Hazard Area (SFHA)

Name	Type	SFHA Exposure	
		1% Annual Chance Event	0.2% Annual Chance Event
John Wayne Airport (JWA)	Airport	N	N
Fairmont Private Schools, North Tustin Campus	Alternative Education	N	N
Foothill Montessori School, LLC	Alternative Education	N	N
Hope Christian PSP	Alternative Education	N	N
Montessori of Ladera Ranch	Alternative Education	N	N
Oakridge Private	Alternative Education	N	N
Saint Michael's Prep School	Alternative Education	N	N
St. Theophan Academy	Alternative Education	N	N
The Prentice School	Alternative Education	N	N
GOLDEN YEARS GUEST HOME THE	Assisted Living	N	Y
PACIFICA ROYALE ASSISTED LIVING COMMUNIT	Assisted Living	N	Y
AGAPE SENIOR HOMES LLC	Assisted Living	N	N
CLEARWATER AT NORTH TUSTIN	Assisted Living	N	N
IVY PARK AT TUSTIN	Assisted Living	N	N
REATA GLEN ORANGE COUNTY CCRC LLC	Assisted Living	N	N
ORCHARDS ASSISTED LIVING, THE	Assisted Living	N	N
STATE ROUTE 74 – Bridge	Bridge	N	Y
STATE ROUTE 74 – Bridge	Bridge	N	N
STATE ROUTE 74 – Bridge	Bridge	N	N
STATE ROUTE 1 – Bridge	Bridge	N	Y
INTERSTATE 405 – Bridge	Bridge	N	Y
STATE ROUTE 55 – Bridge	Bridge	N	N
W MACAR-N55 ON-RMP - Bridge	Bridge	N	Y
STATE ROUTE 55 – Bridge	Bridge	N	Y
57 SB ON RAMP – Bridge	Bridge	N	N
STATE ROUTE 241 - Bridge	Bridge	N	N
PORTOLA PKWY – Bridge	Bridge	N	N
N133-S241 CONNECTR - Bridge	Bridge	N	N
N241-S133 CONNECTR - Bridge	Bridge	N	N
ROUTE 133 SB – Bridge	Bridge	N	N
ROUTE 133 NB – Bridge	Bridge	N	N
BEE CANYON RD – Bridge	Bridge	N	N
SR 241 SB – Bridge	Bridge	N	N

Name	Type	SFHA Exposure	
		1% Annual Chance Event	0.2% Annual Chance Event
SR 241 NB – Bridge	Bridge	N	N
SR 241 SB – Bridge	Bridge	N	N
SR 241 NB – Bridge	Bridge	N	N
SR 241 SB – Bridge	Bridge	N	N
SR 241 NB – Bridge	Bridge	N	N
STATE ROUTE 74 WB - Bridge	Bridge	Y	Y
STATE ROUTE 74 – Bridge	Bridge	N	N
SR 73 SB – Bridge	Bridge	N	N
S73-N&S133 – Bridge	Bridge	N	N
SR241 – Bridge	Bridge	N	N
EOC ROAD – Bridge	Bridge	N	N
STATE ROUTE 133 SB - Bridge	Bridge	N	N
STATE ROUTE 133 NB - Bridge	Bridge	N	N
STATE ROUTE 133 SB - Bridge	Bridge	N	N
STATE ROUTE 133 NB - Bridge	Bridge	N	N
STATE ROUTE 133 SB - Bridge	Bridge	N	N
STATE ROUTE 133 NB - Bridge	Bridge	N	N
STATE ROUTE 133 SB - Bridge	Bridge	N	N
STATE ROUTE 133 NB - Bridge	Bridge	N	N
STATE ROUTE 74 WB - Bridge	Bridge	N	N
STATE ROUTE 74 EB - Bridge	Bridge	N	N
STATE ROUTE 74 WB - Bridge	Bridge	N	N
TRABUCO CREEK – Bridge	Bridge	Y	Y
SANTIAGO CREEK - Bridge	Bridge	N	N
SANTIAGO CREEK - Bridge	Bridge	N	N
WILLIAMS CANYON CREEK - Bridge	Bridge	N	Y
LIMESTONE CANYON - Bridge	Bridge	N	N
SANTA ANA RIVER CHANNEL (TALBERT/MACARTHUR) - Bridge	Bridge	N	Y
SANTA ANA RIVER (HAMILTON AVE) - Bridge	Bridge	N	Y
BREA CANYON CHANNEL - Bridge	Bridge	N	N
BREA CANYON CHANNEL - Bridge	Bridge	N	N
BREA CANYON CHANNEL - Bridge	Bridge	N	N
BREA CANYON CHANNEL - Bridge	Bridge	N	N
SANTA ANA RIVER CHANNEL (WARNER AVE) - Bridge	Bridge	N	Y
SANTA ANA RIVER CHANNEL (EDINGER AVE) - Bridge	Bridge	N	Y
SANTIAGO CREEK - Bridge	Bridge	Y	Y
SANTIAGO CREEK - Bridge	Bridge	N	Y
SILVERADO CANYON CREEK - Bridge	Bridge	Y	Y

Name	Type	SFHA Exposure	
		1% Annual Chance Event	0.2% Annual Chance Event
LADD CANYON – Bridge	Bridge	Y	Y
SILVERADO CANYON CREEK - Bridge	Bridge	Y	Y
SILVERADO CANYON CREEK - Bridge	Bridge	Y	Y
STATE ROUTE 74 WB - Bridge	Bridge	Y	Y
STATE ROUTE 74 – Bridge	Bridge	N	N
SILVERADO CANYON CREEK - Bridge	Bridge	Y	Y
SILVERADO CANYON CREEK - Bridge	Bridge	N	Y
SILVERADO CANYON CREEK - Bridge	Bridge	Y	Y
SILVERADO CANYON CREEK - Bridge	Bridge	Y	Y
SILVERADO CANYON CREEK - Bridge	Bridge	Y	Y
SILVERADO CANYON CREEK - Bridge	Bridge	Y	Y
SANTIAGO CREEK - Bridge	Bridge	Y	Y
SILVERADO CANYON CREEK - Bridge	Bridge	Y	Y
SILVERADO CANYON CREEK - Bridge	Bridge	Y	Y
SANTA ANA RIVER (ADAMS AVE) - Bridge	Bridge	N	Y
SANTA ANA RIVER CHANNEL (SEGERSTROM-SLATER) - Bridge	Bridge	N	Y
SANTIAGO CREEK - Bridge	Bridge	Y	Y
HANDY CREEK – Bridge	Bridge	Y	Y
REDHILL CHANNEL - Bridge	Bridge	N	N
ARROYO TRABUCO - Bridge	Bridge	N	N
SAN JUAN CREEK – Bridge	Bridge	N	N
WILDLIFE UNDERCROSSING - Bridge	Bridge	N	N
SANTA ANA RIVER CHANNEL (HARBOR BLVD) - Bridge	Bridge	N	Y
ARROYO TRABUCO - Bridge	Bridge	N	N
AIRPORT DRIVE OC - Bridge	Bridge	N	N
ROUTE 405 ACCESS OC - Bridge	Bridge	N	N
DEPARTURES VIADUCT - Bridge	Bridge	N	N
NORTHWEST SPUR - Bridge	Bridge	N	Y
NORTHEAST SPUR - Bridge	Bridge	N	Y
SOUTHERN SPUR OC - Bridge	Bridge	N	N
HICKS CANYON HAUL ROAD OC - Bridge	Bridge	N	N
HANDY CREEK – Bridge	Bridge	Y	Y
NORTHERLY CHIQUITA CANYON - Bridge	Bridge	Y	Y
CHIQUITA CYN DR OC - Bridge	Bridge	N	N
GOBERNADORA CANYON - Bridge	Bridge	N	N
SILVERADO CREEK - Bridge	Bridge	Y	Y
BOLSA CHICA OIL SERVICE - Bridge	Bridge	N	Y
Los Angeles SMSA Limited Partnership	Cellular Tower	N	N

Name	Type	SFHA Exposure	
		1% Annual Chance Event	0.2% Annual Chance Event
Emergency Management Division	County Facility	N	N
Irvine Lake	County Park	N	N
Irvine Ranch Open Space	County Park	Y	Y
Irvine Regional Park	County Park	N	Y
Laguna Coast Wilderness Park	County Park	N	N
O'Neill Regional Park	County Park	N	Y
Ronald W. Caspers Wilderness Park	County Park	N	N
Thomas F. Riley Wilderness Park	County Park	N	N
Villa Park	Dam	N	N
Diemer Ozone Contact Basin	Dam	N	N
Diemer No. 8	Dam	N	N
Diemer Reservoir	Dam	N	N
Round Canyon Retarding Basin	Dam	N	N
Bee Canyon Retention Basin	Dam	N	N
Santiago Creek	Dam	N	N
Syphon Canyon	Dam	N	N
Portola	Dam	N	N
Trampas Canyon	Dam	N	N
East Hicks Canyon Retarding Basin	Dam	N	N
MARGARITA ENERGY CENTER	Electric Power Plant	N	N
PRIMA PLANT	Electric Power Plant	N	N
BREA EXPANSION PLANT	Electric Power Plant	N	N
ORTEGA HIGHWAY ENERGY STORAGE	Electric Power Plant	N	N
BOWERMAN POWER LFG, LLC	Electric Power Plant	N	N
Orange County Fire Authority - Station 15	Fire Station	N	N
Orange County Fire Authority - Station 18	Fire Station	N	N
Orange County Fire Authority - Station 14	Fire Station	Y	Y
Orange County Fire Authority - Station 33	Fire Station	N	N
Orange County Fire Authority - Station 40	Fire Station	N	N
Orange County Fire Authority - Station 16	Fire Station	N	Y
United States Forest Service Cleveland National Forest Fire Station San Juan	Fire Station	N	N
Orange County Fire Authority - Station 8	Fire Station	N	N
Orange County Fire Authority - Station 56	Fire Station	N	N
Orange County Fire Authority Station 25	Fire Station	N	Y
Orange County Fire Authority - Station 11	Fire Station	N	N
Orange County Fire Authority - Station 58	Fire Station	N	N
Orange County Fire Authority Fire Station 67	Fire Station	N	N
Aliso Creek Watershed - Sewage Treatment Plant Hydstra Flood Station	Flood Monitoring Station	N	N

Name	Type	SFHA Exposure	
		1% Annual Chance Event	0.2% Annual Chance Event
Carbon Creek Watershed - Brea Olinda Hydstra Flood Station	Flood Monitoring Station	N	N
Laguna Coastal Watershed - Laguna Canyon Repeater Hydstra Flood Station	Flood Monitoring Station	N	N
Newport Bay Watershed - Bee Canyon Hydstra Flood Station	Flood Monitoring Station	N	N
Newport Bay Watershed - Santa Ana Delhi New Hydstra Flood Station	Flood Monitoring Station	Y	Y
San Juan Creek Watershed - Coto De Caza Hydstra Flood Station	Flood Monitoring Station	N	N
San Juan Creek Watershed - Holy Jim Canyon Hydstra Flood Station	Flood Monitoring Station	N	N
San Juan Creek Watershed - San Juan Guard Hydstra Flood Station	Flood Monitoring Station	N	N
Santa Ana River Watershed - Adkins Spur Hydstra Flood Station	Flood Monitoring Station	N	N
Santa Ana River Watershed - Hicks Canyon Hydstra Flood Station	Flood Monitoring Station	N	N
Santa Ana River Watershed - Irvine Lake Dam Hydstra Flood Station	Flood Monitoring Station	Y	Y
Santa Ana River Watershed - Loma Ridge Hydstra Flood Station	Flood Monitoring Station	N	N
Santa Ana River Watershed - Lower Silverado Canyon Hydstra Flood Station	Flood Monitoring Station	N	N
Santa Ana River Watershed - Modjeska Canyon Hydstra Flood Station	Flood Monitoring Station	N	Y
Santa Ana River Watershed - Santiago Creek E08 Hydstra Flood Station	Flood Monitoring Station	Y	Y
Santa Ana River Watershed - Santiago Peak Hydstra Flood Station	Flood Monitoring Station	N	N
Santa Ana River Watershed - Silverado Motorway Hydstra Flood Station	Flood Monitoring Station	N	N
Santa Ana River Watershed - Upper Harding Canyon Hydstra Flood Station	Flood Monitoring Station	N	N
Santa Ana River Watershed - Upper Silverado Canyon Hydstra Flood Station	Flood Monitoring Station	N	N
James A. Musick Facility	Jail	N	N
Frank R. Bowerman Landfill	Landfill	N	N
Olinda Alpha Landfill	Landfill	N	N
Prima Deshecha Landfill	Landfill	N	N
Ladera Ranch Library	Library	N	N
Library of the Canyons	Library	N	N
PAGING SYSTEMS, INC.	Paging Transmission Tower	N	N

Name	Type	SFHA Exposure	
		1% Annual Chance Event	0.2% Annual Chance Event
AIRCRAFT SERVICE INTERNATIONAL GROUP	Petroleum Bulk Station/Terminal	N	N
Ladera Ranch Elementary	Primary Education	N	N
Oso Grande Elementary	Primary Education	N	N
Esencia	Primary Education	N	N
Las Flores Elementary	Primary Education	N	N
Wagon Wheel Elementary	Primary Education	N	N
Chaparral Elementary	Primary Education	N	N
El Morro Elementary	Primary Education	N	N
Panorama Elementary	Primary Education	N	N
Glenknoll Elementary	Primary Education	N	N
Trabuco Elementary	Primary Education	N	Y
Arroyo Elementary	Primary Education	N	N
Guin Foss Elementary	Primary Education	N	N
Loma Vista Elementary	Primary Education	N	Y
Red Hill Elementary	Primary Education	N	N
Barbara Benson Elementary	Primary Education	N	N
Tustin Memorial Elementary	Primary Education	N	N
Francis Hopkinson Elementary	Primary Education	N	Y
Jack L. Weaver Elementary	Primary Education	N	Y
Richard Henry Lee Elementary	Primary Education	N	Y
Rossmoor Elementary	Primary Education	N	Y
Ladera Ranch Middle	Secondary Education	N	N
Esencia Middle	Secondary Education	N	N
Tesoro High	Secondary Education	N	N
Las Flores Middle	Secondary Education	N	N
Foothill High	Secondary Education	N	N
Hewes Middle	Secondary Education	N	N
CATALINIA PACIFIC CONCRETE CO SAN JUAN PLANT	TRI Facility	N	N
CATALINIA PACIFIC CONCRETE PLANT	TRI Facility	N	N
SMART LEVELS MEDIA	TRI Facility	N	N
OC Zoo	Zoo	Y	Y

Source: California Department of Education 2024; Caltrans 2024; HIFLD 2022, 2023, 2024; Orange County 2022, Orange County Sheriff's Department 2024; U.S. Geological Survey 2024; USACE 2024
Note: N = Facility is NOT exposed to the SFHA Zone (1% / 0.2%); Y = Facility IS exposed to the SFHA Zone (1% / 0.2%).

Dam Hazard Vulnerability

The U.S. Army Corps of Engineers (USACE) operates and maintains approximately 740 dams across the United States, providing benefits such as flood risk management, water supply, hydropower, and environmental

stewardship (USACE 2021). USACE classifies its dams into five Dam Safety Action Classes (DSAC), ranging from DSAC I (highest risk) to DSAC V (lowest risk), based on factors like event probability, probability of failure, and potential consequences (USACE 2010). This risk-informed approach ensures that dam safety decisions prioritize life safety and effective resource allocation (USACE 2021). Refer to Table 1-18 for the USACE dams located in unincorporated Orange County.

Table 1-18. USACE Dams and Population in Dam Inundation Area for Unincorporated Orange County

Dam Name	Total Population (2020 Decennial)	Estimated Number of People Located in Dam Inundation Area	Estimated Percent Total of People Located in Dam Inundation Area
Brea Dam	132,877	8,268	6.2%
Carbon Canyon Dam	132,877	21,803	16.4%
Fullerton Dam	132,877	0	0.0%
Prado Dam	132,877	29,506	22.2%
Whittier Dam	132,877	14,112	10.6%

Source: U.S. Census Bureau 2020; USACE 2024

The California Division of Safety of Dams (DSOD) oversees the design, construction, and maintenance of over 1,200 jurisdictional-sized dams in California (CA DWR 2025). Established in 1929, DSOD ensures dam safety by conducting annual inspections, reviewing structural and hydrological analyses, and approving modifications to existing dams. Dams are classified based on their downstream hazard potential, which ranges from high to low, reflecting the potential impact on life and property in the event of a failure (CA Office of Emergency Services GIS 2020). This classification system helps prioritize safety measures and resource allocation to protect communities and infrastructure. Refer to Table 1-19 for the CA DSOD dams located in unincorporated Orange County.

Table 1-19. CA DSOD Dams and Population in Dam Inundation Area for Unincorporated Orange County

Dam Name	Total Population (2020 Decennial)	Estimated Number of People Located in Dam Inundation Area	Estimated Percent Total of People Located in Dam Inundation Area
Big Canyon Dam	132,877	0	0.0%
Diemer Dam	132,877	0	0.0%
Deimer No.8 Dam	132,877	0	0.0%
Deimer Ozone Dam	132,877	0	0.0%
Dove Canyon Dam	132,877	0	0.0%
Harbor View Dam	132,877	0	0.0%
Mission Viejo Dam	132,877	0	0.0%
Lower Peters Canyon Dam	132,877	0	0.0%
Peters Canyon Dam	132,877	136	0.1%
Portola Dam	132,877	16	<0.1%
Rattlesnake Dam	132,877	0	0.0%
Rossmoor Dam	132,877	0	0.0%
San Joaquin Dam	132,877	0	0.0%
Sand Canyon	132,877	0	0.0%
Santiago Dam	132,877	8,356	6.3%
Sulphur Creek Dam	132,877	0	0.0%

Dam Name	Total Population (2020 Decennial)	Estimated Number of People Located in Dam Inundation Area	Estimated Percent Total of People Located in Dam Inundation Area
Syphon Dam	132,877	0	0.0%
Trampas Dam	132,877	192	0.1%
Upper Chiquita Dam	132,877	0	0.0%
Upper Oso Dam	132,877	0	0.0%
Villa Park Dam	132,877	4,618	3.5%
Walnut Dam	132,877	0	0.0%
Yorba Dam	132,877	0	0.0%

Source: U.S. Census Bureau 2020; State of California - Department of Water Resources, Division of Safety of Dams 2024

1.6.4 Identified Issues

After review of Orange County's hazard event history, hazard rankings, hazard location, and current capabilities, the County identified the following vulnerabilities within the community:

- The Carbon Creek Channel needs upgrades in order to contain a 100-year storm during hazard events which may result in flooding impacts.
- The following channels have proposed upgrades to reduce the quantity of trash and debris from flowing into the ocean.
  - Coyote Creek Channel (A01)
  - Imperial Channel (A07)
  - Carbon Creek Channel (B01)
  - Santa Ana Delhi Channel (F01)
- The East Garden Grove-Wintersburg Channel needs upgrades in order to contain a 100-year storm during hazard events which may result in flooding impacts.
- The San Juan Creek Channel and bridge needs upgrades in order to contain a 100-year storm during hazard events which may result in flooding impacts.
- The San Juan Creek Channel needs upgrades in order to contain a 100-year storm during hazard events may result in flooding impacts.
- The flood control facility at the Warner Avenue Bridge is not built to convey the 100-year storm.
- The Fullerton Creek Channel needs upgrades in order to contain a 100-year storm during hazard events which may result in flooding impacts.
- The channel that is located from Bayview Bridge to Mesa Drive needs restoration in order to properly convey water during increased flood events.
- The west levee along E01 does not meet FEMA levee freeboard height limitations and therefor currently does not properly function to mitigate flooding in the area.
- Flood improvement projects are expensive, and the county faces financial constraints. With a significant backlog of projects awaiting completion, only a select few can be included in the CIP 7-year plan. Additionally, collaboration with the USACE presents challenges due to their reliance on fluctuating federal funding. The aging infrastructure further complicates matters, as many systems are approaching the end of their expected life cycle.

- The County does not have many options in place to mitigate coastal flooding concerns for coastal communities. Some options to mitigate this hazard include property acquisition or elevation, which pose a significant cost for the County to implement.
- OC Public Works has made some progress on flood control projects to remove properties from the floodplain, such as along the East Garden Grove-Wintersburg Channel (Facility C05); however, these multi-phased projects have not been entirely completed at this time so the full benefits will not be realized for some time.
- Areas with potential evacuation issues during a flood event in Unincorporated Orange County include the Canyon areas (Silverado Canyon, Williams Canyon, Modjeska Canyon, Trabuco Canyon, etc.) due to a single ingress/egress into/from the areas. Previous post-fire debris flows have also impacted these areas and OC Sheriff's Emergency Management has evacuated the areas in the past.
- A large swath of the entire County would be impacted if Prado Dam had a failure. Additionally, the Prado Dam is owned and operated by USACE and is classified as a High Hazard Dam. The USACE also designates this dam as Class II under the Dam Safety Action Classification system. These classifications indicate that failure or mis operation of the dam would likely result in loss of life and significant property damage and are deemed a 'high to very high' in terms of failure risk.

1.7 MITIGATION STRATEGY AND PRIORITIZATION

Orange County participated in the mitigation strategy workshop for this FMP to identify appropriate actions to include in a mitigation action catalogue. Its comprehensive consideration of all possible activities to address flood-related hazards of concern included review of the six CRS action categories:

- **Property Protection (PP)** -These actions include public activities to reduce hazard losses or actions that involve (1) modification of existing buildings or structures to protect them from a flood hazard or (2) removal of structures from the flood hazard area.
- **Preventative Measures (PR)** - Government, administrative, or regulatory actions, or processes that influence the way land and buildings are developed and built. Examples include planning and zoning, capital improvement plans, etc.
- **Public Information (PI)** - Actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them.
- **Natural Resource Protection (NRP)** - Actions that minimize flood hazard loss and preserve or restore the functions of natural systems.
- **Structural Flood Control Project (SP)** - Actions that involve the construction of structures to reduce the impact of a flood hazard. Such structures include dams, setback levees, floodwalls, retaining walls, and safe rooms.
- **Emergency Services (ES)** - Actions that protect people and property during and immediately following a disaster or flood related hazard event. Services include warning systems, emergency response services, and the protection of essential facilities.

The action worksheets included at the end of this annex list the mitigation actions that Orange County would like to pursue in the future to reduce the effects of flood-related hazards. The actions are dependent upon available funding (grants and local match availability) and may be modified or omitted at any time based on the occurrence of new flood-related hazard events and changes in County priorities. Action summary information is provided in Table 1-20.

Volume I identifies 14 evaluation criteria for prioritizing the mitigation actions. To assist with rating each mitigation action as high, medium, or low priority, a numeric rank is assigned (-1, 0, or 1) for each of the evaluation criteria. Table 1-21 provides a summary of the prioritization of all proposed mitigation actions for the FMP. Note that the project action worksheets provide an 'estimated cost'. These were based upon a verbal scale of 'low', 'medium' and high as well. FEMA guidance provided a quantitative range for the verbal scale based on the community's best estimate. Specifically, 'low' cost would be projects less than $10,000, 'medium' cost projects would be between $10,000 and $100,000, with 'high' cost projects exceeding $100,000 (201.6 n.d.).

Table 1-20. Mitigation Action Summary

Project Number	Project Name	Flood Hazard	Responsible Party	Brief Summary of the Problem and the Solution (Project)	CRS Category
2025-OC-FMP1	Carbon Creek Channel (B01)	Flood, Riverine Flood	Orange County Public Works / Infrastructure Programs	The Carbon Creek Channel needs upgrades in order to contain a 100-year storm during hazard events which may result in flooding impacts. The project consists of reconstructing the existing trapezoidal earthen rip rap channel per assessment report, allowing the channel to convey a 100-year storm.	PR, SP, PP
2025-OC-FMP2	Debris Booms Project (A01, A07, B01, F01)	Flood, Riverine Flood	Orange County Public Works / Infrastructure Programs	The following Channels have proposed upgrades to reduce the quantity of trash and debris from flowing into the ocean. • Coyote Creek Channel (A01) • Imperial Channel (A07) • Carbon Creek Channel (B01) • Santa Ana Delhi Channel (F01) The project will include installation of new floating debris booms at the following OCFCD channels: Coyote Creek Channel (A01), Imperial Channel (A07), Carbon Creek Channel (B01), and Santa Ana Delhi Channel (F01).	PR, SP, PP, NRP
2025-OC-FMP3	East Garden Grove-Wintersburg Channel (C05)	Flood, Riverine Flood	Orange County Public Works / Infrastructure Programs	The East Garden Grove-Wintersburg Channel needs upgrades in order to contain a 100-year storm during hazard events which may result in flooding impacts. The project consists of improvements, such as reconstructing the existing trapezoidal earthen rip rap channel to a concrete rectangular channel, allowing the channel reach to convey a 100-year storm.	PR, SP, PP
2025-OC-FMP4	San Juan Creek Channel (L01) Reach 1	Flood, Riverine Flood	Orange County Public Works / Infrastructure Programs	The San Juan Creek Channel and bridge needs upgrades in order to contain a 100-year storm during hazard events which may result in flooding impacts. The project consists of bridge replacement and channel improvements, allowing the channel reach to convey a 100-year storm.	PR, SP, PP

Project Number	Project Name	Flood Hazard	Responsible Party	Brief Summary of the Problem and the Solution (Project)	CRS Category
2025-OC-FMP5	San Juan Creek Channel (L01) Reach 2	Flood, Riverine Flood	Orange County Public Works / Infrastructure Programs	The San Juan Creek Channel needs upgrades in order to contain a 100-year storm during hazard events which may result in flooding impacts. The project consists of reconstructing the existing trapezoidal channel into a rectangular channel with drop structure(s), allowing the channel reach to convey a 100-year storm.	PR, SP, PP
2025-OC-FMP6	San Juan Creek Channel (L01) Reach 3	Flood, Riverine Flood	Orange County Public Works / Infrastructure Programs	The San Juan Creek Channel needs upgrades in order to contain a 100-year storm during hazard events which may result in flooding impacts. The project consists of retrofitting the existing sheet piles to accommodate conversion into a rectangular channel with drop structure(s), allowing the channel reach to convey a 100-year storm.	PR, SP, PP
2025-OC-FMP7	Bolsa Bay Outlet Flood Control Improvements	Flood, Riverine Flood	Orange County Public Works / Infrastructure Programs	The opening at the Warner Avenue Bridge was not built to convey the 100-year storm. After upstream improvements are completed, the bridge would become a hydraulic constriction The project consists of improving the flood control facility to convey a 100-year storm	PP, SP
2025-OC-FMP8	Fullerton Creek Channel (A03)	Flood, Riverine Flood	Orange County Public Works / Infrastructure Programs	The Fullerton Creek Channel needs upgrades in order to contain a 100-year storm during hazard events which may result in flooding impacts. The project consists of reconstructing the existing trapezoidal concrete lined channel and constructing concrete U-channel to convey a 100-year storm.	PP, SP

Project Number	Project Name	Flood Hazard	Responsible Party	Brief Summary of the Problem and the Solution (Project)	CRS Category
2025-OC-FMP9	Santa Ana-Delhi Channel (F01)	Flood, Riverine Flood	Orange County Public Works / Infrastructure Programs	The channel that is located from Bayview Bridge to Mesa Drive needs restoration in order to properly convey water during increased flood events. The project consists of widening portions of the channel to create additional habitat area, restoring channel slopes to convey a 100-year storm event, and replacing the existing bicycle bridge to allow continued coastal access.	PP, SP, NRP
2025-OC-FMP10	Santa Ana River Channel Reach 5 Levee Height Correction (E01)	Flood, Riverine Flood, Dam Release	Orange County Public Works / Infrastructure Programs	The west levee along E01 does not meet FEMA levee freeboard height requirements, and therefore currently does not function as deisgned to mitigate flooding in the area. The project consists of correcting the west levee height along E01 from the limits provided.	PP, SP
2025-OC-FMP11	Coordination with FEMA Region IX	Flood, Coastal Flood, Riverine Flood, Sea Level Rise, Tsunami, Dam Failure.	Orange County Public Works / Infrastructure Programs	Flood improvement projects are expensive, and the county faces financial constraints. With a significant backlog of projects awaiting completion, only a select few can be included in the CIP 7-year plan. Additionally, collaboration with the USACE can present challenges due to their reliance on fluctuating federal funding. The aging infrastructure further complicates matters, as many systems are starting to approach the end of their expected life cycle. Orange County Public Works - Infrastructure Programs is conducting a study to analyze the backlog of flood projects to rank and prioritize them for programming and funding. The Grants Management group actively seeks funding opportunities from both state and federal grant programs. Once the study is complete, there will be an increased understanding of which projects to prioritize funding for. Grants Management will continue to coordinate with the state and FEMA Region IX for potential funding availability.	PR, PI

Project Number	Project Name	Flood Hazard	Responsible Party	Brief Summary of the Problem and the Solution (Project)	CRS Category
2025-OC-FMP12	Hydrology Manual Update	Coastal Flooding, Flood	Orange County Public Works / Infrastructure Programs	The County does not have many options in place to mitigate coastal flooding concerns for coastal communities. Some options to mitigate this hazard include property acquisition or elevation, both of which are very costly for the County to implement. The County will update the hydrology manual which will look at climate change concerns.	NRP, PI, PR
2025-OC-FMP13	East Garden Grove-Wintersburg Channel: LOMR Properties	Flood, Riverine Flood	Orange County Public Works / Infrastructure Programs	Orange County Public Works has made some progress on flood control projects to protect properties in the floodplain, such as along the East Garden Grove-Wintersburg Channel (Facility C05); however, these multi-phased projects have not all been completed yet, so the full benefits will not be realized for some time. Orange County Public Works will continue to implement flood control projects to protect properties in the floodplain along the East Garden Grove-Wintersburg Channel, such as constructing improvements to the existing channel to reduce the footprint of the floodplain. Once the multi-phased project is complete, Orange County Public Works will submit a Letter of Map Revision (LOMR) to FEMA to update the FIRM maps.	PP, SP

Project Number	Project Name	Flood Hazard	Responsible Party	Brief Summary of the Problem and the Solution (Project)	CRS Category
2025-OC-FMP14	Evacuation for Flood and Post-Fire Debris Flows	Flood, Riverine Flood, Debris Flow	Orange County Public Works/Infrastructure Programs; Orange County Sheriff's Department/Emergency Management Division	Areas with potential evacuation issues during a flood event in Unincorporated Orange County include the Canyon areas (Silverado Canyon, Williams Canyon, Modjeska Canyon, Trabuco Canyon, etc.) due to a single ingress/egress into/from the areas. Previous post-fire debris flows have also impacted these areas and OC Sheriff's Emergency Management has evacuated the areas in the past. The County will continue to conduct outreach to the canyon communities in these vulnerable areas. The County-wide alert system, which includes mass notification services through AlertOC, may be used to disseminate debris flow warnings.	ES
2025-OC-FMP15	Prado Dam Mitigation	Flood, Dam Failure	Orange County Public Works/Infrastructure Programs	A large swath of the County would be impacted in the event of a failure at Prado Dam. The dam is under USACE jurisdiction and is classified as a High Hazard Dam. This classification indicates that potential failure or mis-operation of the dam would likely result in loss of life and significant property damage. The County and USAVE have been working on a project to upgrade Prado Dam, which includes raising the existing embankment, construction new outlet valves, levees, and dikes, and other related tasks. One of the remaining projects is the raising of spillway crest.	SP, PI

Table 1-21. Summary of Prioritization of Actions

Project Number	Project Name	Scores for Evaluation Criteria															Priority (High / Medium / Low)
		Life Safety	Property Protection	Cost-Effectiveness	Political	Legal	Fiscal	Environmental	Social Vulnerability	Administrative	Hazards of Concern	Climate Change	Timeline	Community Lifelines	Other Local Objectives	Total	
2025-OC-FMP1	Carbon Creek Channel (B01)	1	1	1	1	1	1	1	1	0	1	1	0	1	0	11	High
2025-OC-FMP2	Debris Booms Project (A01, A07, B01, F01)	1	1	1	1	1	1	0	1	0	1	0	0	1	1	11	High
2025-OC-FMP3	East Garden Grove-Wintersburg Channel (C05)	1	1	1	1	1	1	1	1	0	1	1	0	1	0	11	High
2025-OC-FMP4	San Juan Creek Channel (L01) Reach 1	1	1	0	1	1	1	0	1	0	1	1	0	1	1	10	Medium
2025-OC-FMP5	San Juan Creek Channel (L01) Reach 2	1	1	1	1	1	1	1	1	0	1	1	0	1	0	11	High
2025-OC-FMP6	San Juan Creek Channel (L01) Reach 3	1	1	1	1	1	1	1	1	0	1	1	0	1	0	11	High
2025-OC-FMP7	Bolsa Bay Outlet Flood Control Improvements	1	1	0	1	1	1	0	1	0	1	1	0	1	1	10	Medium
2025-OC-FMP8	Fullerton Creek Channel (A03)	1	1	1	1	1	1	1	1	0	1	1	0	1	0	11	High
2025-OC-FMP9	Santa Ana-Delhi Channel (F01)	1	1	1	1	1	1	1	1	0	1	1	1	1	1	13	High
2025-OC-FMP10	Santa Ana River Channel Reach 5 Levee Height Correction (E01)	1	1	1	1	1	1	0	1	0	1	1	0	1	1	11	High
2025-OC-FMP11	Coordination with FEMA Region IX	1	1	1	1	1	1	0	1	1	1	1	0	1	1	12	High
2025-OC-FMP12	Hydrology Manual Update	1	1	1	1	1	1	1	1	1	1	1	0	1	1	13	High
2025-OC-FMP13	RL Properties East Garden Grove-Wintersburg Channel: LOMR Properties	1	1	0	1	1	1	1	1	0	1	1	1	1	1	12	High

Project Number	Project Name	Scores for Evaluation Criteria															Priority (High / Medium / Low)
		Life Safety	Property Protection	Cost-Effectiveness	Political	Legal	Fiscal	Environmental	Social Vulnerability	Administrative	Hazards of Concern	Climate Change	Timeline	Community Lifelines	Other Local Objectives	Total	
2025-OC-FMP14	Evacuation for Flood and Post-Fire Debris Flows	1	1	1	1	1	1	0	1	1	1	1	1	1	1	13	High
2025-OC-FMP15	Prado Dam Mitigation	1	1	1	1	1	1	0	1	0	1	1	1	1	1	12	High

Note: Volume I, Section 6 (Mitigation Strategy) conveys guidance on prioritizing mitigation actions. Low (0-6), Medium (7-10), High (11-14).

Action 2025-OC-FMP1. Carbon Creek Channel (B01)

Lead Agency:	Orange County Public Works/Infrastructure Programs
Project Limits:	u/s Gilbert Street to Euclid Street and u/s Western Avenue to Dale Avenue
Hazard(s) of Concern:	Flood, Riverine Flood
Description of the Problem:	The Carbon Creek Channel needs upgrades in order to contain a 100-year storm during hazard events which may result in flooding impacts.
Description of the Solution:	The project consists of reconstructing the existing trapezoidal earthen rip rap channel per assessment report, allowing the channel to convey a 100-year storm.
Estimated Cost:	Medium
Potential Funding Source:	CIP
Implementation Timeline:	Long-term (> 5 years)
Benefits:	The upgrades to the channel will allow for it to properly convey future more extreme events such as the 100-year storm. This will protect residents in the surrounding area from flooding impacts.
CRS Category	PR, SP, PP
Priority	High

Action 2025-OC-FMP2. Debris Booms Project (A01, A07, B01, F01)

Lead Agency:	Orange County Public Works/Infrastructure Programs
Project Limits:	Coyote Creek Channel (A01): u/s Knott Ave; Imperial Channel (A07): u/s Idaho St.; Carbon Creek Channel (B01): u/s Los Alamitos Blvd.; Santa Ana Delhi Channel (F01): from u/s Santa Ana Ave.
Hazard(s) of Concern:	Flood, Riverine Flood
Description of the Problem:	The following Channels have proposed upgrades to reduce the quantity of trash and debris from flowing into the ocean. • Coyote Creek Channel (A01) • Imperial Channel (A07) • Carbon Creek Channel (B01) • Santa Ana Delhi Channel (F01)
Description of the Solution:	The project will include installation of new floating debris booms at the following OCFCD channels: Coyote Creek Channel (A01), Imperial Channel (A07), Carbon Creek Channel (B01), and Santa Ana Delhi Channel (F01).
Estimated Cost:	Low
Potential Funding Source:	CIP
Implementation Timeline:	Long-term (> 5 years)
Benefits:	The floating debris booms installed at the channels will provide added protection against downstream trash and debris buildup. They will also limit the amount of debris build up in the channel, which may cause added flooding impacts to nearby residents via reduced capacity. This action will also protect downstream habitats from trash and debris.
CRS Category	PR, SP, PP, NPR
Priority	High

Action 2025-OC-FMP3. East Garden Grove-Wintersburg Channel (C05)

Lead Agency:	Orange County Public Works/Infrastructure Programs
Project Limits:	u/s Quartz Street to u/s Bushard Boulevard; u/s McFadden Avenue / Brookhurst Street to Ward Street; from the confluence with Ocean View Channel (C06) to d/s Woodruff Street; from Tide Gates to u/s Graham Street.
Hazard(s) of Concern:	Flood, Riverine Flood
Description of the Problem:	The East Garden Grove-Wintersburg Channel needs upgrades in order to contain a 100-year storm during hazard events which may result in flooding impacts.
Description of the Solution:	The project consists of improvements, such as reconstructing the existing trapezoidal earthen rip rap channel to a concrete rectangular channel, allowing the channel reach to convey a 100-year storm.
Estimated Cost:	Medium
Potential Funding Source:	CIP
Implementation Timeline:	Long-term (> 5 years)
Benefits:	The upgrades to the channel will allow for it to properly convey future more extreme events such as the 100-year storm. This will protect residents in the surrounding area from flooding impacts.
CRS Category	PR, SP, PP
Priority	High

Action 2025-OC-FMP4. San Juan Creek Channel (L01) Reach 1

Lead Agency:	Orange County Public Works/Infrastructure Programs
Project Limits:	Reach 1; Ocean outlet to u/s of Coast Hwy/Park Lantern
Hazard(s) of Concern:	Flood, Riverine Flood
Description of the Problem:	The San Juan Creek Channel and bridge needs upgrades in order to contain a 100-year storm during hazard events which may result in flooding impacts.
Description of the Solution:	The project consists of bridge replacement and channel improvements, allowing the channel reach to convey a 100-year storm.
Estimated Cost:	High
Potential Funding Source:	CIP
Implementation Timeline:	Long-term (> 5 years)
Benefits:	The upgrades to the channel will allow for it to properly convey future more extreme events such as the 100-year storm. This will protect residents in the surrounding area from flooding impacts. Bridge replacement will also increase hydraulic capacity of the channel while ensuring safety during hazard events for evacuation and transportation routes.
CRS Category	PR, SP, PP
Priority	High

Action 2025-OC-FMP5. San Juan Creek Channel (L01) Reach 2

Lead Agency:	Orange County Public Works/Infrastructure Programs
Project Limits:	Reach 2; u/s Coast Hwy/Park Lantern to u/s of Stonehill Dr.
Hazard(s) of Concern:	Flood, Riverine Flood
Description of the Problem:	The San Juan Creek Channel needs upgrades in order to contain a 100-year storm during hazard events which may result in flooding impacts.
Description of the Solution:	The project consists of reconstructing the existing trapezoidal channel into a rectangular channel with drop structure(s), allowing the channel reach to convey a 100-year storm.
Estimated Cost:	Medium
Potential Funding Source:	CIP
Implementation Timeline:	Long-term (> 5 years)
Benefits:	The upgrades to the channel will allow for it to properly convey future more extreme events such as the 100-year storm. This will protect residents in the surrounding area from flooding impacts.
CRS Category	PR, SP, PP
Priority	Medium

Action 2025-OC-FMP6. San Juan Creek Channel (L01) Reach 3

Lead Agency:	Orange County Public Works/Infrastructure Programs
Project Limits:	Reach 3; u/s Coast Hwy/Park Lantern to u/s of Stonehill Dr.
Hazard(s) of Concern:	Flood, Riverine Flood
Description of the Problem:	The San Juan Creek Channel needs upgrades in order to contain a 100-year storm during hazard events which may result in flooding impacts.
Description of the Solution:	The project consists of retrofitting the existing sheet piles to accommodate conversion into a rectangular channel with drop structure(s), allowing the channel reach to convey a 100-year storm.
Estimated Cost:	Medium
Potential Funding Source:	CIP
Implementation Timeline:	Long-term (> 5 years)
Benefits:	The upgrades to the channel will allow for it to properly convey future more extreme events such as the 100-year storm. This will protect residents in the surrounding area from flooding impacts.
CRS Category	PR, SP, PP
Priority	High

Action 2025-OC-FMP7. Bolsa Bay Outlet Flood Control Improvements

Lead Agency:	Orange County Public Works/Infrastructure Programs
Project Limits:	Warner Avenue Bridge (d/s).
Hazard(s) of Concern:	Flood, Riverine Flood, Coastal Flooding
Description of the Problem:	The opening at the Warner Avenue Bridge was not built to convey the 100-year storm. After upstream improvements are completed, the bridge would become a hydraulic constriction
Description of the Solution:	The project consists of improving the flood control facility to convey a 100-year storm.
Estimated Cost:	High
Potential Funding Source:	CIP
Implementation Timeline:	Long-term (> 5 years)
Benefits:	By constructing and improving the Warner Avenue Bridge to convey the 100-year storm, upstream residents will be protected against increased future flooding impacts.
CRS Category	PP, SP
Priority	High

Action 2025-OC-FMP8. Fullerton Creek Channel (A03)

Lead Agency:	Orange County Public Works/Infrastructure Programs
Project Limits:	d/s of I-5 freeway to d/s of Dale Avenue
Hazard(s) of Concern:	Flood, Riverine Flood
Description of the Problem:	The Fullerton Creek Channel needs upgrades in order to contain a 100-year storm during hazard events which may result in flooding impacts.
Description of the Solution:	The project consists of reconstructing the existing trapezoidal concrete lined channel and constructing concrete U-channel to convey a 100-year storm.
Estimated Cost:	Medium
Potential Funding Source:	CIP
Implementation Timeline:	Long-term (> 5 years)
Benefits:	The upgrades to the channel will allow for it to properly convey future more extreme events such as the 100-year storm. This will protect residents in the surrounding area from flooding impacts.
CRS Category	PP, SP
Priority	Medium

Action 2025-OC-FMP 9. Santa Ana-Delhi Channel (F01)

Lead Agency:	Orange County Public Works/Infrastructure Programs
Project Limits:	Bayview Bridge to d/s Mesa Drive.
Hazard(s) of Concern:	Flood, Riverine Flood
Description of the Problem:	The channel that is located from Bayview Bridge to Mesa Drive needs restoration in order to properly convey water during increased flood events.
Description of the Solution:	The project consists of widening portions of the channel to create additional habitat area, restoring channel slopes to convey a 100-year storm event, and replacing the existing bicycle bridge to allow continued coastal access.
Estimated Cost:	Medium
Potential Funding Source:	CIP
Implementation Timeline:	Long-term (> 5 years)
Benefits:	The upgrades to the channel will allow for it to properly convey future more extreme events such as the 100-year storm; as well as providing added habitat for the surrounding ecosystem. It will also provide continued public access and recreation by replacing an existing bicycle bridge.
CRS Category	PP, SP, NPR
Priority	High

Action 2025-OC-FMP10. Santa Ana River Channel Reach 5 Levee Height Correction (E01)

Lead Agency:	Orange County Public Works/Infrastructure Programs
Project Limits:	300 feet d/s SR-22 freeway to 300 feet u/s I-5 Fwy
Hazard(s) of Concern:	Flood, Riverine Flood, Dam Failure
Description of the Problem:	The west levee along E01 does not meet FEMA levee freeboard height requirements, and therefore currently does not function as designed to mitigate flooding in the area.
Description of the Solution:	The project consists of correcting the west levee height along E01 from the limits provided.
Estimated Cost:	Medium
Potential Funding Source:	CIP
Implementation Timeline:	Short-term (< 5 years)
Benefits:	Correcting the west levee to meet the height requirements will allow for the system to properly convey flows during hazard events which may result in flooding. This will protect residents in the surrounding area from flooding impacts and dam releases from Prado Dam.
CRS Category	PP, SP
Priority	High

Action 2025-OC-FMP11 Coordination with FEMA Region IX

Lead Agency:	Orange County Public Works/Infrastructure Programs
Project Limits:	County-wide
Hazard(s) of Concern:	Flood, Coastal Flood, Riverine Flood, Sea Level Rise, Tsunami, Dam Failure.
Description of the Problem:	Flood improvement projects are expensive, and the county faces financial constraints. With a significant backlog of projects awaiting completion, only a select few can be included in the CIP 7-year plan. Additionally, collaboration with the USACE can present challenges due to their reliance on fluctuating federal funding. The aging infrastructure further complicates matters, as many systems are starting to approach the end of their expected life cycle.
Description of the Solution:	Orange County Public Works - Infrastructure Programs is conducting a study to analyze the backlog of flood projects to rank and prioritize them for programming and funding. The Grants Management group actively seeks funding opportunities from both state and federal grant programs. Once the study is complete, there will be an increased understanding of which projects to prioritize funding for. Grants Management will continue to coordinate with the state and FEMA Region IX for potential funding availability.
Estimated Cost:	TBD
Potential Funding Source:	FMA, BRIC, HMGP, HMGP-post fire
Implementation Timeline:	Long-Term (> 5 years)
Benefits:	Coordination with the federal and state governments on grant funding opportunities opens conversation for the County to receive future grant funding to complete backlogged flood projects. The funding and subsequent completion of these projects will result in flood protection for residents and tourists in the County's vulnerable areas.
CRS Category	PR, PI
Priority	High

Action 2025-OC-FMP12. Hydrology Manual Update

Lead Agency:	Orange County Public Works/Infrastructure Programs
Project Limits:	The entire County, including coastal communities
Hazard(s) of Concern:	Coastal Flooding, Flood, Sea Level Rise
Description of the Problem:	The County does not have many options in place to mitigate coastal flooding concerns for coastal communities. Some options to mitigate this hazard include property acquisition or elevation, both of which are very costly for the County to implement.
Description of the Solution:	The County will update the hydrology manual which will look at climate change concerns.
Estimated Cost:	TBD
Potential Funding Source:	HMGP, BRIC, NOAA Coastal Resilience Grants
Implementation Timeline:	Long-Term (> 5 years)
Benefits:	By updating the hydrology manual, OC Public Works may be able to incorporate recent information on climate change, which will help safeguard the County, including downstream coastal communities, against future flood risk.
CRS Category	NPR, PI, PR
Priority	High

Action 2025-OC-FMP13. East Garden Grove-Wintersburg Channel: LOMR Properties

Lead Agency:	Orange County Public Works/Infrastructure Programs
Project Limits:	East Garden Grove-Wintersburg Channel
Hazard(s) of Concern:	Flood, Riverine Flood
Description of the Problem:	Orange County Public Works has made some progress on flood control projects to protect properties in the floodplain, such as along the East Garden Grove-Wintersburg Channel (Facility C05); however, these multi-phased projects have not all been completed yet, so the full benefits will not be realized for some time.
Description of the Solution:	Orange County Public Works will continue to implement flood control projects to protect properties in the floodplain along the East Garden Grove-Wintersburg Channel, such as constructing improvements to the existing channel to reduce the footprint of the floodplain. Once the multi-phased project is complete, Orange County Public Works will submit a Letter of Map Revision (LOMR) to FEMA to update the FIRM maps.
Estimated Cost:	Medium
Potential Funding Source:	FMA, HMGP, BRIC, Annual budget
Implementation Timeline:	Long-term (> 5 years)
Benefits:	This action will help to remove residents from the existing floodplain and protecting properties by constructing channel improvements.
CRS Category	PP, SP
Priority	High

Action 2025-OC-FMP14. Evacuation for Flood and Post-Fire Debris Flows

Lead Agency:	Orange County Public Works; Orange County Sheriff's Department Emergency Management Division
Project Limits:	Unincorporated Orange County canyon areas (e.g., Silverado Canyon, Williams Canyon, Modjeska Canyon, Trabuco Canyon, etc.)
Hazard(s) of Concern:	Flood, Riverine Flood, Debris Flow
Description of the Problem:	Areas with potential evacuation issues during a flood event in Unincorporated Orange County include the Canyon areas (Silverado Canyon, Williams Canyon, Modjeska Canyon, Trabuco Canyon, etc.) due to a single ingress/egress into/from the areas. Previous post-fire debris flows have also impacted these areas and OC Sheriff's Emergency Management has evacuated the areas in the past.
Description of the Solution:	The County will continue to conduct outreach to the canyon communities in these vulnerable areas. The County-wide alert system, which includes mass notification services through AlertOC, may be used to disseminate debris flow warnings.
Estimated Cost:	Medium - High
Potential Funding Source:	HMGP, BRIC, Annual budget
Implementation Timeline:	Long-term (> 5 years); Ongoing
Benefits:	This action will ensure the safety of residents living in rural areas of the County which may be impacted by riverine flooding and debris flows. This will continue to enhance the County's capabilities to track hazard events via NWS updates, provide residents with warnings, and provide assistance in evacuation and response following an event.
CRS Category	ES
Priority	High

Action 2025-OC-FMP15. Prado Dam Mitigation

Lead Agency:	Orange County Public Works/Infrastructure Programs
Project Limits:	Areas surrounding the Prado Dam
Hazard(s) of Concern:	Flood, Dam Failure
Description of the Problem:	A large swath of the County would be impacted in the event of a failure at Prado Dam. The dam is under USACE jurisdiction and is classified as a High Hazard Dam. This classification indicates that potential failure or mis-operation of the dam would likely result in loss of life and significant property damage.
Description of the Solution:	The County and USAVE have been working on a project to upgrade Prado Dam, which includes raising the existing embankment, construction new outlet valves, levees, and dikes, and other related tasks. One of the remaining projects is the raising of spillway crest.
Estimated Cost:	High
Potential Funding Source:	HMGP, BRIC, Annual budget
Implementation Timeline:	Long-term (> 5 years)
Benefits:	This action will protect residents who reside downstream of the Prado Dam. The upgrades will increase the reservoir area and impoundment capacity, allowing for greater storage. This action will work to update a high hazard dam.
CRS Category	SP, PI
Priority	High

2. CITY OF ANAHEIM ANNEX

This jurisdictional annex to the Orange County Floodplain Management Plan (FMP) provides information to assist public and private sectors in the unincorporated areas with reducing losses from future hazard events. This annex is not guidance of what to do when a disaster occurs; its focus is on actions that can be implemented prior to a disaster to reduce or eliminate damage to property and people. The annex presents a general overview of the City of Anaheim describes who participated in the planning process, assesses these area's risk, vulnerability, and capabilities, and outlines a strategy for achieving a more resilient community.

2.1 FLOODPLAIN MANAGEMENT PLANNING TEAM

The City of Anaheim identified primary and alternate FMP points of contact and developed this plan over the course of several months, with input from many City departments. The Office of Engineering and Design Services and Planning Department represented the community on the Orange County FMP Planning Partnership and supported the local planning process by securing input from persons with specific knowledge to enhance the plan. All departments were asked to contribute to the annex development through reviewing and contributing to the capability assessment, reporting on the status of previously identified actions, and participating in action identification and prioritization.

Table 2-1 summarizes City officials who participated in the development of the annex and in what capacity. Additional documentation of the City's planning activities through Planning Partnership meetings is included in Volume I.

Table 2-1. Floodplain Management Planning Team

Primary Point of Contact	Alternate Point of Contact
Name/Title: Charles Guiam, Planner Address: 200 S. Anaheim Blvd. Anaheim, CA 92805 Phone Number: 714-765-5149 Email: CMGUIAM@ANAHEIM.NET	Name/Title: William Grigsby, Principal Civil Engineer - Inspections Address: 200 S. Anaheim Blvd. Anaheim, CA 92805 Phone Number: 714-765-5259 Email: WGrigsby@anaheim.net
National Flood Insurance Program Floodplain Administrator	
Name/Title: Heather Allen / Planning & Building Director Address: 200 S. Anaheim Blvd, Anaheim, CA 92805 Phone Number: 714-765-4958 Email: HAllen@anaheim.net	
Additional Contributors	
Name/Title: Keith Linker, Principal Civil Engineer Method of Participation: Provided the City's previous CRS score sheet for consistency purposes. Provided information on previous hazard event history.	

2.2 COMMUNITY PROFILE

2.2.1 Brief History

The City of Anaheim was established in 1857 by German immigrants who acquired land from the Mexican land grant Rancho San Juan Cajón de Santa Ana. Initially, they created a cooperative agricultural community focused

on grape cultivation for wine production. However, after a disease wiped out the vineyards, the community transitioned to growing citrus fruits, chili peppers, and walnuts. The arrival of railroads facilitated the transportation of Anaheim's agricultural products to eastern markets, fostering growth and development.

The City's rapid transformation began in the mid-20th century with the opening of Disneyland in 1955, which quickly became one of the nation's most beloved tourist attractions. This milestone significantly boosted Anaheim's economy and spurred further urban and industrial expansion. In the 1960s, the city also developed major aerospace facilities and became home to professional sports teams, including the Anaheim Angels and the Anaheim Ducks. Today, Anaheim is celebrated for its vibrant cultural attractions, such as the Anaheim Museum and the annual Halloween Parade and forms a metropolitan complex with Santa Ana and Irvine (Britannica 2025).

2.2.2 Location

Anaheim is a prominent City located in northern portion of the County and is part of the Greater Los Angeles area. Positioned approximately 25 miles southeast of Los Angeles, it lies on the plain of the Santa Ana River. Anaheim is well-known for housing the Disneyland Resort, the Anaheim Convention Center, and professional sports teams like the Los Angeles Angels and the Anaheim Ducks. The City's strategic location and diverse attractions make it a significant hub within the region (Britannica 2025).

2.2.3 Governing Body Format

The City of Anaheim is governed by a City Council, which serves as the legislative branch of the City's government. The Council consists of the mayor, who is elected at large, and six council members elected by district. Both the mayor and council members serve four-year terms and are limited to two consecutive terms. Anaheim operates under a council-manager system, where the City Council appoints a city manager to oversee daily operations, implement policies, and advise the Council. This structure ensures that the City's governance is both representative and efficient (City of Anaheim n.d.).

2.2.4 Population and Social Vulnerability

According to the U.S. Census, the 2020 population for the City of Anaheim was 346,824. This is 37.4-percent of the total population of participating jurisdictions.

Research has shown that some populations are at greater risk from hazard events because of decreased resources or physical abilities. These populations can be more susceptible to hazard events based on a number of factors including their physical and financial ability to react or respond during a hazard, and the location and construction quality of their housing. Data from the 2023 American Community Survey indicates that there are 20,133 people 5 years of age or younger, 43,582 people 65 years of age or older, 31,488 people who are non-English speaking, 42,477 people below the poverty threshold, and 33,991 who are considered disabled.

2.3 JURISDICTIONAL CAPABILITY ASSESSMENT AND INTEGRATION

The City of Anaheim performed an inventory and analysis of existing capabilities, plans, programs, and policies that enhance its ability to implement mitigation strategies. Volume I describes the components included in the capability assessment and their significance for floodplain management planning. The jurisdictional assessment for this annex includes analyses of the following:

- Planning and regulatory capabilities
- Development and permitting capabilities
- Administrative and technical capabilities
- Fiscal capabilities
- Education and outreach capabilities
- Classification under various community mitigation programs
- Adaptive capacity to withstand hazard events

For a community to succeed in reducing long-term risk, floodplain management must be integrated into day-to-day local government operations. As part of the floodplain management analysis, planning and /policy documents were reviewed and each jurisdiction was surveyed to obtain a better understanding of their progress toward plan integration. Development of an updated mitigation strategy provided an opportunity for the City to identify opportunities for integrating mitigation concepts into ongoing City procedures.

2.3.1 Planning and Regulatory Capability and Integration

Table 2-2 summarizes the planning and regulatory tools that are available to the City of Anaheim.

Table 2-2. Planning and Regulatory Capability and Integration

	Jurisdiction has this?	Citation and Date (code chapter or name of plan, date of enactment or plan adoption)	Authority (local, county, state, federal)	Responsible Person, Department or Agency
CODES, ORDINANCES, & REGULATIONS				
Building Code	Yes	Anaheim Municipal Code Title 15, Buildings and House, Chapter 15.03, 3/7/2023.	Local	Building Department
How does this reduce risk from flood-related hazards? Chapter 15 establishes minimum standards for construction, design, and maintenance of buildings to ensure safety, health, and general welfare of the public.				
Zoning/Land Use Code	Yes	Anaheim Municipal Code Title 18, Zoning, 6/8/ 2004.	Local	Building Department
How does this reduce risk from flood-related hazards? Chapter 18 defines how land within certain areas can be used, specifying the types of buildings allowed, their purposes, and the standards for their development to ensure orderly growth and compatibility within the City.				
Subdivision Code	Yes	Anaheim Municipal Code Title 17, Land Development and Resources, Section 17.08 Subdivisions, 2/9/2021.	Local	Building Department
How does this reduce risk from flood-related hazards? Chapter 17 governs the division of land into smaller parcels, ensuring proper infrastructure, access, and services are provided to support orderly development and City needs.				
Site Plan Code	Yes	Anaheim Municipal Code Title 18, Zoning, Section 18.72 Specific Plans, 6/8/2004.	Local	Building Department
How does this reduce risk from flood-related hazards? Chapter 18 outlines the requirements for the layout, design, and development of a property, ensuring that proposed projects meet City standards for safety, accessibility, and environmental impact.				

	Jurisdiction has this?	Citation and Date (code chapter or name of plan, date of enactment or plan adoption)	Authority (local, county, state, federal)	Responsible Person, Department or Agency
Stormwater Management Code	Yes	Anaheim Municipal Code Title 10, Public Service and Utilities, Section 10.13 Stormwater Credit Program, 6/27/2023.	Local	Department of Public Works
How does this reduce risk from flood-related hazards? Chapter 10.3 establishes a Stormwater Credit Program designed to incentivize regional stormwater treatment and supply projects through the generation and sale of credits. This program aims to improve water quality, enhance watershed functions, and comply with stormwater regulations by promoting regional stormwater capture and beneficial use.				
Post-Disaster Recovery/ Reconstruction Code	No	-	-	-
How does this reduce risk from flood-related hazards?				
Real Estate Disclosure Requirements	No	-	-	-
How does this reduce risk from flood-related hazards?				
Growth Management	No	-	-	-
How does this reduce risk from flood-related hazards?				
Environmental Protection Ordinance(s)	No	-	-	-
How does this reduce risk from flood-related hazards?				
Flood Damage Prevention Ordinance	Yes	Anaheim Municipal Code Title 17, Land Development and Resources, Chapter 17.28 Flood Hazard Reduction, 8/24/2021.	Local	Department of Public Works
How does this reduce risk from flood-related hazards? Chapter 17.28 aims to protect public health, safety, and welfare by minimizing flood-related losses through regulations on development in areas prone to flooding.				
Wellhead Protection	Yes	Anaheim Municipal Code Title 17 Land Development and Resources, Chapter 17.12 Oil Drilling and Production, 10/19/1965.	Local	Planning and Building Department
How does this reduce risk from flood-related hazards? Chapter 17.12 regulates oil drilling and production to ensure safe and environmentally responsible extraction practices within the City. The chapter outlines requirements for permits, operational procedures, safety measures, and site restoration.				

	Jurisdiction has this?	Citation and Date (code chapter or name of plan, date of enactment or plan adoption)	Authority (local, county, state, federal)	Responsible Person, Department or Agency
Emergency Management Ordinance	Yes	Anaheim Municipal Code Title 6 Public Health and Safety, Chapter 6.04 Emergency Plan and Services, 6/11/2002.	Local	Office of Emergency Management
How does this reduce risk from flood-related hazards? Chapter 6.04 establishes the framework for preparing and implementing emergency plans to protect people and property during emergencies. It also coordinates the City's emergency functions with other public agencies and private entities to ensure an effective response.				
Climate Change Ordinance	No	-	-	-
How does this reduce risk from flood-related hazards?				
Other	Yes	Anaheim Municipal Code Title 10 Public Service and Utilities, Chapter 10.09 National Pollution Discharge Elimination System (NPDES), 12/13/1994.	Local	Department of Public Works
How does this reduce risk from flood-related hazards? Chapter 10.09 establishes regulations to prevent and control water pollution by prohibiting illicit discharges and connections to the stormwater system. It aims to protect water quality and comply with the National Pollution Discharge Elimination System (NPDES) requirements				
PLANNING DOCUMENTS				
Comprehensive/ Master Plan	Yes	Anaheim Master Plan, 8/4/2022 (Land Use).	Local	Planning and Building Department
How does this reduce risk from flood-related hazards? The Plan provides a strategic framework for sustainable and organized development, guiding land use, infrastructure, and economic growth to enhance City quality of life and ensure long-term viability. Public Services and Facilities Element identifies the City's goals, policies, and programs concerning the provision of public facilities and services. Goal 6.1: Maintain a storm drain system that will adequately protect and enhance the health, safety and general welfare of residents, visitors, employees, and their property. Growth Management Element is intended to ensure capital facilities planning meets the needs of current and future residents of Anaheim. Goal 3.1: Ensure the adequate provision of police, fire, library, parks and recreation, school, flood control and other public services and facilities as development occurs in "developing" areas of the city. Safety Element its purpose is to identify potential risks within the City that could endanger the community's public health, safety, and welfare. The Safety Element covers flooding. Goal 3.1: A community resilient to the effects of flooding and dam inundation hazards. Goal 5.1: Ensure that Anaheim is ready to address the impacts associated with climate change.				
Capital Improvement Plan	Yes	Anaheim Capital Improvement Plan 25/26, 2025	Local	Public Works Department
How does this reduce risk from flood-related hazards? The CIP outlines and prioritizes the City's infrastructure and facility projects, ensuring efficient allocation of resources to maintain and enhance public services and community well-being.				
Disaster Debris Management Plan	No	-	-	-
How does this reduce risk from flood-related hazards?				

	Jurisdiction has this?	Citation and Date (code chapter or name of plan, date of enactment or plan adoption)	Authority (local, county, state, federal)	Responsible Person, Department or Agency
Floodplain Management or Watershed Plan	No	-	-	-
How does this reduce risk from flood-related hazards?				
Stormwater Management Plan	Yes	Anaheim Storm Drainage Master Plan, February 2018 (South & East Santa Ana River).	Local	Public Works Department
How does this reduce risk from flood-related hazards? This plan aims to enhance flood protection and manage stormwater runoff through strategic infrastructure improvements and sustainable drainage solutions.				
Open Space Plan	Yes	Anaheim Outdoors Connectivity Plan, 4/30/2013	Local	Community Service Department
How does this reduce risk from flood-related hazards?				
Urban Water Management Plan	Yes	City of Anaheim 2020 Urban Water Management Plan, June 2021.	Local	Public Utilities Department
How does this reduce risk from flood-related hazards? The Plan outlines strategies for ensuring a reliable and sustainable water supply through efficient resource management, conservation efforts, and infrastructure improvements to meet future demands.				
Habitat Conservation Plan	Yes	Anaheim General Plan/Zoning Code Update EIR, May 2004.	Local	Planning and Building Department
How does this reduce risk from flood-related hazards? This plan guides the City's growth and development while establishing goals and policies to protect open spaces and wildlife habitats, thereby minimizing impacts on sensitive species and plant communities.				
Economic Development Plan	No	-	-	-
How does this reduce risk from flood-related hazards?				
Community Wildfire Protection Plan	Yes	2024 Wildfire Mitigation Plan, 5/22/2024.	Local	Public Utilities Department
How does this reduce risk from flood-related hazards? The Plan establishes comprehensive strategies to minimize wildfire risks by enhancing infrastructure resilience, implementing preventative measures, and engaging the City in proactive safety efforts.				
Transportation Plan	Yes	City of Anaheim Transit Master Plan, 12/18/2027.	Local	Public Works Department
How does this reduce risk from flood-related hazards? This Plan aims to enhance public transportation by identifying current needs, analyzing key transit corridors, and proposing improvements to ensure efficient and accessible transit options for residents, visitors, and the workforce.				
Agriculture Plan	Yes	Anaheim Hills Festival Specific Plan Amendment EIR, June 2025	Local	Planning and Building Department
How does this reduce risk from flood-related hazards? This Plan evaluates the environmental impacts of proposed residential and commercial developments, including measures to preserve agricultural land and minimize disruption to existing agricultural activities.				

	Jurisdiction has this?	Citation and Date (code chapter or name of plan, date of enactment or plan adoption)	Authority (local, county, state, federal)	Responsible Person, Department or Agency
Climate Action/ Resilience/Sustainability Plan	No	-	-	-
How does this reduce risk from flood-related hazards?				
Tourism Plan	No	-	-	-
How does this reduce risk from flood-related hazards?				
Business/ Downtown Development Plan	Yes	Greater Downtown of Anaheim, Anaheim Redevelopment Agency, 12/18/2007	Local	City of Anaheim Redevelopment Agency
How does this reduce risk from flood-related hazards? This Plan revitalizes the downtown area by enhancing its urban character, promoting economic development, and creating a pedestrian-friendly environment where people can live, work, and play.				
Other	Yes	Modjeska Park Basin Plan, 2009	Local	Public Works Department
How does this reduce risk from flood-related hazards? This Plan aims to improve water quality, recharge groundwater, reduce flooding, and increase the reliability of future water supplies by implementing an underground stormwater detention and infiltration system.				
RESPONSE/RECOVERY PLANNING				
Emergency Operations Plan	No	-	-	-
How does this reduce risk from flood-related hazards?				
Continuity of Operations Plan	No	-	-	-
How does this reduce risk from flood-related hazards?				
Substantial Damage Response Plan	No	-	-	-
How does this reduce risk from flood-related hazards?				
Threat and Hazard Identification and Risk Assessment	No	-	-	-
How does this reduce risk from flood-related hazards?				
Post-Disaster Recovery Plan	No	-	-	-
How does this reduce risk from flood-related hazards?				

	Jurisdiction has this?	Citation and Date (code chapter or name of plan, date of enactment or plan adoption)	Authority (local, county, state, federal)	Responsible Person, Department or Agency
Other	Yes	City of Anaheim 2022 Local Hazard Mitigation Plan, 5/19/2022	Local	Fire and Rescue Department

How does this reduce risk from flood-related hazards?
The Local Hazard Mitigation Plan identifies and implements strategies to reduce the risks from natural and human-caused hazards, enhancing City resilience and ensuring public safety.

2.3.2 Development and Permitting Capability

Table 2-3 summarizes the capabilities of the City of Anaheim to oversee and track development.

Table 2-3. Development and Permitting Capability

	Yes/No	Comment
Do you issue development permits? • **If you issue development permits, what department is responsible?** • **If you do not issue development permits, what is your process for tracking new development?**	Yes	The Building Division of the Planning and Building Department is responsible for issuing development permits within the City.
Are permits tracked by hazard area? (For example, floodplain development permits.)	No	The City does not track by hazard area at this time.
Do you have a buildable land inventory? • **If you have a buildable land inventory, please describe**	No	Not at this time.
Describe the level of buildout in your jurisdiction.	-	The City is approximately 100% built out with very limited space for new development, unless old infrastructure is destroyed and replaced.

2.3.3 Administrative and Technical Capability

Table 2-4 summarizes potential staff and personnel resources available to the City of Anaheim and their current responsibilities that contribute to floodplain management.

Table 2-4. Administrative and Technical Capabilities

Resources	Available?	Comment
ADMINISTRATIVE CAPABILITY		
Planning Board	Yes	Planning and Building Department
Zoning Board of Adjustment	Yes	Planning Commission is responsible for reviewing and proving recommendations on zoning and land use.
Planning Department	Yes	Planning and Building Department
Mitigation Planning Committee	No	-
Environmental Board/Commission	No	-
Open Space Board/Committee	No	-
Economic Development Commission/Committee	No	-
Public Works/Highway Department	Yes	Department of Public Works

Resources	Available?	Comment
Construction/Building/Code Enforcement Department	Yes	Planning and Building Department
Emergency Management/Public Safety Department	Yes	Emergency and Preparedness Division within the Fire and Rescue Department is responsible for emergency management.
Maintenance programs to reduce risk (stormwater maintenance, tree trimming, etc.)	Yes	Stormwater Credit Program which incentivizes stormwater treatment and water supply projects.
Mutual aid agreements	No	-
Human Resources Manual - Do any job descriptions specifically include identifying or implementing mitigation projects or other efforts to reduce natural hazard risk?	No	-
Other	No	-
TECHNICAL/STAFFING CAPABILITY		
Planners or engineers with knowledge of land development and land management practices	Yes	Planning and Building Department
Engineers or professionals trained in building or infrastructure construction practices	Yes	Planning and Building Department
Planners or engineers with an understanding of natural hazards	Yes	Planning and Building Department
Staff with expertise or training in benefit/cost analysis	No	-
Professionals trained in conducting damage assessments	Yes	Emergency Management and Preparedness Division within the Fire and Rescue Department conducts damage assessments.
Personnel skilled or trained in GIS and/or Hazus applications	No	-
Staff that work with socially vulnerable populations or underserved communities	No	-
Public Information Officer	Yes	Public Information Officer within the Communications Division of the City Manager's Office.
Surveyors	No	-
Emergency manager	Yes	Emergency Management and Preparedness Division within the Fire and Rescue Department.
CRS Coordinator	No	The Public Works Department is responsible for the City's CRS program.
Resilience Officer	No	-
Other (this could include stormwater engineer, environmental specialist, etc.)	No	-

2.3.4 Fiscal Capability

Table 2-5 summarizes financial resources available to the City of Anaheim.

Table 2-5. Fiscal Capabilities

Financial Resources	Accessible or Eligible to Use?
Community Development Block Grants (CDBG, CDBG-DR)	Yes – Eligible
Capital improvement project funding	Yes – Accessible
Authority to levy taxes for specific purposes	Yes – Eligible
User fees for water, sewer, gas, or electric service	Yes – Eligible
Impact fees for homebuyers or developers of new development/homes	Yes – Eligible
Stormwater utility fee	Yes – Eligible
Incur debt through general obligation bonds	Yes – Eligible
Incur debt through special tax bonds	Yes – Eligible
Incur debt through private activity bonds	Yes – Eligible
Withhold public expenditures in hazard-prone areas	Yes – Eligible
Other federal or state funding programs	Yes – Eligible
Open Space Acquisition funding programs	Yes – Eligible
Other (for example, Clean Water Act 319 Grants [Nonpoint Source Pollution])	No

2.3.5 Education and Outreach Capability

Table 2-6 summarizes the education and outreach resources available to the City of Anaheim.

Table 2-6. Education and Outreach Capabilities

Outreach Resources	Available?	Comment
Public information officer or communications office	Yes	Public Information Officer within the Communications Division of the City Manager's Office.
Personnel skilled or trained in website development	No	-
Floodplain management information available on your website	Yes	Local Hazard Mitigation Plan information on City website.
Social media for floodplain management education and outreach	No	-
Citizen boards or commissions that address issues related to floodplain management	Yes	Emergency Management and Preparedness Division within the Fire and Rescue Department.
Warning systems for hazard events	No	-
Natural disaster/safety programs in place for schools	No	-
Organizations that conduct outreach to socially vulnerable populations and underserved populations	No	-
Public outreach mechanisms / programs to inform citizens on natural hazards, risk, and ways to protect themselves during such events	No	-

2.3.6 Community Classifications

Table 2-7 summarizes classifications for community programs available to the City of Anaheim.

Table 2-7. Community Classifications

Program	Participating?	Classification	Date Classified
Community Rating System (CRS)	Yes	7	October 1,1991
Building Code Effectiveness Grading Schedule (BCEGS)	Yes	Class 3 Residential; Class 4 Commercial	1995
Public Protection (ISO Fire Protection Classes 1 to 10)	Yes	Class 2	1990
National Weather Service StormReady Certification	Yes	-	July 1, 2005
Firewise Communities classification	Yes	-	April 15, 2010
Other: Organizations with mitigation focus (advocacy group, non-government)	No	-	-

— = Unavailable

2.3.7 Adaptive Capacity

Adaptive capacity is defined as “the ability of systems, institutions, humans and other organisms to adjust to potential damage, to take advantage of opportunities, or respond to consequences” (IPCC 2022). Each jurisdiction has a unique combination of capabilities to adjust to, protect from, and withstand a future hazard event, future conditions, and changing risk. Table 2-8 summarizes the adaptive capacity for each identified hazard of concern and the City’s capability to address related actions using the following classifications:

- Strong: Capacity exists and is in use.
- Moderate: Capacity might exist; but is not used or could use some improvement.
- Weak: Capacity does not exist or could benefit from a higher level of improvement

Table 2-8. Adaptive Capacity

Hazard	Adaptive Capacity - Strong/Moderate/Weak
Flood	Moderate
Riverine Flood	Moderate
Coastal Flood	Strong
Sea Level Rise	Strong
Tsunami	Strong
Dam Failure	Weak

2.4 NATIONAL FLOOD INSURANCE PROGRAM COMPLIANCE

This section provides specific information on the management and regulation of the regulatory floodplain, including current and future compliance with the National Flood Insurance Program (NFIP). The floodplain administrator listed in Table 2-1 is responsible for maintaining this information.

2.4.1 NFIP Statistics

Table 2-9 summarizes the NFIP policy and claim statistics for the City of Anaheim.

Table 2-9. City of Anaheim NFIP Summary of Policy and Claim Statistics

# Claims (Losses)	**0**
Total Loss Payments	**$0.00**
# Repetitive Loss Properties (NFIP definition)	**0**
# Repetitive Loss Properties (FMA definition)	**0**
# Severe Repetitive Loss Properties (NFIP definition)	**0**
# Severe Repetitive Loss Properties (FMA definition)	**0**

NFIP Definition of Repetitive Loss: The NFIP defines a repetitive loss property as any insurable building for which two or more claims of more than $1,000 were paid by the NFIP within any rolling 10-year period since 1978.

FMA Definition of Repetitive Loss: FEMA's Flood Mitigation Assistance (FMA) program defines a repetitive loss property as any insurable building that has incurred flood-related damage on two occasions, in which the cost of the repair, on average, equaled or exceeded 25 percent of the market value of the structure at the time of each such flood event.

Definition of Severe Repetitive Loss: A residential property covered under an NFIP flood insurance policy and: (a) That has at least four NFIP claim payments over $5,000 each, and the cumulative amount of such claims payments exceeds $20,000; or (b) For which at least two separate claims payments have been made with the cumulative amount of the building portion of such claims exceeding the market value of the building. At least two of the claims must have occurred within any 10-year period, more than 10 days apart.

Source: FEMA, 2025

2.4.2 Flood Vulnerability Summary

Table 2-10 provides a summary of the NFIP program in the City of Anaheim.

Table 2-10. NFIP Summary

NFIP Topic	Comments
Flood Vulnerability Summary	
Describe areas prone to flooding in your jurisdiction.	Localized flooding, particularly in West Anaheim, when heavy rainfall occurs, often near underperforming catch basins. No areas that may experience evacuation issues.
Do you maintain a list of properties that have been damaged by flooding?	No, not at this time.
Do you maintain a list of property owners interested in flood mitigation?	No, not at this time.
How many homeowners and/or business owners are interested in mitigation (elevation or acquisition)?	Unknown, at this time.
Are any RiskMAP projects currently underway in your jurisdiction? If so, state what projects are underway.	Unknown, at this time.
How do you make Substantial Damage determinations?	Unknown, at this time.
How many Substantial Damage determinations were declared for recent flood events in your jurisdiction?	None, at this time
How many properties have been mitigated (elevation or acquisition) in your jurisdiction? If there are mitigation properties, how were the projects funded?	Unknown, at this time.
Do your flood hazard maps adequately address the flood risk within your jurisdiction? If not, state why.	Yes, the flood maps adequately address flood risk within the jurisdictions at this time.

NFIP Topic	Comments
NFIP Compliance	
What local department is responsible for floodplain management?	Department of Planning and Building
Are any certified floodplain managers on staff in your jurisdiction?	No, just the Planning department.
Do you have access to resources to determine possible future flooding conditions from climate change?	Yes, the City utilizes federal resources to determine possible flooding conditions.
Does your floodplain management staff need any assistance or training to support its floodplain management program? If so, what type of assistance/training is needed?	None, at this time.
Provide an explanation of NFIP administration services you provide (e.g., permit review, GIS, education/outreach, inspections, engineering capability)	Planning maintains relevant online resources (Flood Zones & Flood Hazard Awareness | Anaheim, CA - Official Website); Planning & Building and Public Works Departments assists applicants in processing elevation, flood proofing, and other required construction certificates; and the City participates in the NFIP Community Rating System which includes providing certain public information and outreach activities.
How do you determine if proposed development on an existing structure would qualify as a substantial improvement?	A.M.C. Chapters 17.28 (Flood Hazard Reduction) and 18.28 (Floodplain "FP" Overlay Zone) definitions and processes are consistent with NFIP standards and are reviewed by FEMA as part of the City's participation in the NFIP CRS Program.
What are the barriers to running an effective NFIP program in the community, if any?	Challenges with staff availability and funding.
Does your jurisdiction have any outstanding NFIP compliance violations that need to be addressed? If so, state the violations.	No, not at this time.
When was the most recent Community Assistance Visit (CAV) or Community Assistance Contact (CAC)?	CAC in 2021 and CAV in 2022
What is the local law number or municipal code of your flood damage prevention ordinance?	Title 17 Land Development and Resources, Chapter 17.28 Flood Hazard Reduction; Title 18 Zoning, Chapter 18.28 – Floodplain (FP) Overlay Zone; August 24, 2021
What is the date that your flood damage prevention ordinance was last amended?	June 15, 2022.
Does your floodplain management program meet or exceed minimum requirements? If exceeds, in what ways?	The City is a CRS community so it exceeds the NFIP requirements.
Are there other local ordinances, plans or programs (e.g., site plan review) that support floodplain management and meeting the NFIP requirements? For instance, does the planning board or zoning board consider efforts to reduce flood risk when reviewing variances such as height restrictions?	No, not at this time.
Does your community plan to join the CRS program or is your community interested in improving your CRS classification?	The City actively participates in the NFIP CRS Program and seeks to maintain its current CRS classification.

2.5 GROWTH/DEVELOPMENT TRENDS

Understanding how past, current, and projected development patterns have or are likely to increase or decrease risk in hazard areas is a key component to appreciating a jurisdiction's overall risk to its hazards of concern. Recent and expected future development trends, including major residential/commercial development and major infrastructure development, are summarized in Table 2-11 through Table 2-13.

Table 2-11. Number of Building Permits for New Construction Issued Since 2020

	New Construction Permits Issued			
	Single Family	Multi-Family	Other (commercial, mixed-use, etc.)	Total
2020				
Total Permits	The City did not provide any permit information for the purpose of this FMP.			
Permits within SFHA				
2021				
Total Permits	The City did not provide any permit information for the purpose of this FMP.			
Permits within SFHA				
2022				
Total Permits	The City did not provide any permit information for the purpose of this FMP.			
Permits within SFHA				
2023				
Total Permits	The City did not provide any permit information for the purpose of this FMP.			
Permits within SFHA				
2024				
Total Permits	The City did not provide any permit information for the purpose of this FMP.			
Permits within SFHA				

SFHA = Special Flood Hazard Area (1% flood event)

Table 2-12. Recent Major Development and Infrastructure from 2020 to Present

Property or Development Name	Type of Development	# of Units / Structures	Location (address and/or block and lot)	Known Hazard Zones*	Description / Status of Development
No recent major development.					

* Only location-specific hazard zones or vulnerabilities identified.

Table 2-13. Known or Anticipated Major Development and Infrastructure in the Next Five Years

Property or Development Name	Type of Development	# of Units / Structures	Location (address and/or block and lot)	Known Hazard Zones*	Description / Status of Development
No known or anticipated major development.					

2.6 JURISDICTIONAL RISK ASSESSMENT

The hazard profiles in Volume I provide detailed information regarding each planning partner's vulnerability to the identified hazards, including summaries of the City of Anaheim's risk assessment results and data used to determine the hazard ranking. Key local risk assessment information is presented below.

2.6.1 Hazard Area

Maps of hazard areas in the City are shown in Figure 2-1 and Figure 2-2. These maps are based on the best available data at the time of the preparation of this plan and are adequate for planning purposes. Maps are provided only for hazards that can be identified clearly using mapping techniques and technologies and for which Orange County has significant exposure. The maps show the location of potential new development, where available.

Figure 2-1. City of Anaheim Dam Inundation and FEMA Flood Hazard Area Extent and Location Map

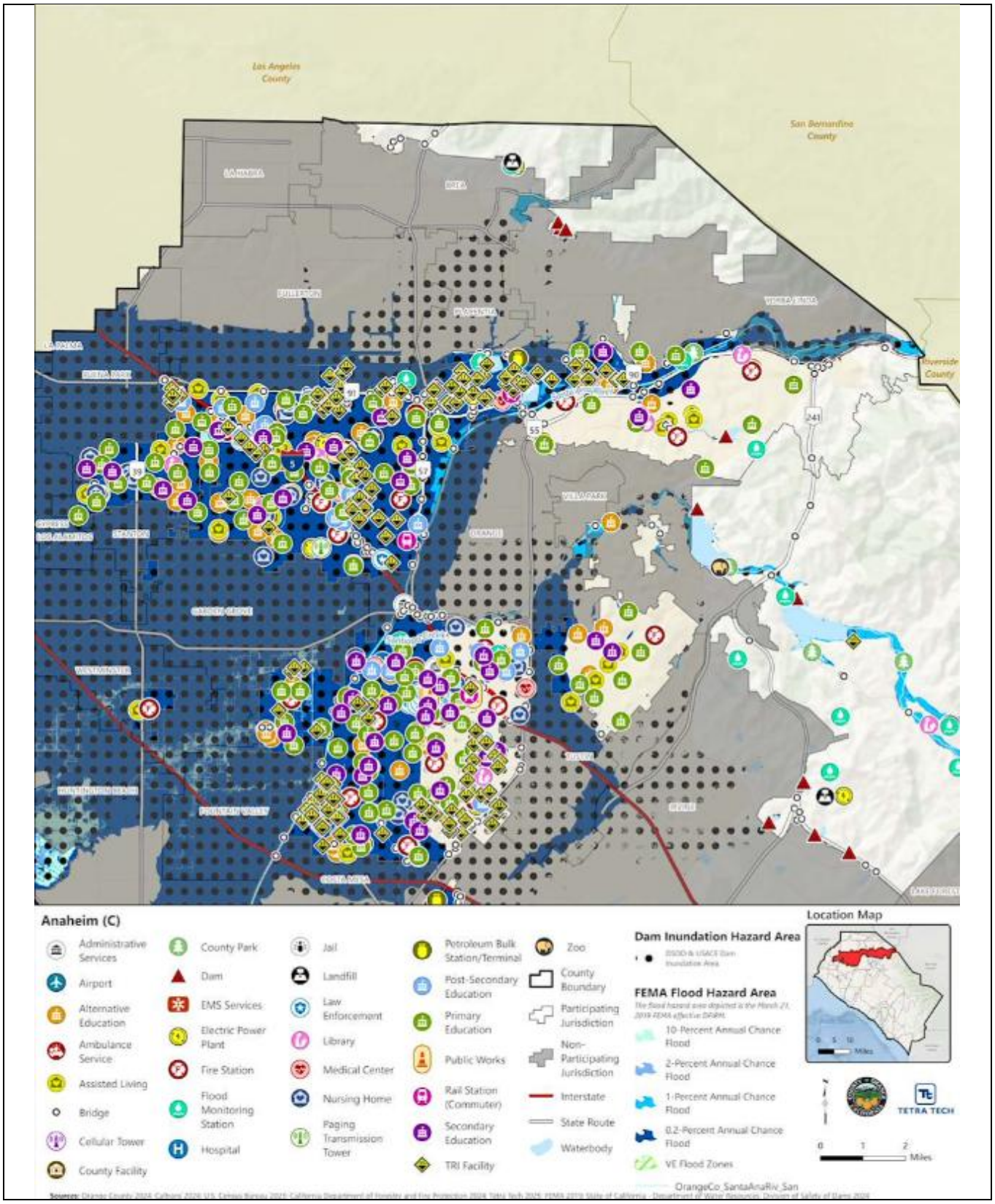
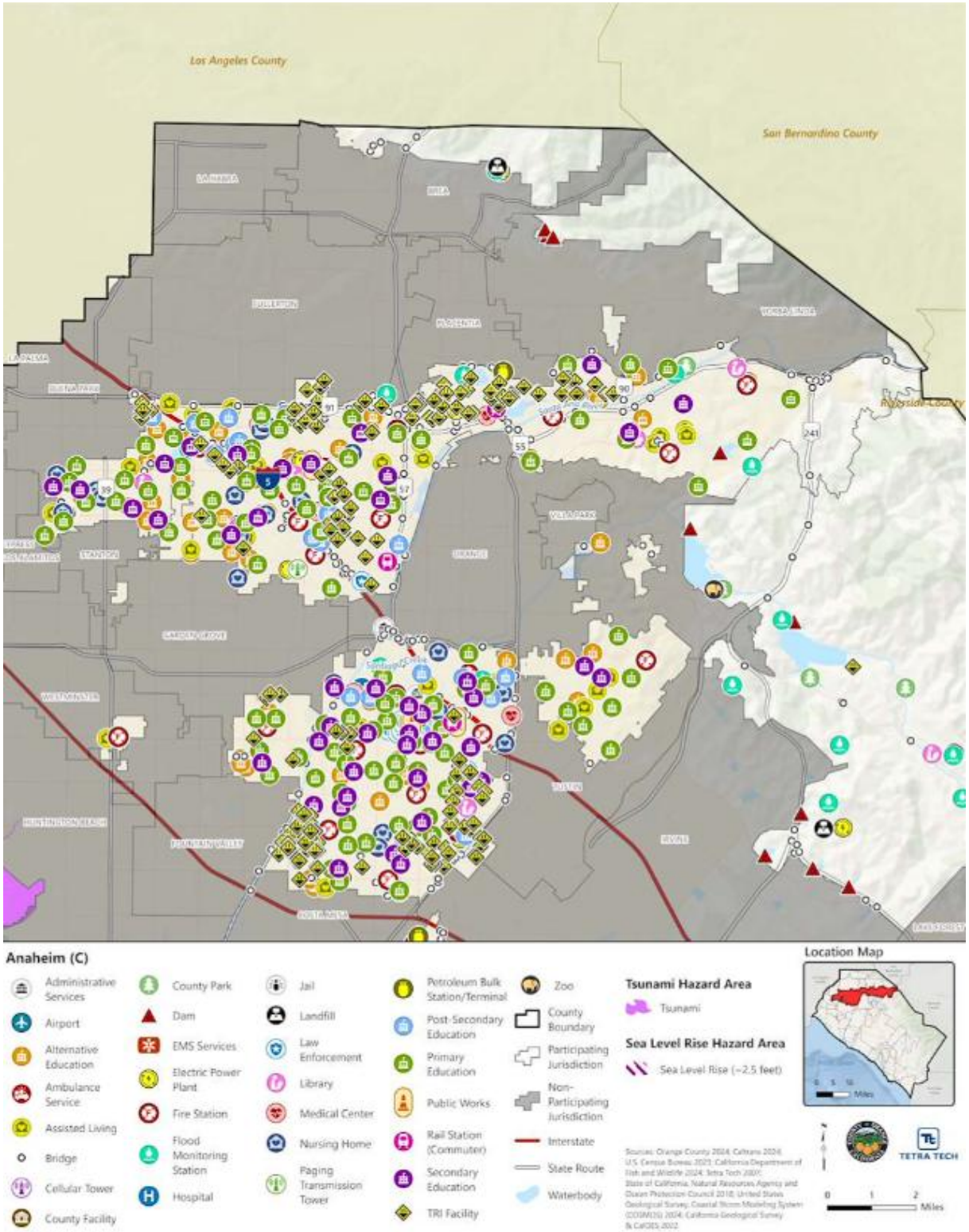


Figure 2-2. City of Anaheim Tsunami and Sea Level Rise Hazard Area Extent and Location Map



2.6.2 Hazard Event History

The history of natural and non-natural hazard events in Orange County is detailed in Volume I, where each hazard profile includes a chronology of historical events that have affected the County and its municipalities. Table 2-14 provides details on loss and damage in the City of Anaheim during hazard events since 2020.

Table 2-14. Hazard Event History in City of Anaheim

Dates of Event	Event Type (Disaster Declaration)	Summary of Event	Summary of Damage and Losses in Anaheim
September 16, 2015	-	An 8.3 magnitude earthquake off Chile's coast on the 16th prompted a tsunami advisory from Orange County to north of San Luis Obispo. Beaches, harbors, piers, and marinas in several cities, including Seal Beach and Huntington Beach, were closed through the 17th. Tsunami waves under one foot were observed along the Orange County coast. The Orange County EOC reported no significant flooding but warned of strong currents and dangerous waves.	No impacts were recorded for the City.
January 18, 2017 – January 23, 2017	DR-4305-CA	Severe winter storm, mudslides, and flooding occurred throughout the region. Water damage and disruptions were seen in the County.	No impacts were recorded for the City.
January 22, 2017	-	Heavy rain caused flash flooding across Orange County, resulting in $100,000 in property damages. A water rescue took place on Hamilton Ave. at the Santa Ana River in Huntington Beach. Streets from Sunset Beach to Santa Ana to Newport Beach were flooded with 1-3 feet of water. Many vehicles were stranded in floodwaters, including several along Highway 55.	No impacts were recorded for the City.
February 17, 2017	-	Flood waters from the East Garden Grove-Wintersburg Channel overflowed, causing $50,000 in property damages and flooding a mobile home park.	No impacts were recorded for the City.
May 24, 2017	-	High tides of 6.5 feet caused minor street flooding and $10,000 in property damages on Balboa Island, with some water entering houses near 36th and Finley Streets. The flooding was exacerbated by the recent demolition of a protective sea wall.	No impacts were recorded for the City.
October 7, 2017	-	Lifeguards reported 6-8 ft surf on the 7th and 8th in Newport and Huntington Beach, with peak waves of 15 ft at the Wedge. Coastal flooding during high tide on the Balboa Peninsula in Newport Beach caused $25,000 in property damages. The beach parking lot, nearby streets, and homes were flooded, and several cars were swamped. In Capistrano Beach, large waves shattered a window in a home.	No impacts were recorded for the City.
February 13, 2019	-	Flash flooding occurred in Laguna Beach with up to 2 inches of rain in 3 hours inundated storm channels, causing $80,000 in property damages. Streets were closed, and homes were threatened by the rising waters.	No impacts were recorded for the City.
April 6, 2020	-	Heavy rainfall occurred in San Juan Capistrano which resulted in one inch of rain in just 20 minutes. In Silverado Canyon, 0.88 of rain was reported in 1 hour from two rain gauges.	No impacts were recorded for the City.

Dates of Event	Event Type (Disaster Declaration)	Summary of Event	Summary of Damage and Losses in Anaheim
July 3, 2020	-	High tide near 6.8 feet and high surf caused minor coastal flooding in Newport Beach, resulting in $40,000 in property damages. Flooding extended up to three blocks inland, and a sailboat was washed ashore and destroyed.	No impacts were recorded for the City.
March 10, 2021	-	Mud and debris flows from the Bond Fire caused $75,000 in property damages, damaging 8 vehicles and 6 homes. Swift water rescues were performed around 6 to 7 am. Mud covered at least 3 locations on Silverado Canyon Road and at Silverado Cafe, with rainfall rates reaching 0.20 inches in 15 minutes.	No impacts were recorded for the City.
December 14, 2021	-	Debris flows from the Bond Fire scar and Silverado Canyon caused $800,000 in property damages. Santiago Creek Road was blocked by high water and mud, while Jackson Creek Road was flooded with mud and debris. Rainfall rates reached up to 1.2 inches at Irvine Lake and Santiago Canyon.	No impacts were recorded for the City.
January 15, 2022	-	A Tsunami Advisory was issued at 5:03 AM for the Orange County Coast. Wireless Emergency Alerts and sirens were activated. The first wave arrived around 8 AM, causing coastal damage, including a drifting buoy off Huntington Bay.	No impacts were recorded for the City.
January 8, 2023 – January 31, 2023	EM-3591-CA	EM-3591-CA was an emergency declaration for California due to severe winter storms, flooding, and mudslides from January 8 to January 31, 2023. Issued on January 9, 2023, it provided federal assistance to support state, local, and tribal response efforts.	No impacts were recorded for the City.
March 1, 2023	-	Caltrans issued a Sig Alert for flooding at the I-5 and Highway 55 transition, causing $10,000 in property damages. Approximately 0.8 inches of rain fell in the area.	No impacts were recorded for the City.
March 9, 2023 – July 20, 2023	EM-3592-CA	Local media reported coastal flooding up to 18 inches deep near Seal Beach Pier due to high tide and surf. At least one car was swamped, but no damage to homes or businesses was confirmed.	No impacts were recorded for the City.

EM = Emergency Declaration (FEMA); FEMA = Federal Emergency Management Agency; DR = Major Disaster Declaration (FEMA); N/A = Not applicable
Source: NWS, 2024; FEMA, 2024

2.6.3 Hazard Ranking and Vulnerabilities

The hazard profiles in Volume I have detailed information regarding each planning partner's vulnerability to the identified hazards. The following presents key risk assessment results for the City of Anaheim.

Hazard Ranking

The participating jurisdictions have differing degrees of vulnerability to the hazards of concern, so each jurisdiction ranked its own degree of risk to each hazard. The community-specific hazard ranking is based on problems and impacts identified by the risk assessment presented in Volume I. The ranking process involves an assessment of

the likelihood of occurrence for each hazard; the potential impacts of the hazard on people, property, and the economy; community capabilities to address the hazard; and changing future climate conditions.

Table 2-15 shows the City of Anaheim's final hazard rankings for identified hazards of concern. Mitigation action development uses the ranking to target hazards with the highest risk. Hazards with a risk ranking of "low," such as Flood, Sea Level Rise, Riverine Flood, Coastal Flood, and Tsunami, may not present the most risk but remain a concern and mitigation action priority for the County and City of Anaheim. Stakeholder feedback indicates although Flood risk ranking is low, Orange County communities are still focused on addressing mitigation projects related to the hazard. In addition, hazards ranked as "high," such as Dam Failure, does not necessarily indicate a surety of the hazard occurring or a prevalence of high-hazard dams, rather this ranking suggests that if a dam failure were to occur the potential impacts on the people, property, and economy would be very significant. The risk associated with "high" ranking are categorized as low-probability and high-consequence events.

Table 2-15. Hazard Ranking

Hazard	Rank
Flood	Low
Riverine Flood	Low
Coastal Flood	Low
Sea Level Rise	Low
Tsunami	Low
Dam Failure	High

Note: The scale is based on the hazard rankings established in Volume I, modified as appropriate based on review by the jurisdiction

Critical Facilities

Table 2-16 identifies those critical facilities in the community that are located in the 1 percent and 0.2 percent annual chance event floodplains – i.e., Special Flood Hazard Areas (SFHA).

Table 2-16. Critical Facility Exposure to the Special Flood Hazard Area (SFHA)

Name	Type	SFHA Exposure	
		1% Annual Chance Event	0.2% Annual Chance Event
Accountability Commitment Program	Administrative Services	N	Y
City Hall - City of Anaheim	Administrative Services	N	Y
Acaciawood School, Inc.	Alternative Education	N	Y
Al-Ansar Academy	Alternative Education	N	Y
AmeriMont Academy	Alternative Education	N	N
Anaheim Discovery Christian Jr./Sr. High	Alternative Education	N	Y
Anaheim Magnolia Christian School	Alternative Education	N	Y
BelAir Christian School	Alternative Education	N	Y
Calvary Chapel Anaheim School	Alternative Education	N	Y
Cambridge Virtual Academy	Alternative Education	N	Y
Cornelia Connelly School	Alternative Education	N	Y
Ethos Christian Academy	Alternative Education	N	Y
Fairmont Preparatory Academy	Alternative Education	N	Y

Name	Type	SFHA Exposure	
		1% Annual Chance Event	0.2% Annual Chance Event
Fairmont Private School Anaheim Hills CA	Alternative Education	N	Y
Fairmont Private Schools - Historic Anaheim Campus	Alternative Education	N	Y
Frontiers Academy	Alternative Education	N	Y
Hephatha Lutheran School	Alternative Education	N	N
Independence Christian School	Alternative Education	N	Y
Integrity Christian School	Alternative Education	N	Y
Knott Ave Christian Church Early Childhood Dev Center	Alternative Education	N	Y
Magnolia Montessori schools	Alternative Education	N	Y
Minaret Academy	Alternative Education	N	Y
Montessori Education Center	Alternative Education	N	Y
Montessori House of Children	Alternative Education	N	Y
Montessori Learning Center	Alternative Education	N	Y
Open Door Christian Academy	Alternative Education	N	Y
Orange County Christian School	Alternative Education	N	Y
Polaris High	Alternative Education	N	Y
Prince of Peace Lutheran	Alternative Education	N	Y
Servite High School	Alternative Education	N	Y
St. Catherine's Academy	Alternative Education	N	Y
St. Justin Martyr	Alternative Education	N	Y
St. Martin Holy Catholic Church and School	Alternative Education	N	Y
The Islamic Education School	Alternative Education	N	Y
The Montessori Academy of Anaheim	Alternative Education	N	Y
Trinity Lutheran Christian	Alternative Education	N	N
Vineyard Christian School	Alternative Education	N	Y
Zion Lutheran Elementary	Alternative Education	N	Y
ALICE WAY HOMECCARE	Assisted Living	N	Y
ANAHEIM CROWN PLAZA	Assisted Living	N	Y
ANAHEIM VILLA	Assisted Living	N	Y
ARDENT CARE	Assisted Living	N	Y
BLUE SKY MANOR INC	Assisted Living	N	Y
BROOKDALE ANAHEIM	Assisted Living	N	Y
BROOKDALE NOHL RANCH	Assisted Living	N	N
CARNELIAN VILLAS	Assisted Living	N	Y
CASA DE LOS ARBOLES	Assisted Living	N	N
CASA DEL SOL	Assisted Living	N	N
EMERALD COURT	Assisted Living	N	Y
FAMILY CHOICE SENIOR CARE 4	Assisted Living	N	Y
FRANCEL GUEST HOME II	Assisted Living	N	Y
GOLDEN LIFE MANOR	Assisted Living	N	Y

Name	Type	SFHA Exposure	
		1% Annual Chance Event	0.2% Annual Chance Event
GOLDEN TUSCANY CARE	Assisted Living	N	Y
HARBOR HEIGHTS ASSISTED LIVING & MEMORY	Assisted Living	N	Y
KARLTON RESIDENTIAL CARE CENTER	Assisted Living	N	Y
MERIDIAN AT ANAHEIM HILLS, THE	Assisted Living	N	N
SILVER LINING RESIDENTIAL CARE	Assisted Living	N	Y
WALNUT VILLAGE	Assisted Living	N	Y
91-5 HOV CONN – Bridge	Bridge	N	Y
91-55 FASTTRACK – Bridge	Bridge	N	N
ANAHEIM-BARBER CITY CHANNEL - Bridge	Bridge	N	Y
ANAHEIM-N5 ON-RAMP – Bridge	Bridge	N	Y
ATWOOD CHANNEL – Bridge	Bridge	Y	Y
ATWOOD CHANNEL – Bridge	Bridge	Y	Y
BALL RD – Bridge	Bridge	N	Y
BALL ROAD – Bridge	Bridge	N	Y
BROADWAY – Bridge	Bridge	N	Y
BROOKHURST STREET – Bridge	Bridge	N	Y
BROOKHURST STREET – Bridge	Bridge	N	Y
CARBON CANYON CHANNEL – Bridge	Bridge	N	Y
Carbon Canyon Channel (Orangethorpe Ave) - Bridge	Bridge	N	Y
CARBON CANYON DIVERSION CHANNEL - Bridge	Bridge	N	Y
CARBON CANYON DIVERSION CHANNEL - Bridge	Bridge	N	Y
CARBON CANYON DIVERSION CHANNEL - Bridge	Bridge	Y	Y
CARBON CREEK CHANNEL – Bridge	Bridge	N	Y
CARBON CREEK CHANNEL – Bridge	Bridge	N	Y
CARBON CREEK CHANNEL – Bridge	Bridge	N	Y
CARBON CREEK CHANNEL – Bridge	Bridge	Y	Y
CARBON CREEK CHANNEL – Bridge	Bridge	Y	Y
CARBON CREEK CHANNEL – Bridge	Bridge	Y	Y
CARBON CREEK CHANNEL – Bridge	Bridge	N	Y
CARBON CREEK CHANNEL – Bridge	Bridge	Y	Y
CARBON CREEK CHANNEL – Bridge	Bridge	N	Y
CARBON CREEK CHANNEL – Bridge	Bridge	Y	Y
CARBON CREEK CHANNEL – Bridge	Bridge	Y	Y
CARBON CREEK CHANNEL – Bridge	Bridge	N	Y
CARBON CREEK CHANNEL – Bridge	Bridge	Y	Y
CARBON CREEK CHANNEL – Bridge	Bridge	N	Y
CARBON CREEK CHANNEL – Bridge	Bridge	N	Y
CARBON CREEK CHANNEL – Bridge	Bridge	N	Y
CARBON CREEK CHANNEL – Bridge	Bridge	Y	Y

Name	Type	SFHA Exposure	
		1% Annual Chance Event	0.2% Annual Chance Event
DISNEYLAND FLYOVER/BALL ROAD SEPARATION - Bridge	Bridge	N	Y
E ORANGETHORPE AVE OH - Bridge	Bridge	N	Y
E91-MAGNOLIA AV OF – Bridge	Bridge	N	Y
E91-N57 CONNECTOR – Bridge	Bridge	N	Y
E91-N57&S57-W91HOV – Bridge	Bridge	N	Y
E91-S241 CONNECTOR – Bridge	Bridge	N	Y
E91-S5 CONN – Bridge	Bridge	N	Y
EB 91 OFF RAMP – Bridge	Bridge	N	Y
ESPERANZA ROAD SEPARATION - Bridge	Bridge	N	Y
EUCLID STREET – Bridge	Bridge	N	Y
EUCLID-S5 ON-RAMP – Bridge	Bridge	N	Y
GENE AUTRY WAY – Bridge	Bridge	N	Y
GENE AUTRY WAY – Bridge	Bridge	N	Y
HARBOR BLVD – Bridge	Bridge	N	Y
HARBOR BLVD – Bridge	Bridge	N	Y
HOV-GENE AUTRY WAY – Bridge	Bridge	N	Y
INTERSTATE 5 – Bridge	Bridge	N	Y
INTERSTATE 5 – Bridge	Bridge	N	Y
INTERSTATE 5 – Bridge	Bridge	Y	Y
KATELLA-N5 ON-RAMP – Bridge	Bridge	N	Y
KRAEMER BLVD – Bridge	Bridge	N	Y
LA PALMA AVE – Bridge	Bridge	N	Y
LA PALMA AVE – Bridge	Bridge	N	Y
LAKEVIEW AVE – Bridge	Bridge	N	N
LAKEVIEW AVE OH – Bridge	Bridge	N	Y
LEMON STREET – Bridge	Bridge	N	Y
LINCOLN AVE – Bridge	Bridge	N	Y
LINCOLN AVE – Bridge	Bridge	N	Y
MAGNOLIA AVENUE OH – Bridge	Bridge	N	Y
METROLINK/ BNSF RY – Bridge	Bridge	N	Y
MIRALOMA AVE – Bridge	Bridge	N	Y
N241-E91 CONNECTOR – Bridge	Bridge	N	N
N241-W91 CONNECTOR – Bridge	Bridge	N	N
N55-W91 CONNECTOR – Bridge	Bridge	N	N
N55-W91 CONNECTOR – Bridge	Bridge	N	N
N57-E91 CONNECTOR – Bridge	Bridge	N	Y
N57-W91 CONN RAMP – Bridge	Bridge	N	Y
N5-BRKHURST OFF-RA – Bridge	Bridge	N	Y

Name	Type	SFHA Exposure	
		1% Annual Chance Event	0.2% Annual Chance Event
NB DISNEYLAND DRIVE OC - Bridge	Bridge	N	Y
NORTHERLY SPANS DISNEYAND FLYOVER - Bridge	Bridge	N	Y
PLACENTIA AVE – Bridge	Bridge	N	Y
RIVERDALE AVE – Bridge	Bridge	N	Y
ROSE DRIVE OH – Bridge	Bridge	N	Y
S57-E91 CONNECTOR – Bridge	Bridge	N	Y
S5-BALL RD OFF-RP – Bridge	Bridge	N	Y
S5-EUCLID STREET – Bridge	Bridge	N	Y
S5-KATELLA OFF-RP – Bridge	Bridge	N	Y
S5-ORANGEWOOD AVE – Bridge	Bridge	N	Y
SANTA ANA RIVER CHANNEL - Bridge	Bridge	N	Y
SANTA ANA RIVER CHANNEL - Bridge	Bridge	N	Y
SANTA ANA RIVER CHANNEL - Bridge	Bridge	N	Y
SANTA ANA RIVER CHANNEL - Bridge	Bridge	N	Y
SANTA ANA RIVER CHANNEL - Bridge	Bridge	N	Y
SANTA ANA RIVER CHANNEL - Bridge	Bridge	N	Y
SANTA ANA STREET – Bridge	Bridge	N	Y
SB DISNEYLAND DRIVE OC – Bridge	Bridge	N	Y
SOUTH STREET – Bridge	Bridge	N	Y
SOUTHERLY SPANS DISNEYLAND FLYOVER - Bridge	Bridge	N	Y
SPRR – Bridge	Bridge	N	Y
SR 241 NB – Bridge	Bridge	N	N
SR 241 SB – Bridge	Bridge	N	N
SR 39 (BEACH BLVD) – Bridge	Bridge	N	Y
SR 90 (IMPERIAL) – Bridge	Bridge	N	Y
SR 90 (IMPERIAL) – Bridge	Bridge	N	Y
STATE ROUTE 57 – Bridge	Bridge	N	Y
STATE ROUTE 57 – Bridge	Bridge	N	Y
STATE ROUTE 57 – Bridge	Bridge	N	Y
STATE ROUTE 57 – Bridge	Bridge	N	Y
STATE ROUTE 57 – Bridge	Bridge	N	Y
STATE ROUTE 90 – Bridge	Bridge	N	Y
STATE ROUTE 91 – Bridge	Bridge	N	Y
STATE ROUTE 91 – Bridge	Bridge	N	Y
STATE ROUTE 91 – Bridge	Bridge	N	Y
STATE ROUTE 91 – Bridge	Bridge	N	Y
STATE ROUTE 91 – Bridge	Bridge	N	Y
STATE ROUTE 91 – Bridge	Bridge	N	Y

Name	Type	SFHA Exposure	
		1% Annual Chance Event	0.2% Annual Chance Event
STATE ROUTE 91 – Bridge	Bridge	Y	Y
STATE ROUTE 91 – Bridge	Bridge	N	N
STATE ROUTE 91 – Bridge	Bridge	N	Y
STATE ROUTE 91 – Bridge	Bridge	N	Y
STATE ROUTE 91 – Bridge	Bridge	N	Y
STATE ROUTE 91 – Bridge	Bridge	N	Y
STATE ROUTE 91 – Bridge	Bridge	N	Y
STATE ROUTE 91 – Bridge	Bridge	N	Y
STATE ROUTE 91 – Bridge	Bridge	N	N
STATE ROUTE 91 – Bridge	Bridge	N	N
STATE ROUTE 91 – Bridge	Bridge	N	Y
STATE ROUTE 91 – Bridge	Bridge	N	Y
STATE ROUTE 91 – Bridge	Bridge	N	N
STATE ROUTE 91 – Bridge	Bridge	N	N
STATE ROUTE 91 – Bridge	Bridge	N	Y
STATE ROUTE 91 EB – Bridge	Bridge	N	N
STATE ROUTE 91 EB – Bridge	Bridge	N	Y
STATE ROUTE 91 EB – Bridge	Bridge	N	N
STATE ROUTE 91 EB – Bridge	Bridge	N	N
STATE ROUTE 91 EB – Bridge	Bridge	N	N
STATE ROUTE 91 WB – Bridge	Bridge	N	Y
STATE ROUTE 91 WB – Bridge	Bridge	N	N
STATE ROUTE 91 WB – Bridge	Bridge	N	N
SUNKIST ST – Bridge	Bridge	N	Y
TUSTIN AVE – Bridge	Bridge	N	Y
W91-S241 CONNECTOR – Bridge	Bridge	N	N
W91-S241 CONNECTOR – Bridge	Bridge	N	N
W91-S57 CONNECTOR – Bridge	Bridge	N	Y
WAGNER AVE – Bridge	Bridge	N	Y
WALNUT CANYON CHANNEL - Bridge	Bridge	N	N
WALNUT CANYON CHANNEL - Bridge	Bridge	N	N
WEST ST-N5 ON RAMP – Bridge	Bridge	N	Y
YORBA LINDA BLVD OH – Bridge	Bridge	N	N
Yorba Regional Park	County Park	N	Y
Walnut Canyon	Dam	N	N
ANAHEIM GT	Electric Power Plant	N	Y
ANAHEIM SOLAR ENERGY PLANT	Electric Power Plant	N	Y
AT&T ANAHEIM	Electric Power Plant	N	Y
CANYON POWER PLANT	Electric Power Plant	N	Y

Name	Type	SFHA Exposure	
		1% Annual Chance Event	0.2% Annual Chance Event
Anaheim Fire Department Disney Station	Fire Station	N	Y
Anaheim Fire Department Station 1	Fire Station	N	Y
Anaheim Fire Department Station 10	Fire Station	N	N
Anaheim Fire Department Station 11	Fire Station	N	Y
Anaheim Fire Department Station 2	Fire Station	N	Y
Anaheim Fire Department Station 3	Fire Station	N	Y
Anaheim Fire Department Station 5	Fire Station	N	Y
Anaheim Fire Department Station 6	Fire Station	N	Y
Anaheim Fire Department Station 7	Fire Station	N	Y
Anaheim Fire Department Station 8	Fire Station	N	N
Anaheim Fire Department Station 9	Fire Station	N	N
Carbon Creek Watershed - Gilbert Retention Basin Hydstra Flood Station	Flood Monitoring Station	N	Y
Carbon Creek Watershed - Miller Basin Hydstra Flood Station	Flood Monitoring Station	N	Y
Carbon Creek Watershed - Placentia Basin Hydstra Flood Station	Flood Monitoring Station	N	Y
Santa Ana River Watershed - Anaheim Hills at Old Weir Canyon Trail Hydstra Flood Station	Flood Monitoring Station	N	N
Santa Ana River Watershed - Miller Basin Hydstra Flood Station	Flood Monitoring Station	N	Y
Santa Ana River Watershed - Yorba Park Hydstra Flood Station	Flood Monitoring Station	N	Y
North County Field Services Office	Law Enforcement	N	Y
Anaheim Library - Canyon Hills Branch	Library	N	N
Anaheim Library - Central Library	Library	N	Y
Anaheim Library - East Anaheim Branch	Library	N	N
Anaheim Library - Euclid Branch	Library	N	Y
Anaheim Library - Haskett Branch	Library	N	Y
Anaheim Library - Ponderosa Joint-Use Branch	Library	N	Y
Anaheim Library - Sunkist Branch	Library	N	Y
Anaheim Global Medical Center	Medical Center	N	Y
Anaheim Regional Medical Center	Medical Center	N	Y
Kaiser Permanente Orange County - Anaheim Medical Center	Medical Center	N	Y
West Anaheim Medical Center	Medical Center	N	Y
ANAHEIM CREST NURSING CENTER	Nursing Home	N	Y
ANAHEIM HEALTHCARE CENTER, LLC	Nursing Home	N	Y
ANAHEIM TERRACE CARE CENTER	Nursing Home	N	Y
BEACH CREEK POST-ACUTE	Nursing Home	N	Y
BUENA VISTA CARE CENTER	Nursing Home	N	Y

Name	Type	SFHA Exposure	
		1% Annual Chance Event	0.2% Annual Chance Event
COVENTRY COURT HEALTH CENTER	Nursing Home	N	Y
HARBOR VILLA CARE CENTER	Nursing Home	N	Y
LA PALMA NURSING CENTER	Nursing Home	N	Y
LEISURE COURT NURSING CENTER	Nursing Home	N	Y
PARK ANAHEIM HEALTHCARE CENTER	Nursing Home	N	Y
PARKVIEW HEALTHCARE CENTER	Nursing Home	N	Y
SUN MAR NURSING CENTER	Nursing Home	N	Y
WALNUT VILLAGE REHABILITATION AND CARE C	Nursing Home	N	Y
WINDSOR GARDENS CONVALESCENT CENTER OF A	Nursing Home	N	Y
AMS Spectrum Holdings, LLC	Paging Transmission Tower	N	Y
TORRANCE LOGISTICS COMPANY	Petroleum Bulk Station/Terminal	N	Y
AMERICAN CAREER COLLEGE-ANAHEIM	Post-Secondary Education	N	Y
BETHESDA UNIVERSITY	Post-Secondary Education	N	Y
BROWNSON TECHNICAL SCHOOL	Post-Secondary Education	N	Y
CALIFORNIA CAREER SCHOOL	Post-Secondary Education	N	Y
COBA ACADEMY	Post-Secondary Education	N	Y
INTERCOAST COLLEGES-SANTA ANA	Post-Secondary Education	N	Y
NORTH ORANGE COUNTY COMMUNITY COLLEGE DISTRICT	Post-Secondary Education	N	Y
PLATT COLLEGE-ANAHEIM	Post-Secondary Education	N	Y
SOUTH BAYLO UNIVERSITY	Post-Secondary Education	N	Y
SOUTHERN CALIFORNIA INSTITUTE OF TECHNOLOGY	Post-Secondary Education	N	Y
UNITED EDUCATION INSTITUTE-ANAHEIM	Post-Secondary Education	N	Y
WEST COAST UNIVERSITY-ORANGE COUNTY	Post-Secondary Education	N	Y
Anaheim Elementary Online Academy	Primary Education	N	Y
Anaheim Hills Elementary	Primary Education	N	N
Barton (Clara) Elementary	Primary Education	N	Y
Canyon Rim Elementary	Primary Education	N	N
Centralia Elementary	Primary Education	N	Y
Cerritos Elementary	Primary Education	N	Y

Name	Type	SFHA Exposure	
		1% Annual Chance Event	0.2% Annual Chance Event
Crescent Elementary	Primary Education	N	N
Danbrook Elementary	Primary Education	N	Y
Dr. Albert Schweitzer Leadership Academy	Primary Education	N	Y
Dr. Jonas E. Salk	Primary Education	N	Y
Dr. Peter Marshall	Primary Education	N	Y
Edison (Thomas) Elementary	Primary Education	N	Y
Franklin (Benjamin) Elementary	Primary Education	N	Y
Gauer (Melbourne A.) Elementary	Primary Education	N	Y
Glenview Elementary	Primary Education	N	Y
Guinn (James M.) Elementary	Primary Education	N	Y
Hansen Elementary	Primary Education	N	Y
Henry (Patrick) Elementary	Primary Education	N	Y
Imperial Elementary	Primary Education	N	N
Jefferson (Thomas) Elementary	Primary Education	N	Y
Juarez (Benito) Elementary	Primary Education	N	Y
Juliette Low School of the Arts	Primary Education	N	Y
Lincoln (Abraham) Elementary	Primary Education	N	Y
Loara Elementary	Primary Education	N	Y
Lord Baden-Powell	Primary Education	N	Y
Madison (James) Elementary	Primary Education	N	Y
Mann (Horace) Elementary	Primary Education	N	Y
Marshall (John) Elementary	Primary Education	N	Y
Mattie Lou Maxwell	Primary Education	N	Y
Nohl Canyon Elementary	Primary Education	N	N
Olive Street Elementary	Primary Education	N	Y
Orange Grove Elementary	Primary Education	N	Y
Palm Lane Global Academy	Primary Education	N	Y
Ponderosa Elementary	Primary Education	N	Y
Price (Adelaide) Elementary	Primary Education	N	Y
Revere (Paul) Elementary	Primary Education	N	Y
Rio Vista Elementary	Primary Education	N	Y
Roosevelt (Theodore) Elementary	Primary Education	N	Y
Ross (Betsy) Elementary	Primary Education	N	Y
Running Springs Academy	Primary Education	N	N
Stoddard (Alexander J.) Elementary	Primary Education	N	Y
Sunkist Elementary	Primary Education	N	Y
Twila Reid Elementary	Primary Education	N	Y
Vibrant Minds Charter	Primary Education	N	Y
Walt Disney	Primary Education	N	Y

Name	Type	SFHA Exposure	
		1% Annual Chance Event	0.2% Annual Chance Event
Westmont Elementary	Primary Education	N	Y
Woodsboro Elementary	Primary Education	N	Y
Public Works - City of Anaheim	Public Works	N	Y
ANAHEIM	Rail Station (Commuter)	N	Y
Anaheim Canyon	Rail Station (Commuter)	N	Y
Anaheim High	Secondary Education	N	Y
Ball Junior High	Secondary Education	N	Y
Brookhurst Junior High	Secondary Education	N	Y
Canyon High	Secondary Education	N	N
Canyon Hills	Secondary Education	N	N
Dale Junior High	Secondary Education	N	Y
El Rancho Charter	Secondary Education	N	N
EPIC Charter (Excellence Performance Innovation Citizenship)	Secondary Education	N	Y
Esperanza High	Secondary Education	N	Y
Katella High	Secondary Education	N	Y
Loara High	Secondary Education	N	Y
Magnolia High	Secondary Education	N	Y
Orange County Workforce Innovation High	Secondary Education	N	Y
Orangeview Junior High	Secondary Education	N	Y
Savanna High	Secondary Education	N	Y
South Junior High	Secondary Education	N	Y
Sycamore Junior High	Secondary Education	N	Y
Western High	Secondary Education	N	Y
ADMIRAL ALUMINUM	TRI Facility	N	Y
ADVANCED SPA DESIGNS	TRI Facility	N	Y
AEROSCIENTIFIC CORPORATION	TRI Facility	N	Y
ALL-BANN ENTERPRISES INC	TRI Facility	N	Y
ALLIED PACIFIC METAL STAMPING	TRI Facility	N	Y
AMERICAN CIRCUIT TECHNOLOGY	TRI Facility	N	Y
AMERICAN FABRICATION CORP	TRI Facility	N	Y
ANAHEIM EXTRUSION CO	TRI Facility	N	Y
ANAHEIM MFG CO	TRI Facility	N	Y
ANAHEIM PLANT 16	TRI Facility	N	Y
ANAHEIM PLATING	TRI Facility	N	Y
APT ELECTRONICS INC	TRI Facility	N	Y
ARTISTIC PLATING & METAL FINIS	TRI Facility	N	Y
BLACK OXIDE IND INC	TRI Facility	N	Y
CENTURY LAMINATORS	TRI Facility	N	Y

Name	Type	SFHA Exposure	
		1% Annual Chance Event	0.2% Annual Chance Event
CENTURY LAMINATORS INC	TRI Facility	N	Y
CLASSIC PLATING INC	TRI Facility	N	Y
CREST COATING INC	TRI Facility	N	Y
CYTEC ENGINEERED MATERIALS	TRI Facility	N	Y
CYTEC ENGINEERED MATERIALS INC	TRI Facility	N	Y
D AIRCRAFT PRODUCTS INC	TRI Facility	N	Y
DIVERSIFIED CPC INTERNATIONAL INC	TRI Facility	N	Y
DYNAMIC DETAILS INC	TRI Facility	N	Y
ECONOLITE CONTROL PRODUCTS IN	TRI Facility	N	Y
ELYSIUM TILES, INC	TRI Facility	N	Y
ENGELHARD WEST INC	TRI Facility	N	Y
EQUISTAR CHEMICALS LP	TRI Facility	N	Y
EVEREST ELECTRONIC EQUIP INCORPORATED	TRI Facility	N	Y
FURON CO	TRI Facility	N	Y
GENERAL MOTORS CORP DELCO RE	TRI Facility	N	Y
H KOCH & SONS	TRI Facility	N	Y
HINDERLITER HEAT TREATING INC	TRI Facility	N	Y
INTERCEM CORPORATION	TRI Facility	N	Y
INTERNATIONAL CIRCUITS & COMPONENTS INC	TRI Facility	N	Y
INTERSTATE ENGINEERING	TRI Facility	N	Y
J G & T QUALITY SPRAY PAINTING J V	TRI Facility	N	Y
J & R METAL FINISHING CO	TRI Facility	N	Y
KCA ELECTRONICS INC	TRI Facility	N	Y
KETEMA INC RODAN DIV	TRI Facility	N	Y
KINSBURSKY BROTHERS SUPPLY INC	TRI Facility	N	Y
KWIKSET CORP	TRI Facility	N	Y
L 3 INTERSTATE ELECTRONICS CORPORATION	TRI Facility	N	Y
LASCO BATHWARE	TRI Facility	N	Y
LEACH INT'L CORP	TRI Facility	N	Y
LITTON SYS INC KESTER SOLDER	TRI Facility	N	Y
MAGNETEK ALS	TRI Facility	N	Y
MAGNETEK ALS	TRI Facility	N	Y
MARCHEM PACIFIC INC	TRI Facility	N	Y
MC CURDY CIRCUITS INC	TRI Facility	N	Y
MCGRAW MANUFACTURING INC	TRI Facility	N	Y
MCP FOODS - FIRMENICH FIRCAL	TRI Facility	N	Y
MEDTRONIC CARDIOPULMONARY DIV	TRI Facility	N	Y
METAL POWDER PRODUCTS	TRI Facility	N	Y
MILES CHEMICAL CO INC	TRI Facility	N	Y

Name	Type	SFHA Exposure	
		1% Annual Chance Event	0.2% Annual Chance Event
MONITOR PLATING	TRI Facility	N	Y
MULTI-FINELINE ELECTRONIX INC	TRI Facility	N	Y
MURRIETTA CIRCUITS	TRI Facility	N	Y
NATURAL STONE RESOURCES INC.	TRI Facility	N	Y
NELCO PRODS INC	TRI Facility	N	Y
NELCO PRODUCTS INC	TRI Facility	N	Y
NELCO PRODUCTS, INC.	TRI Facility	N	Y
NEUTRON PLATING INC	TRI Facility	N	Y
NEVILLE CHEMICAL CO	TRI Facility	N	Y
NOR-CAL BEVERAGE COMPANY, INC.	TRI Facility	N	Y
NORTHROP GRUMMAN CORPORATION Y12	TRI Facility	N	Y
ORANGE COUNTY COLOR GRAPHICS	TRI Facility	N	Y
ORMAN GRUBB COMPANY	TRI Facility	N	Y
POWER PARAGON INC	TRI Facility	N	Y
RGF ENTERPRISES INC	TRI Facility	N	Y
ROTO-DIE COMPANY INC	TRI Facility	N	Y
RYVEC INC	TRI Facility	N	Y
S & S PLATING	TRI Facility	N	Y
SAINT-GOBAIN CERAMIC MATERIALS / INNOVATIVE ORGANICS	TRI Facility	N	Y
SDC COATINGS INC	TRI Facility	N	Y
SEAGATE RECORDING MEDIA	TRI Facility	N	Y
SECHRIST INDUSTRIES INC	TRI Facility	N	Y
SIEMENS INFORMATION SYS INC	TRI Facility	N	Y
SKS INC ANAHEIM DIVISION	TRI Facility	N	Y
SMART ELECTRONICS	TRI Facility	N	Y
STEPAN COMPANY	TRI Facility	N	Y
SYSTEM BIO-INDUSTRIES ANAHEIM	TRI Facility	N	Y
TAYLOR-DUNN MFG CO	TRI Facility	N	Y
TEXTURE DESIGN FURNITURE INC	TRI Facility	N	Y
THE BOEING COMPANY	TRI Facility	N	Y
THERMECH ENG CORP	TRI Facility	N	Y
TRAVIS INDUSTRIES INC	TRI Facility	N	Y
TTM TECHNOLOGIES NORTH AMERICA, LLC	TRI Facility	N	Y
US FILTER CONTINENTAL WESTERN WATER CONDITIONING	TRI Facility	N	Y
VM SERVICES INC	TRI Facility	N	Y
WEARTECH INTERNATIONAL INC	TRI Facility	N	Y
WELLER-WHITE CHEM INC	TRI Facility	N	Y
WEYERHAEUSER	TRI Facility	N	Y

Name	Type	SFHA Exposure	
		1% Annual Chance Event	0.2% Annual Chance Event
WILLARD MARINE INCORPORATED	TRI Facility	N	Y
XERXES CORP	TRI Facility	N	Y
ZAC IND	TRI Facility	N	Y

Source: California Department of Education 2024; Caltrans 2024; HIFLD 2022, 2023, 2024; Orange County 2022, Orange County Sheriff's Department 2024; U.S. Geological Survey 2024; USACE 2024
Note: N = Facility is NOT exposed to the SFHA Zone (1% / 0.2%).
Y = Facility IS exposed to the SFHA Zone (1% / 0.2%).

Dam Hazard Vulnerability

The U.S. Army Corps of Engineers (USACE) operates and maintains approximately 740 dams across the United States, providing benefits such as flood risk management, water supply, hydropower, and environmental stewardship (USACE 2021). USACE classifies its dams into five Dam Safety Action Classes (DSAC), ranging from DSAC I (highest risk) to DSAC V (lowest risk), based on factors like event probability, probability of failure, and potential consequences (USACE 2010). This risk-informed approach ensures that dam safety decisions prioritize life safety and effective resource allocation (USACE 2021). Refer to Table 2-17 for the USACE dams located in the City of Anaheim.

Table 2-17. USACE Dams and Estimated Population Located in Dam Inundation Area for City of Anaheim

Dam Name	Total Population (2020 Decennial)	Estimated Number of People Located in Dam Inundation Area	Estimated Percent Total of People Located in Dam Inundation Area
Brea Dam	346,824	18	<0.1%
Carbon Canyon Dam	346,824	186,388	53.7%
Fullerton Dam	346,824	578	0.2%
Prado Dam	346,824	272,715	78.6%
Whittier Dam	346,824	0	0.0%

Source: U.S. Census Bureau 2020; USACE 2024

The California Division of Safety of Dams (DSOD) oversees the design, construction, and maintenance of over 1,200 jurisdictional-sized dams in California (CA DWR 2025). Established in 1929, DSOD ensures dam safety by conducting annual inspections, reviewing structural and hydrological analyses, and approving modifications to existing dams. Dams are classified based on their downstream hazard potential, which ranges from high to low, reflecting the potential impact on life and property in the event of a failure (CA Office of Emergency Services GIS 2020). This classification system helps prioritize safety measures and resource allocation to protect communities and infrastructure. Refer to Table 2-18 for the CA DSOD dams located in the City of Anaheim.

Table 2-18. CA DSOD Dams and Population in Dam Inundation Area for City of Anaheim

Dam Name	Total Population (2020 Decennial)	Estimated Number of People Located in Dam Inundation Area	Estimated Percent Total of People Located in Dam Inundation Area
Big Canyon Dam	346,824	0	0.0%
Diemer Dam	346,824	0	0.0%
Deimer No.8 Dam	346,824	0	0.0%
Deimer Ozone Dam	346,824	0	0.0%
Dove Canyon Dam	346,824	0	0.0%
Harbor View Dam	346,824	0	0.0%
Mission Viejo Dam	346,824	0	0.0%
Lower Peters Canyon Dam	346,824	0	0.0%
Peters Canyon Dam	346,824	0	0.0%
Portola Dam	346,824	0	0.0%
Rattlesnake Dam	346,824	0	0.0%
Rossmoor Dam	346,824	0	0.0%
San Joaquin Dam	346,824	0	0.0%
Sand Canyon	346,824	0	0.0%
Santiago Dam	346,824	0	0.0%
Sulphur Creek Dam	346,824	0	0.0%
Syphon Dam	346,824	0	0.0%
Trampas Dam	346,824	0	0.0%
Upper Chiquita Dam	346,824	0	0.0%
Upper Oso Dam	346,824	0	0.0%
Villa Park Dam	346,824	0	0.0%
Walnut Dam	346,824	3,757	1.1%
Yorba Dam	346,824	2,378	0.7%

Source: U.S. Census Bureau 2020; State of California - Department of Water Resources, Division of Safety of Dams 2024

2.6.4 Identified Issues

After review of the City of Anaheim's hazard event history, hazard rankings, hazard location, and current capabilities, the City identified the following vulnerabilities within the community:

- The City does not have an adopted substantial damage management plan.
- La Palma Ave. and Fairview St. - Street flooding in Residential Streets adjacent to La Palma Ave. and extensive street flooding in La Palma Ave.
- Street flooding in West Anaheim due to restrictions in the Storm drain system or backwater effects from County Channels. However, typically restricted to street flooding.

2.7 MITIGATION STRATEGY AND PRIORITIZATION

The City of Anaheim participated in the mitigation strategy workshop for this FMP to identify appropriate actions to include in a mitigation action catalogue. Its comprehensive consideration of all possible activities to address flood-related hazards of concern included review of the six CRS action categories:

- **Property Protection (PP)** -These actions include public activities to reduce hazard losses or actions that involve (1) modification of existing buildings or structures to protect them from a flood hazard or (2) removal of structures from the flood hazard area.
- **Preventative Measures (PR)** - Government, administrative, or regulatory actions, or processes that influence the way land and buildings are developed and built. Examples include planning and zoning, capital improvement plans, etc.
- **Public Information (PI)** - Actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them.
- **Natural Resource Protection (NPR)** - Actions that minimize flood hazard loss and preserve or restore the functions of natural systems.
- **Structural Flood Control Project (SP)** - Actions that involve the construction of structures to reduce the impact of a flood hazard. Such structures include dams, setback levees, floodwalls, retaining walls, and safe rooms.
- **Emergency Services (ES)** - Actions that protect people and property during and immediately following a disaster or flood related hazard event. Services include warning systems, emergency response services, and the protection of essential facilities.

The action worksheets included at the end of this annex list the mitigation actions that the City of Anaheim would like to pursue in the future to reduce the effects of flood-related hazards. The actions are dependent upon available funding (grants and local match availability) and may be modified or omitted at any time based on the occurrence of new flood-related hazard events and changes in City priorities. Action summary information is provided in Table 2-19.

Volume I identifies 14 evaluation criteria for prioritizing the mitigation actions. To assist with rating each mitigation action as high, medium, or low priority, a numeric rank is assigned (-1, 0, or 1) for each of the evaluation criteria. Table 2-20 provides a summary of the prioritization of all proposed mitigation actions for the FMP.

Table 2-19. Mitigation Action Summary

Project Number	Project Name	Flood Hazard	Responsible Party	Brief Summary of the Problem and the Solution (Project)	CRS Category
2025-Anaheim-FMP1	Substantial Damage Management Plan	All Flooding Hazards	Planning and Building Department	The City does not have an adopted substantial damage management plan. The Planning and Building Department will develop a Substantial Damage Management Plan, following the six step planning process in 2021 Developing a Substantial Damage Management Plan (https://crsresources.org/files/500/developing_subst_damge_mgmt_plan.pdf). This plan will outline responsibilities for Substantial Damage determinations, determining market value, and permit approval processes following a disaster event.	PR, PP
2025-Anaheim-FMP2	La Palma Ave and Fairview St. Roadway Elevation Feasibility	All Flooding Hazards	Highway Department	La Palma Ave. and Fairview St. - Street flooding in Residential Streets adjacent to La Palma Ave. and extensive street flooding in La Palma Ave. The City Highway Department will conduct a benefit cost analysis on raising La Palma Ave. and Fairview St. If feasible, the City will propose to raise the roadway 6” to 12” and install shallow drainage structures that will provide additional storage for both stormwater runoff and tidal waters.	SP
2025-Anaheim-FMP3	Upsize Storm Drain System and Backflow Prevention Valve	Flooding, Riverine Flooding	Highway Department	Street flooding in West Anaheim due to restrictions in the Storm drain system or backwater effects from County Channels. However, typically restricted to street flooding. The Highway Department will explore funding availability to increase the size of the storm drain system to increase stormwater storage during flood events. Also, if feasible, the City will install a stormwater backflow prevention valve to help mitigate additional flooding impacts.	SP

Table 2-20. Summary of Prioritization of Actions

Project Number	Project Name	Scores for Evaluation Criteria															High / Medium / Low
		Life Safety	Property Protection	Cost-Effectiveness	Political	Legal	Fiscal	Environmental	Social Vulnerability	Administrative	Hazards of Concern	Climate Change	Timeline	Community Lifelines	Other Local Objectives	Total	
2025-Anaheim-FMP1	Substantial Damage Management Plan	1	1	1	1	1	0	1	1	1	1	1	1	1	0	12	High
2025-Anaheim-FMP2	Fairview St. Roadway Elevation Feasibility	1	1	0	1	1	0	0	1	0	1	1	0	1	0	8	Medium
2025-Anaheim-FMP3	Upsize Storm Drain System and Backflow Prevention Valve	1	1	0	1	1	0	1	1	0	1	1	1	1	0	11	High

Note: Volume I, Section 6 (Mitigation Strategy) conveys guidance on prioritizing mitigation actions. Low (0-6), Medium (7-10), High (11-14).

Action 2025-Anaheim-FMP1. Substantial Damage Management Plan

Lead Agency:	Planning and Building Department
Supporting Agencies:	-
Hazard(s) of Concern:	All Flooding Hazards
Description of the Problem:	The City does not have an adopted substantial damage management plan.
Description of the Solution:	The Planning and Building Department will develop a Substantial Damage Management Plan, following the six step planning process in 2021 *Developing a Substantial Damage Management Plan* (https://crsresources.org/files/500/developing_subst_damge_mgmt_plan.pdf). This plan will outline responsibilities for Substantial Damage determinations, determining market value, and permit approval processes following a disaster event.
Estimated Cost:	Medium
Potential Funding Source:	Annual Budget, State funding opportunities, HMA, CDBG
Implementation Timeline:	Short-term (< 5 years)
Goals Met:	1, 2, 3, 4, 5
Benefits:	High ($100,000)
CRS Category	Preventative Measures, Property Protection, Emergency Services
Priority	High

Action 2025-Anaheim-FMP2. La Palma Ave and Fairview St. Roadway Elevation Feasibility

Lead Agency:	Highway Department
Supporting Agencies:	Planning and Building Department
Hazard(s) of Concern:	All Flooding Hazards
Description of the Problem:	La Palma Ave. and Fairview St. - Street flooding in Residential Streets adjacent to La Palma Ave. and extensive street flooding in La Palma Ave.
Description of the Solution:	The City Highway Department will conduct a benefit cost analysis on raising La Palma Ave. and Fairview St. If feasible, the City will propose to raise the roadway 6” to 12” and install shallow drainage structures that will provide additional storage for both stormwater runoff and tidal waters.
Estimated Cost:	TBD
Potential Funding Source:	HMGP, State funding opportunities
Implementation Timeline:	Longterm (> 5 years)
Goals Met:	1, 2, 3, 4, 5, 6, 7
Benefits:	High ($100,000)
CRS Category	Structural Flood Control Project
Priority	Medium

Action 2025-Anaheim-FMP3. Upsize Storm Drain System and Backflow Prevention Valve

Lead Agency:	Highway Department
Supporting Agencies:	County
Hazard(s) of Concern:	Flooding, Riverine Flooding
Description of the Problem:	Street flooding in West Anaheim due to restrictions in the Storm drain system or backwater effects from County Channels. However, typically restricted to street flooding.
Description of the Solution:	The Highway Department will explore funding availability to increase the size of the storm drain system to increase stormwater storage during flood events. Also, if feasible, the City will install a stormwater backflow prevention valve to help mitigate additional flooding impacts.
Estimated Cost:	Medium
Potential Funding Source:	HMGP, State funding opportunities
Implementation Timeline:	Short-term (< 5 years)
Goals Met:	1, 2, 3, 4, 5
Benefits:	High ($100,000)
CRS Category	Structural Flood Control Project
Priority	High

3. CITY OF LAGUNA WOODS ANNEX

This jurisdictional annex to the Orange County Floodplain Management Plan (FMP) provides information to assist public and private sectors in the unincorporated areas with reducing losses from future hazard events. This annex is not guidance of what to do when a disaster occurs; its focus is on actions that can be implemented prior to a disaster to reduce or eliminate damage to property and people. The annex presents a general overview of the City of Laguna Woods, describes who participated in the planning process, assesses these area's risk, vulnerability, and capabilities, and outlines a strategy for achieving a more resilient community.

3.1 FLOODPLAIN MANAGEMENT PLANNING TEAM

The City of Laguna Woods identified primary and alternate FMP points of contact and developed this plan over the course of several months, with input from many City departments. The Conservation Manager and City Manager represented the community on the Orange County FMP Planning Partnership and supported the local planning process by securing input from persons with specific knowledge to enhance the plan. All departments were asked to contribute to the annex development through reviewing and contributing to the capability assessment, reporting on the status of previously identified actions, and participating in action identification and prioritization.

Table 3-1 summarizes City officials who participated in the development of the annex and in what capacity. Additional documentation of the City's planning activities through Planning Partnership meetings is included in Volume I.

Table 3-1. Floodplain Management Planning Team

Primary Point of Contact	Alternate Point of Contact
Name/Title: Nadia Cook, Planning and Environmental Services Director Address: 24264 El Toro Road, Laguna Woods, CA 92637 Phone Number: (949) 639-0552 Email: ncook@cityoflagunawoods.org	Name/Title: Chris Macon, City Manager Address: 24264 El Toro Road Laguna Woods, CA 92637 Phone Number: N/A Email: cmacon@cityoflagunawoods.org
National Flood Insurance Program Floodplain Administrator	
Name/Title: Planning and Environmental Services Director Address: 24264 El Toro Road, Laguna Woods, CA 92637 Phone Number: (949) 639-0561 Email: planning@cityoflagunawoods.org	
Additional Contributors	
Name/Title: N/A Method of Participation: N/A	

3.2 COMMUNITY PROFILE

3.2.1 Brief History

Laguna Woods is a relatively young city with a unique history. Originally part of the expansive Moulton Ranch in South Orange County, the area was primarily used for dry farming and cattle grazing until the 1960s (Laguna Woods History Center 2025). In 1962, developer Ross Cortese purchased a portion of the ranch to create a retirement community, which became Leisure World Laguna Hills (now Laguna Woods Village) and welcomed its

first residents in 1964. The push for cityhood began in the 1970s and gained momentum in the 1990s due to concerns over county service reductions and the potential development of a commercial airport nearby. Laguna Woods was officially incorporated on March 24, 1999, becoming Orange County's 32nd city. Today, it is known for its senior-oriented residential communities and vibrant commercial centers (Laguna Woods History Center 2025).

3.2.2 Location

Laguna Woods is located in South Orange County, California, just east of Laguna Beach. The city spans approximately three-square miles and is primarily known for its retirement community, Laguna Woods Village. Nestled amidst rolling hills and lush landscapes, Laguna Woods offers a serene environment with easy access to the Pacific Ocean, which is about five miles away. The city is bordered by the expansive Laguna Coast Wilderness Park and is close to the Aliso and Wood Canyons Wilderness Park. This location provides residents with ample opportunities for outdoor activities and enjoying California's natural beauty (City of Laguna Woods 2025).

3.2.3 Governing Body Format

The governing body of Laguna Woods operates under a council-manager system. The City Council, consisting of five elected members, serves as the legislative body responsible for setting policies, passing ordinances, and overseeing the city's budget. Council members are elected at large and serve staggered four-year terms. The Mayor and *Mayor Pro Tem* are selected annually by the City Council from among its members. The City Manager, appointed by the City Council, acts as the chief executive officer, implementing council policies and managing day-to-day operations. This structure ensures that the city's governance is both democratic and efficient, with elected officials providing oversight and professional staff handling administrative functions (City of Laguna Woods 2025).

3.2.4 Population and Social Vulnerability

According to the U.S. Census, the 2020 population for Laguna Woods was 17,644. This is 37.4-percent of the participating jurisdiction population total.

Research has shown that some populations are at greater risk from hazard events because of decreased resources or physical abilities. These populations can be more susceptible to hazard events based on a number of factors including their physical and financial ability to react or respond during a hazard, and the location and construction quality of their housing. Data from the American Community Survey 5-Year Population Estimates indicates that 83 percent is 65 years of age or older, 22.7 percent is non-English speaking, 11.3 percent is below the poverty threshold, and 29.6 percent is considered disabled. Additionally, there are no peoples under the age of 5 located in Laguna Woods according to the American Community Survey 5-Year Population Estimates.

3.3 JURISDICTIONAL CAPABILITY ASSESSMENT AND INTEGRATION

The City of Laguna Woods performed an inventory and analysis of existing capabilities, plans, programs, and policies that enhance its ability to implement mitigation strategies. Volume I describes the components included in the capability assessment and their significance for floodplain management planning. The jurisdictional assessment for this annex includes analyses of the following:

- Planning and regulatory capabilities

- Development and permitting capabilities
- Administrative and technical capabilities
- Fiscal capabilities
- Education and outreach capabilities
- Classification under various community mitigation programs
- Adaptive capacity to withstand hazard events

For a community to succeed in reducing long-term risk, floodplain management must be integrated into day-to-day local government operations. As part of the floodplain management analysis, planning and policy documents were reviewed and each jurisdiction was surveyed to obtain a better understanding of their progress toward plan integration. Development of an updated mitigation strategy provided an opportunity for the City to identify opportunities for integrating mitigation concepts into ongoing City procedures.

3.3.1 Planning and Regulatory Capability and Integration

Table 3-2 summarizes the planning and regulatory tools that are available to the City of Laguna Woods.

Table 3-2. Planning and Regulatory Capability and Integration

	Jurisdiction has this?	Citation and Date (code chapter or name of plan, date of enactment or plan adoption)	Authority (local, county, state, federal)	Responsible Person, Department or Agency
CODES, ORDINANCES, & REGULATIONS				
Building Code	Yes	O-16-03 – Initial Ordinance; O-22-03 – Recent Amendments; Adopted same state codes as Orange County	Local and State	Building Division within the Planning and Environmental Services Department
How does this reduce risk from flood-related hazards? State Building Code Requires Community to Document date of NFIP entrance, and date of first FIRM.				
Zoning/Land Use Code	Yes	13-02-180: Nonconforming Use Sec. Chapter 13-12: Open Space Districts	Local	Planning Division within the Planning and Environmental Services Department
How does this reduce risk from flood-related hazards? Chapter 13-12: Open Space Districts. City has applied their adopted OS-P (Passive Open Space) Zoning district to portions of land within and along Aliso Creek that are also mapped SFHA, Zone AE, to further restrict development within that portion of the City's mapped floodplain. Sect. 13-02-180: Nonconforming Use: Reinforces those uses that pre-date current zoning that sustain > 50% damage must be brought up to current zoning code, specifically citing flood as one of the causes of damage. This allows the City to capture flood damaged structures that are substantially damaged in the zoning ordinance directly, in addition to stipulations contained in the flood protection code.				

	Jurisdiction has this?	Citation and Date (code chapter or name of plan, date of enactment or plan adoption)	Authority (local, county, state, federal)	Responsible Person, Department or Agency
Subdivision Code	Yes	Title 12: Subdivisions	Local	Planning Division within the Planning and Environmental Services Department

How does this reduce risk from flood-related hazards?

12.12.030.(d): Stipulates that units or contiguous units cannot be excluded from subdivision boundaries to avoid public dedications for … flood control….

12.12.130(c): Stipulates that any poles supporting overhead utility lines may not be installed within any flood control channel.

12.12.150(c): Requires that existing or proposed flood control channels be examined with respect to the official flood control plan for the City, and if those channels are within or adjacent to the subdivision, the channel shall be illustrated on the map as a lettered lot in a width and in an alignment corresponding to the flood control plan.

12.12.220: Prohibits plating of flood hazard areas and associated subdivision approval unless the Planning Commission is satisfied [flood] hazards are removed or risk to surrounding uses and properties is mitigated from those risks. Subdivision regulations trigger a required flood protection meeting for all proposed subdivisions in the FP Overlay District(s), which include the submission of flood elevation data and requisite engineering studies.

12.26.030. Adds an additional regulatory check to ensure floodwater drainage control is accounted for on a final plat before any proposed waivers are approved.

Site Plan Code	No	-	-	-
How does this reduce risk from flood-related hazards?				
Stormwater Management Code	Yes	Chapter 4.14. - Water Quality	Local	Planning and Environmental Services Department
How does this reduce risk from flood-related hazards? Chapter 4.14 establishes regulations to prevent water pollution, protect public health, and ensure compliance with National Pollutant Discharge Elimination System (NPDES) permits				
Post-Disaster Recovery/ Reconstruction Code	No	-	-	-
How does this reduce risk from flood-related hazards?				
Real Estate Disclosure Requirements	No	-	-	-
How does this reduce risk from flood-related hazards?				
Growth Management	No	-	-	-
How does this reduce risk from flood-related hazards?				
Environmental Protection Ordinance(s)	No	-	-	-
How does this reduce risk from flood-related hazards?				

	Jurisdiction has this?	Citation and Date (code chapter or name of plan, date of enactment or plan adoption)	Authority (local, county, state, federal)	Responsible Person, Department or Agency
Flood Damage Prevention Ordinance	Yes	Chapter 10.04. Floodplain Management	Local	Planning and Environmental Services Department
How does this reduce risk from flood-related hazards? Chapter 10.04 promotes public health, safety, and general welfare by minimizing flood-related losses through regulations designed to protect human life, reduce property damage, and manage development in flood-prone areas.				
Wellhead Protection	No	-	-	-
How does this reduce risk from flood-related hazards?				
Emergency Management Ordinance	Yes	Chapter 7.04. – Emergency Management	Local	Public Safety Services Department
How does this reduce risk from flood-related hazards? Chapter 7.04 establishes the framework for preparing, responding to, and recovering from emergencies and disasters to protect public health, safety, and property.				
Climate Change Ordinance	No	-	-	-
How does this reduce risk from flood-related hazards?				
Other	No	-	-	-
How does this reduce risk from flood-related hazards?				
PLANNING DOCUMENTS				
Comprehensive/ Master Plan	Yes	City of Laguna Woods General Plan, August 2024	Local	Planning Division within the Planning and Environmental Services Department
How does this reduce risk from flood-related hazards? This Plan is a comprehensive, long-term blueprint to guide physical development, land use, circulation, conservation, housing, noise, open space, and safety, ensuring balanced growth and resource management.				
Capital Improvement Plan	Yes	City of Laguna Woods Capital Improvement Plan FY 2023-34	Local	Engineering and Infrastructure Services Department
How does this reduce risk from flood-related hazards? The CIP is a framework for planning, funding, and implementing infrastructure projects to enhance the City's public facilities, transportation systems, and overall quality of life.				
Disaster Debris Management Plan	Yes	Safety Element - City of Laguna Woods General Plan, August 2024	Local	Planning Division within the Planning and Environmental Services Department
How does this reduce risk from flood-related hazards? The Safety Element of the General Plan aims to identify and address natural and human-caused hazards to protect public health, safety, and property through comprehensive policies and actions.				

	Jurisdiction has this?	Citation and Date (code chapter or name of plan, date of enactment or plan adoption)	Authority (local, county, state, federal)	Responsible Person, Department or Agency
Floodplain Management or Watershed Plan	Yes	Safety Element - City of Laguna Woods General Plan, August 2024	Local	Planning Division within the Planning and Environmental Services Department
How does this reduce risk from flood-related hazards? The Safety Element of the General Plan aims to identify and address natural and human-caused hazards to protect public health, safety, and property through comprehensive policies and actions.				
Stormwater Management Plan	No	-	-	-
How does this reduce risk from flood-related hazards?				
Open Space Plan	Yes	Open Space Element - City of Laguna Woods General Plan, August 2024	Local	Planning Division within the Planning and Environmental Services Department
How does this reduce risk from flood-related hazards? The Open Space Element of the General Plan aims to preserve and enhance open spaces for recreation, conservation, and aesthetic value, ensuring a balanced and sustainable environment for the community.				
Urban Water Management Plan	No	-	-	-
How does this reduce risk from flood-related hazards?				
Habitat Conservation Plan	No	-	-	-
How does this reduce risk from flood-related hazards? N/A				
Habitat Protection/ **Restoration Plan**	No	-	-	-
How does this reduce risk from flood-related hazards? N/A				
Green Infrastructure Plan	No	-	-	-
How does this reduce risk from flood-related hazards? N/A				
Comprehensive/ Community Plan	No	-	-	-
How does this reduce risk from flood-related hazards? N/A				
Agriculture Plan	No	-	-	-
How does this reduce risk from flood-related hazards?				
Climate Action/ Resilience/Sustainability Plan	No	-	-	-
How does this reduce risk from flood-related hazards?				

	Jurisdiction has this?	Citation and Date (code chapter or name of plan, date of enactment or plan adoption)	Authority (local, county, state, federal)	Responsible Person, Department or Agency
Tourism Plan	No	-	-	-
How does this reduce risk from flood-related hazards?				
Business/ Downtown Development Plan	No	-	-	-
How does this reduce risk from flood-related hazards?				
Other	No	-	-	-
How does this reduce risk from flood-related hazards? N/A				
RESPONSE/RECOVERY PLANNING				
Emergency Operations Plan	Yes	City of Laguna Woods Emergency Operations Plan (EOP), 2023	Local	City Manager's Office
How does this reduce risk from flood-related hazards? The EOP manages and sustains an effective local response to emergency situations. This plan aligns with industry standard protocols and addresses specific threats the City may face and it includes guidelines and protocols essential for handling disasters efficiently, such as floods.				
Continuity of Operations Plan	No	-	-	-
How does this reduce risk from flood-related hazards?				
Substantial Damage Response Plan	No	-	-	-
How does this reduce risk from flood-related hazards?				
Threat and Hazard Identification and Risk Assessment	No	-	-	-
How does this reduce risk from flood-related hazards?				
Post-Disaster Recovery Plan	No	-	-	-
How does this reduce risk from flood-related hazards?				
Other	No	-	-	-
How does this reduce risk from flood-related hazards?				

3.3.2 Development and Permitting Capability

Table 3-3 summarizes the capabilities of the City of Laguna Woods to oversee and track development.

Table 3-3. Development and Permitting Capability

	Yes/No	Comment
Do you issue development permits? • **If you issue development permits, what department is responsible?** • **If you do not issue development permits, what is your process for tracking new development?**	Yes	Planning Division of the Planning & Environmental Services Department responsible for issuing development permits. They ensure that development projects comply with the California Environmental Quality Act, the General Plan, and other regulations.
Are permits tracked by hazard area? (For example, floodplain development permits.)	No	Not at this time.
Do you have a buildable land inventory? • **If you have a buildable land inventory, please describe**	No	Not at this time.
Describe the level of buildout in your jurisdiction.	-	The City is almost entirely built out.

3.3.3 Administrative and Technical Capability

Table 3-4 summarizes potential staff and personnel resources available to the City of Laguna Woods and their current responsibilities that contribute to floodplain management.

Table 3-4. Administrative and Technical Capabilities

Resources	Available?	Comment
ADMINISTRATIVE CAPABILITY		
Planning Board	Yes	Planning Division within the Planning and Environmental Services Department.
Zoning Board of Adjustment	No	Land use issues are managed by Planning Division within the Planning and Environmental Services Department.
Planning Department	Yes	Planning Division within the Planning and Environmental Services Department.
Mitigation Planning Committee	No	-
Environmental Board/Commission	No	-
Open Space Board/Committee	No	-
Economic Development Commission/Committee	No	-
Public Works/Highway Department	Yes	Engineering and Infrastructure Services Department.
Construction/Building/Code Enforcement Department	Yes	Planning and Environmental Services Department.
Emergency Management/Public Safety Department	Yes	Public Safety Services Department.
Maintenance programs to reduce risk (stormwater maintenance, tree trimming, etc.)	Yes	Engineering and Infrastructure Services Department.
Mutual aid agreements	No	-
Human Resources Manual - Do any job descriptions specifically include identifying or implementing mitigation projects or other efforts to reduce natural hazard risk?	No	-
Other	No	-

Resources	Available?	Comment
TECHNICAL/STAFFING CAPABILITY		
Planners or engineers with knowledge of land development and land management practices	Yes	Land use issues are managed by Planning Division within the Planning and Environmental Services Department.
Engineers or professionals trained in building or infrastructure construction practices	Yes	Building Division within the Planning and Environmental Services Department and Engineering and Infrastructure Services Department.
Planners or engineers with an understanding of natural hazards	No	-
Staff with expertise or training in benefit/cost analysis	No	-
Professionals trained in conducting damage assessments	Yes	Building Division within the Planning and Environmental Services Department and Engineering and Infrastructure Services Department.
Personnel skilled or trained in GIS and/or Hazus applications	Yes	Available through contract service provider.
Staff that work with socially vulnerable populations or underserved communities	No	-
Public Information Officer	No	-
Surveyors	Yes	Available through contract service provider.
Emergency manager	No	-
CRS Coordinator	No	The City is currently not participating in the CRS Program.
Resilience Officer	No	-
Other (this could include stormwater engineer, environmental specialist, etc.)	No	-

3.3.4 Fiscal Capability

Table 3-5 summarizes financial resources available to the City of Laguna Woods.

3.3.5 Education and Outreach Capability

Table 3-6 summarizes the education and outreach resources available to the City of Laguna Woods.

3.3.6 Community Classifications

Table 3-7 summarizes classifications for community programs available to the City of Laguna Woods.

Table 3-5. Fiscal Capabilities

Financial Resources	Accessible or Eligible to Use?
Community Development Block Grants (CDBG, CDBG-DR)	Yes - Accessible
Capital improvement project funding	Yes - Accessible
Authority to levy taxes for specific purposes	Yes - Accessible

Financial Resources	Accessible or Eligible to Use?
User fees for water, sewer, gas, or electric service	Yes - Accessible
Impact fees for homebuyers or developers of new development/homes	Yes - Accessible
Stormwater utility fee	Yes - Accessible
Incur debt through general obligation bonds	Yes - Accessible
Incur debt through special tax bonds	Yes - Accessible
Incur debt through private activity bonds	Yes - Accessible
Withhold public expenditures in hazard-prone areas	Yes - Accessible
Other federal or state funding programs	Yes - Accessible
Open Space Acquisition funding programs	Yes - Accessible
Other (for example, Clean Water Act 319 Grants [Nonpoint Source Pollution])	No

Table 3-6. Education and Outreach Capabilities

Outreach Resources	Available?	Comment
Public information officer or communications office	No	The City does not have a PIO, public information is generally issued through the City Manager's Office.
Personnel skilled or trained in website development	No	Website development is conducted through a contract service provider.
Floodplain management information available on your website	No	-
Social media for floodplain management education and outreach	No	-
Citizen boards or commissions that address issues related to floodplain management	No	-
Warning systems for hazard events	Yes	AlertOC public alert system.
Natural disaster/safety programs in place for schools	No	-
Organizations that conduct outreach to socially vulnerable populations and underserved populations	No	-
Public outreach mechanisms / programs to inform citizens on natural hazards, risk, and ways to protect themselves during such events	No	-

Table 3-7. Community Classifications

Program	Participating?	Classification	Date Classified
Community Rating System (CRS)	No	-	-
Building Code Effectiveness Grading Schedule (BCEGS)	No	-	-
Public Protection (ISO Fire Protection Classes 1 to 10)	No	-	-
National Weather Service StormReady Certification	No	-	-
Firewise Communities classification	No	-	-
Other: Organizations with mitigation focus (advocacy group, non-government)	No	-	-

— = Unavailable

3.3.7 Adaptive Capacity

Adaptive capacity is defined as "the ability of systems, institutions, humans and other organisms to adjust to potential damage, to take advantage of opportunities, or respond to consequences" (IPCC 2022). Each jurisdiction has a unique combination of capabilities to adjust to, protect from, and withstand a future hazard event, future conditions, and changing risk. Table 3-8 summarizes the adaptive capacity for each identified hazard of concern and the City's capability to address related actions using the following classifications:

- Strong: Capacity exists and is in use.
- Moderate: Capacity might exist; but is not used or could use some improvement.
- Weak: Capacity does not exist or could use substantial improvement

Table 3-8. Adaptive Capacity

Hazard	Adaptive Capacity - Strong/Moderate/Weak
Flood	Moderate
Riverine Flood	Moderate
Coastal Flood	Moderate
Sea Level Rise	Moderate
Tsunami	Moderate
Dam Failure	Weak

3.4 NATIONAL FLOOD INSURANCE PROGRAM COMPLIANCE

This section provides specific information on the management and regulation of the regulatory floodplain, including current and future compliance with the National Flood Insurance Program (NFIP). The floodplain administrator listed in Table 3-1 is responsible for maintaining this information.

3.4.1 NFIP Statistics

Table 3-9 summarizes the NFIP policy and claim statistics for the City of Laguna Woods.

3.4.2 Flood Vulnerability Summary

Table 3-10 provides a summary of the NFIP program in the City of Laguna Woods.

Table 3-9. City of Laguna Woods NFIP Summary of Policy and Claim Statistics

# Claims (Losses)	**0**
Total Loss Payments	**$0.00**
# Repetitive Loss Properties (NFIP definition)	**0**
# Repetitive Loss Properties (FMA definition)	**0**
# Severe Repetitive Loss Properties (NFIP definition)	**0**
# Severe Repetitive Loss Properties (FMA definition)	**0**

NFIP Definition of Repetitive Loss: The NFIP defines a repetitive loss property as any insurable building for which two or more claims of more than $1,000 were paid by the NFIP within any rolling 10-year period since 1978.

FMA Definition of Repetitive Loss: FEMA's Flood Mitigation Assistance (FMA) program defines a repetitive loss property as any insurable building that has incurred flood-related damage on two occasions, in which the cost of the repair, on average, equaled or exceeded 25 percent of the market value of the structure at the time of each such flood event.

Definition of Severe Repetitive Loss: A residential property covered under an NFIP flood insurance policy and: (a) That has at least four NFIP claim payments over $5,000 each, and the cumulative amount of such claims payments exceeds $20,000; or (b) For which at least two separate claims payments have been made with the cumulative amount of the building portion of such claims exceeding the market value of the building. At least two of the claims must have occurred within any 10-year period, more than 10 days apart.

Source: FEMA, 2024.

Table 3-10. NFIP Summary

NFIP Topic	Comments
Flood Vulnerability Summary	
Describe areas prone to flooding in your jurisdiction.	The City has identified one location prone to localized flooding: the intersection of El Toro Road and Avenida Sevilla near Laguna Woods Village Gate 1, which is unable to adequately manage runoff during heavy rain events. The main water body in Laguna Woods associated with riverine flooding is Aliso Creek. The City does not keep a dedicated list of properties damaged by flooding; however, records of permitted work within Special Flood Hazard Areas are maintained through the City's building permit management system.
Do you maintain a list of properties that have been damaged by flooding?	The City does not keep a dedicated list of properties damaged by flooding; however, records of permitted work within Special Flood Hazard Areas are maintained through the City's building permit management system.
Do you maintain a list of property owners interested in flood mitigation?	The City does not maintain a list of property owners interested in flood mitigation at this time.
How many homeowners and/or business owners are interested in mitigation (elevation or acquisition)?	The City does not maintain a list of property owners interested in flood mitigation at this time.
Are any RiskMAP projects currently underway in your jurisdiction? If so, state what projects are underway.	There are no active RiskMAP projects within Laguna Woods.
How do you make Substantial Damage determinations?	The City determines that substantial damage has occurred based on the definition in the Laguna Woods Municipal Code. If the cost to repair damage, regardless of the cause, equals or exceeds 50% of the structure's pre-damage market value, the structure is considered substantially damaged.

NFIP Topic	Comments
How many Substantial Damage determinations were declared for recent flood events in your jurisdiction?	No substantial damages have been declared for recent flood events in Laguana Woods.
How many properties have been mitigated (elevation or acquisition) in your jurisdiction? If there are mitigation properties, how were the projects funded?	There have been no recently permitted mitigation activities in Laguna Woods.
Do your flood hazard maps adequately address the flood risk within your jurisdiction? If not, state why.	Yes.
NFIP Compliance	
What local department is responsible for floodplain management?	Planning & Environmental Services Department
Are any certified floodplain managers on staff in your jurisdiction?	There are no certified floodplain managers on staff.
Do you have access to resources to determine possible future flooding conditions from climate change?	The City relies on several key resources to assess potential flooding conditions in Laguna Woods, including FEMA flood maps, the City's Local Hazard Mitigation Plan, the California MyHazards tool, and the state's Cal-Adapt platform.
Does your floodplain management staff need any assistance or training to support its floodplain management program? If so, what type of assistance/training is needed?	The City does not require any flood-related assistance/training at this time.
Provide an explanation of NFIP administration services you provide (e.g., permit review, GIS, education/outreach, inspections, engineering capability)	Responsibilities within the City's floodplain management program are shared across multiple departments. The City's Floodplain Administrator ensures plan reviews include screening methods for floodplain management requirements. Building and Engineering staff are responsible for ensuring projects subject to floodplain regulations incorporate the necessary mitigation measures.
How do you determine if proposed development on an existing structure would qualify as a substantial improvement?	The City determines that proposed development on an existing structure is considered a substantial improvement based on the definition in the Laguna Woods Municipal Code. Substantial improvement is defined as any reconstruction, rehabilitation, addition, or other proposed development involving a structure, where the cost equals or exceeds 50 percent of the structure's market value before construction begins. This includes structures that have sustained substantial damage, regardless of the extent of actual repair work performed. However, it does not include 1) projects that correct existing violations of state or local health, safety, or sanitation codes that have been identified by a code enforcement official, provided the improvements are the minimum necessary to ensure safe living conditions; or 2) alterations to historic structures, as long as the changes do not compromise the structure's continued designation as a historic property.
What are the barriers to running an effective NFIP program in the community, if any?	The City has not encountered any barriers to implementing an effecting NFIP program in Laguna Woods.
Does your jurisdiction have any outstanding NFIP compliance violations that need to be addressed? If so, state the violations.	The City does not have any outstanding NFIP compliance violations.
When was the most recent Community Assistance Visit (CAV) or Community Assistance Contact (CAC)?	The last CAV to Laguna Woods occurred on September 7, 2010.

NFIP Topic	Comments
What is the local law number or municipal code of your flood damage prevention ordinance?	Code of Ordinances, Title 10 Buildings and Construction, Chapter 10.04 – Floodplain Management. Chapter 10.04
What is the date that your flood damage prevention ordinance was last amended?	Last amended on January 20, 2010.
Does your floodplain management program meet or exceed minimum requirements? If exceeds, in what ways?	The City's floodplain management program meets NFIP requirements.
Are there other local ordinances, plans or programs (e.g., site plan review) that support floodplain management and meeting the NFIP requirements? For instance, does the planning board or zoning board consider efforts to reduce flood risk when reviewing variances such as height restrictions?	The City primarily follows its Floodplain Management regulations outlined in its Municipal Code. When a project is located within a Special Flood Hazard Area, the City verifies that all applicable requirements are incorporated into the project.
Does your community plan to join the CRS program or is your community interested in improving your CRS classification?	The City is considering joining the CRS program as part of its future floodplain management efforts.

3.5 GROWTH/DEVELOPMENT TRENDS

Understanding how past, current, and projected development patterns have or are likely to increase or decrease risk in hazard areas is a key component to appreciating a jurisdiction's overall risk to its hazards of concern. Recent and expected future development trends, including major residential/commercial development and major infrastructure development, are summarized in Table 3-11 through Table 3-13.

Table 3-11. Number of Building Permits for New Construction Issued Since 2020

	New Construction Permits Issued			
	Single Family	Multi-Family	Other (commercial, mixed-use, etc.)	Total
2020				
Total Permits	No new construction occurred in the City's SFHAs during this period.			
Permits within SFHA				
2021				
Total Permits	No new construction occurred in the City's SFHAs during this period.			
Permits within SFHA				
2022				
Total Permits	No new construction occurred in the City's SFHAs during this period.			
Permits within SFHA				
2023				
Total Permits	No new construction occurred in the City's SFHAs during this period.			
Permits within SFHA				
2024				
Total Permits	No new construction occurred in the City's SFHAs during this period.			
Permits within SFHA				

SFHA = Special Flood Hazard Area (1% flood event)

Table 3-12. Recent Major Development and Infrastructure from 2020 to Present

Property or Development Name	Type of Development	# of Units / Structures	Location (address and/or block and lot)	Known Hazard Zones*	Description / Status of Development
Starbucks Drive-through	Commercial	1	23562 Moulton Parkway, Laguna Woods, CA 92637 616-021-29	The project site is partially located within a liquefication hazard zone.	The project allowed for (1) the establishment of a fast/fast casual food establishment, including physical modifications of an existing 2,626 square foot building and existing drive-through, queuing lane, parking, and landscape areas, and (2) construction of accessory facilities and structures. A certificate of occupancy was issued in October 2023.

* Only location-specific hazard zones or vulnerabilities identified.

Table 3-13. Known or Anticipated Major Development and Infrastructure in the Next Five Years

Property or Development Name	Type of Development	# of Units / Structures	Location (address and/or block and lot)	Known Hazard Zones*	Description / Status of Development
No known or anticipated major development.					

3.6 JURISDICTIONAL RISK ASSESSMENT

The hazard profiles in Volume I provide detailed information regarding each planning partner's vulnerability to the identified hazards, including summaries of the City of Laguna Woods' risk assessment results and data used to determine the hazard ranking. Key local risk assessment information is presented below.

3.6.1 Hazard Area

Maps of hazard areas in the City are shown in Figure 3-1 and Figure 3-2. These maps are based on the best available data at the time of the preparation of this plan and are adequate for planning purposes. Maps are provided only for hazards that can be identified clearly using mapping techniques and technologies and for which Orange County has significant exposure. The maps show the location of potential new development, where available.

Figure 3-1. City of Laguna Woods Dam Inundation and FEMA Flood Hazard Area Extent and Location Map

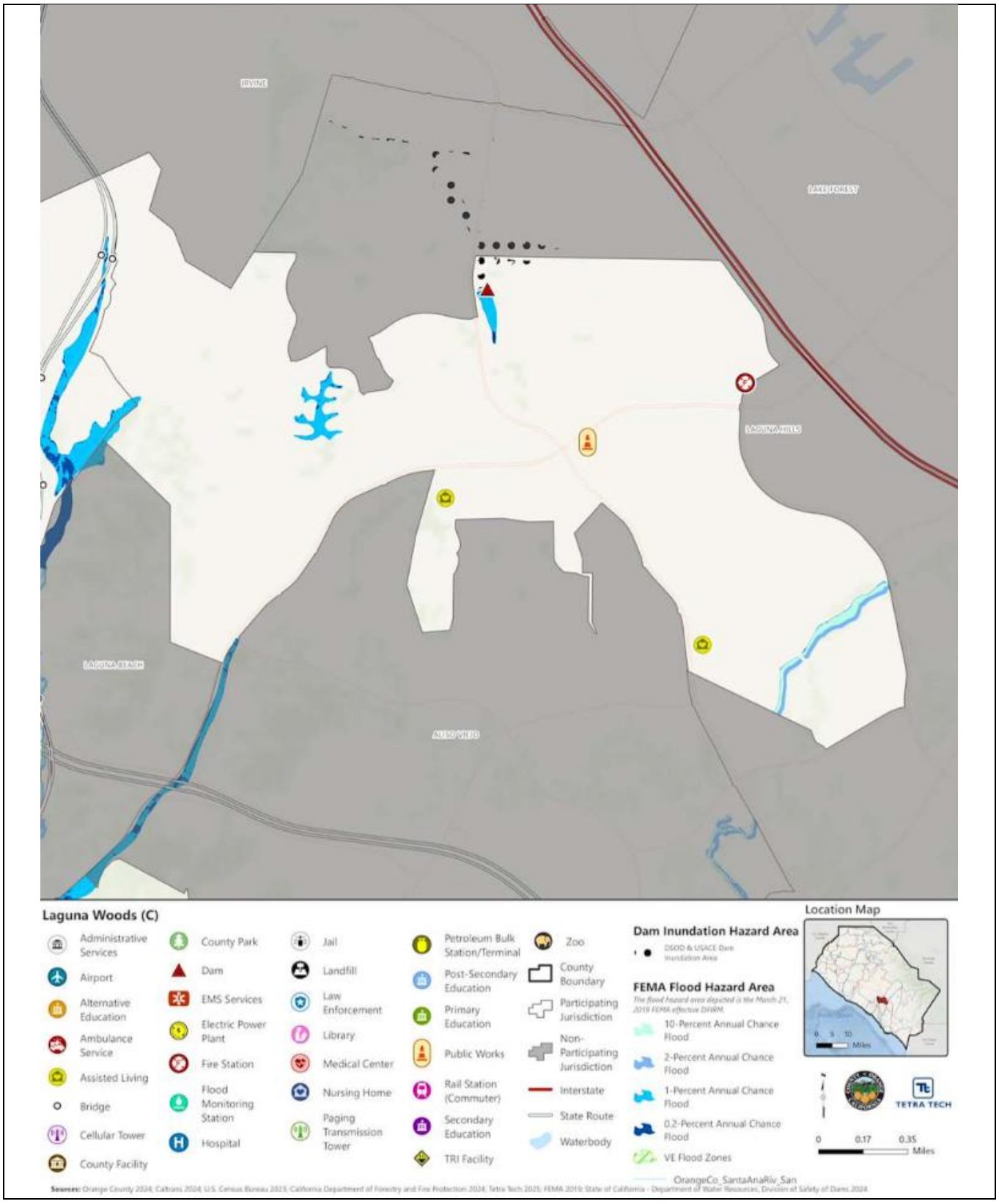
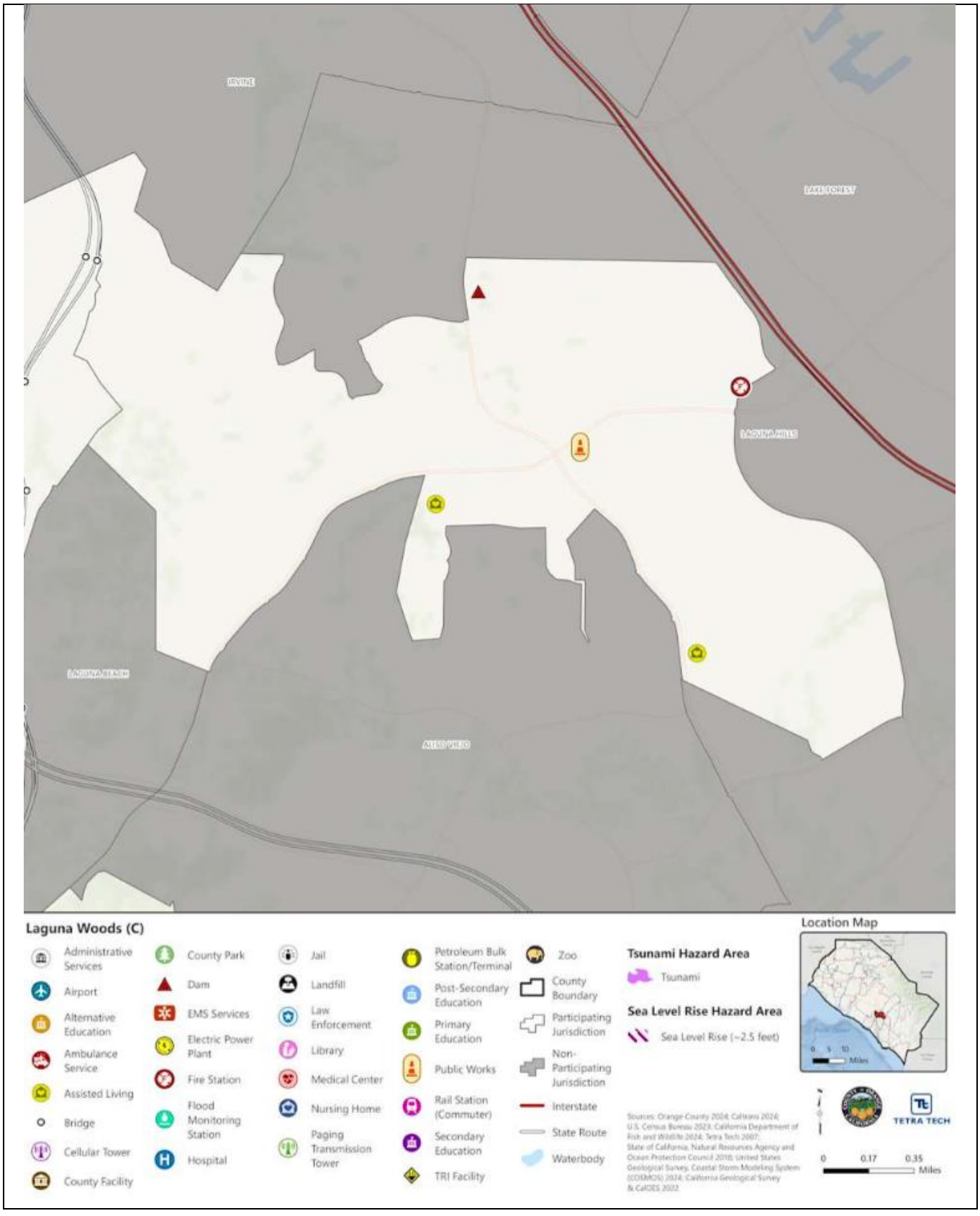


Figure 3-2. City of Laguna Woods Tsunami and Sea Level Rise Hazard Area Extent and Location Map



3.6.2 Hazard Event History

The history of natural and non-natural hazard events in Orange County is detailed in Volume I, where each hazard profile includes a chronology of historical events that have affected the County and its municipalities. Table 3-14 provides details on loss and damage in the City of Laguna Woods during hazard events since 2020.

Table 3-14. Hazard Event History in City of Laguna Woods

Dates of Event	Event Type (Disaster Declaration)	Summary of Event	Summary of Damage and Losses in Laguna Woods
September 16, 2015	-	An 8.3 magnitude earthquake off Chile's coast on the 16th prompted a tsunami advisory from Orange County to north of San Luis Obispo. Beaches, harbors, piers, and marinas in several cities, including Seal Beach and Huntington Beach, were closed through the 17th. Tsunami waves under one foot were observed along the Orange County coast. The Orange County EOC reported no significant flooding but warned of strong currents and dangerous waves.	No record of damages or losses in Laguna Woods.
January 18, 2017 – January 23, 2017	DR-4305-CA	Severe winter storm, mudslides, and flooding occurred throughout the region. Water damage and disruptions were seen in the County.	No record of damages or losses in Laguna Woods.
January 22, 2017	-	Heavy rain caused flash flooding across Orange County, resulting in $100,000 in property damages. A water rescue took place on Hamilton Ave. at the Santa Ana River in Huntington Beach. Streets from Sunset Beach to Santa Ana to Newport Beach were flooded with 1-3 feet of water. Many vehicles were stranded in floodwaters, including several along Highway 55.	No record of damages or losses in Laguna Woods.
February 17, 2017	-	Flood waters from the East Garden Grove-Wintersburg Channel overflowed, causing $50,000 in property damages and flooding a mobile home park.	No record of damages or losses in Laguna Woods.
May 24, 2017	-	High tides of 6.5 feet caused minor street flooding and $10,000 in property damages on Balboa Island, with some water entering houses near 36th and Finley Streets. The flooding was exacerbated by the recent demolition of a protective sea wall.	No record of damages or losses in Laguna Woods.
October 7, 2017	-	Lifeguards reported 6-8 ft surf on the 7th and 8th in Newport and Huntington Beach, with peak waves of 15 ft at the Wedge. Coastal flooding during high tide on the Balboa Peninsula in Newport Beach caused $25,000 in property damages. The beach parking lot, nearby streets, and homes were flooded, and several cars were swamped. In Capistrano Beach, large waves shattered a window in a home.	No record of damages or losses in Laguna Woods.
February 13, 2019	-	Flash flooding occurred in Laguna Beach with up to 2 inches of rain in 3 hours inundated storm channels, causing $80,000 in property damages. Streets were closed, and homes were threatened by the rising waters.	No record of damages or losses in Laguna Woods.
April 6, 2020	-	Heavy rainfall occurred in San Juan Capistrano which resulted in one inch of rain in just 20 minutes. In Silverado Canyon, 0.88 of rain was reported in 1 hour from two rain gauges.	No record of damages or losses in Laguna Woods.

Dates of Event	Event Type (Disaster Declaration)	Summary of Event	Summary of Damage and Losses in Laguna Woods
July 3, 2020	-	High tide near 6.8 feet and high surf caused minor coastal flooding in Newport Beach, resulting in $40,000 in property damages. Flooding extended up to three blocks inland, and a sailboat was washed ashore and destroyed.	No record of damages or losses in Laguna Woods.
March 10, 2021	-	Mud and debris flows from the Bond Fire caused $75,000 in property damages, damaging 8 vehicles and 6 homes. Swift water rescues were performed around 6 to 7 am. Mud covered at least 3 locations on Silverado Canyon Road and at Silverado Cafe, with rainfall rates reaching 0.20 inches in 15 minutes.	No record of damages or losses in Laguna Woods.
December 14, 2021	-	Debris flows from the Bond Fire scar and Silverado Canyon caused $800,000 in property damages. Santiago Creek Road was blocked by high water and mud, while Jackson Creek Road was flooded with mud and debris. Rainfall rates reached up to 1.2 inches at Irvine Lake and Santiago Canyon.	No record of damages or losses in Laguna Woods.
January 15, 2022	-	A Tsunami Advisory was issued at 5:03 AM for the Orange County Coast. Wireless Emergency Alerts and sirens were activated. The first wave arrived around 8 AM, causing coastal damage, including a drifting buoy off Huntington Bay.	No record of damages or losses in Laguna Woods.

EM = Emergency Declaration (FEMA); FEMA = Federal Emergency Management Agency; DR = Major Disaster Declaration (FEMA); N/A = Not applicable
Source: NWS, 2024; FEMA, 2024

3.6.3 Hazard Ranking and Vulnerabilities

The hazard profiles in Volume I have detailed information regarding each planning partner's vulnerability to the identified hazards. The following presents key risk assessment results for the City of Laguna Woods.

Hazard Ranking

The participating jurisdictions have differing degrees of vulnerability to the hazards of concern, so each jurisdiction ranked its own degree of risk to each hazard. The community-specific hazard ranking is based on problems and impacts identified by the risk assessment presented in Volume I. The ranking process involves an assessment of the likelihood of occurrence for each hazard; the potential impacts of the hazard on people, property, and the economy; community capabilities to address the hazard; and changing future climate conditions.

Table 3-15 shows the City's final hazard rankings for identified hazards of concern. Mitigation action development uses the ranking to target hazards with the highest risk. Hazards with a risk ranking of "low," such as Flood, Sea Level Rise, Coastal Flood, and Tsunami, may not present the most risk but remain a concern and mitigation action priority for the County and City of Laguna Woods. Stakeholder feedback indicates although Flood risk ranking is low, Orange County communities are still focused on addressing mitigation projects related to the hazard. In addition, hazards ranked as "high" does not necessarily indicate a surety of the hazard occurring or a prevalence of high-hazard dams, rather this ranking suggests that if a dam failure were to occur the potential impacts on the people, property, and economy would be very significant. The risk associated with "high" ranking are categorized as low-probability and high-consequence events.

Table 3-15. Hazard Ranking

Hazard	Rank
Flood	Low
Riverine Flood	Medium
Coastal Flood	Low
Sea Level Rise	Low
Tsunami	Low
Dam Failure	Low

Note: The scale is based on the hazard rankings established in Volume I, modified as appropriate based on review by the jurisdiction

Critical Facilities

Table 3-16 identifies those critical facilities in the community that are located in the 1 percent and 0.2 percent annual chance event floodplains – i.e., Special Flood Hazard Areas (SFHA).

Table 3-16. Critical Facility Exposure to the Special Flood Hazard Area (SFHA)

Name	Type	SFHA Exposure	
		1% Annual Chance Event	0.2% Annual Chance Event
City Hall - City of Laguna Woods	Administrative Services	N	N
IVY PARK AT LAGUNA WOODS	Assisted Living	N	N
IVY PARK OF WELLINGTON	Assisted Living	N	N
Orange County Fire Authority - Station 22	Fire Station	N	N
Laguna Woods Library	Library	N	N
Public Works City of Laguna Woods (in City Hall)	Public Works	N	N

Source: California Department of Education 2024; Caltrans 2024; HIFLD 2022, 2023, 2024; Orange County 2022, Orange County Sheriff's Department 2024; U.S. Geological Survey 2024; USACE 2024
Note: N = Facility is NOT exposed to the SFHA Zone (1% / 0.2%); Y = Facility IS exposed to the SFHA Zone (1% / 0.2%).

Dam Hazard Vulnerability

The U.S. Army Corps of Engineers (USACE) operates and maintains approximately 740 dams across the United States, providing benefits such as flood risk management, water supply, hydropower, and environmental stewardship (USACE 2021). USACE classifies its dams into five Dam Safety Action Classes (DSAC), ranging from DSAC I (highest risk) to DSAC V (lowest risk), based on factors like event probability, probability of failure, and potential consequences (USACE 2010). This risk-informed approach ensures that dam safety decisions prioritize life safety and effective resource allocation (USACE 2021).

The California Division of Safety of Dams (DSOD) oversees the design, construction, and maintenance of over 1,200 jurisdictional-sized dams in California (CA DWR 2025). Established in 1929, DSOD ensures dam safety by conducting annual inspections, reviewing structural and hydrological analyses, and approving modifications to existing dams. Dams are classified based on their downstream hazard potential, which ranges from high to low, reflecting the potential impact on life and property in the event of a failure (CA Office of Emergency Services GIS 2020). This classification system helps prioritize safety measures and resource allocation to protect communities and infrastructure. There are no people located in the City of Laguna Woods who reside in either the USACE Dams or California DSOD Dams inundation areas.

3.6.4 Identified Issues

After review of the City of Laguna Woods hazard event history, hazard rankings, hazard location, and current capabilities, the City identified the following vulnerabilities within the community:

- The intersection of El Toro Road and Avenida Sevilla/Laguna Woods Village Gate 1- The catch basin and storm drain along El Toro Road near Gate 1 are undersized and unable to effectively manage runoff during heavy rain events. Planned green street improvements in this area include upsizing the storm drain system and reconstructing the eastbound sidewalk to incorporate natural stormwater management features that slow, filter, and cleanse runoff from impervious surfaces. The project is designed to handle runoff from a 10-year storm event and mitigate flooding that impacts both vehicle travel lanes and the shared-use pedestrian, bicycle, and golf cart sidewalk.
- Because of its rarity and localized impact, dam failure can receive less public attention and fewer preparedness resources than more widely recognized hazards such as flooding.
- The City does not have a Post Disaster Response Action Plan.
- The City website lacks federal resources and site-specific flood risk reduction information for residents to access and utilize for future flood risks.
- The City General Plan Safety Element and Local Hazard Mitigation Plan are outdated and needs to be updated.
- The City does not have a dedicated public safety and hazard mitigation webpage for residents to access hazard information and resilience measures to protect themselves and properties.
- The City General Plan Conservation Element is outdated and needs to be updated.

Implemented and Continued Mitigation Efforts

The City has identified other mitigation efforts that are continuous efforts already implemented towards achieving flood resilience and emergency preparedness for residents. Those are outlined below:

- Continue to enforce zoning and development requirements that mitigate flood risks, including the preservation of open space zoning districts to absorb and filter stormwater and the incorporation of stormwater best management design standards into development projects.
- Continue to require review and approval of grading and drainage plans as part of the City's building permit process to ensure proper site drainage, erosion control, and compliance with stormwater management standards.
- Continue to require the implementation of Low Impact Development (LID) best management practices, such as permeable pavements, green roofs, bioswales, and rain gardens, for applicable development and redevelopment projects to manage stormwater runoff and improve water quality.
- Continue to ensure permitted projects within Special Flood Hazard Areas are compliant with the City's floodplain management regulations through the City's permitting system and plan review process.
- Continue regular inspection and maintenance of stormwater facilities.
- Maintain updated Special Flood Hazard Area and Dam Inundation Zone maps on the City's public interactive GIS map.
- Continue to promote drought-tolerant landscaping and water efficiency by enforcing MWELO requirements for new and rehabilitated landscapes.

- Continue to enforce Low Impact Development (LID) standards for applicable development projects by requiring site designs that minimize impervious surfaces and promote on-site stormwater retention and infiltration.
- Continue collaborating with NPDES MS4 Permit Permittees on regional stormwater capital improvement projects to manage sediment, improve water quality, and reduce flood risks across Orange County watersheds.
- Continue to participate in the County's AlertOC public alert system by maintaining up-to-date contact information, promoting resident enrollment on the City's website, and ensuring City communication channels are prepared to promptly issue emergency notifications.
- Continue to maintain coordination with public safety and emergency response partners OCFA and OCSD through ongoing communication, information sharing, and joint planning efforts.

3.7 MITIGATION STRATEGY AND PRIORITIZATION

City of Laguna Woods participated in the mitigation strategy workshop for this FMP to identify appropriate actions to include in a mitigation action catalogue. Its comprehensive consideration of all possible activities to address flood-related hazards of concern included review of the six CRS action categories:

- **Property Protection (PP)** -These actions include public activities to reduce hazard losses or actions that involve (1) modification of existing buildings or structures to protect them from a flood hazard or (2) removal of structures from the flood hazard area.
- **Preventative Measures (PR)** - Government, administrative, or regulatory actions, or processes that influence the way land and buildings are developed and built. Examples include planning and zoning, capital improvement plans, etc.
- **Public Information (PI)** - Actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them.
- **Natural Resource Protection (NPR)** - Actions that minimize flood hazard loss and preserve or restore the functions of natural systems.
- **Structural Flood Control Project (SP)** - Actions that involve the construction of structures to reduce the impact of a flood hazard. Such structures include dams, setback levees, floodwalls, retaining walls, and safe rooms.
- **Emergency Services (ES)** - Actions that protect people and property during and immediately following a disaster or flood related hazard event. Services include warning systems, emergency response services, and the protection of essential facilities.

The action worksheets included at the end of this annex list the mitigation actions that City of Laguna Woods would like to pursue in the future to reduce the effects of flood-related hazards. The actions are dependent upon available funding (grants and local match availability) and may be modified or omitted at any time based on the occurrence of new flood-related hazard events and changes in City priorities. Action summary information is provided in Table 3-17.

Volume I identifies 14 evaluation criteria for prioritizing the mitigation actions. To assist with rating each mitigation action as high, medium, or low priority, a numeric rank is assigned (-1, 0, or 1) for each of the evaluation criteria. Table 3-18 provides a summary of the prioritization of all proposed mitigation actions for the FMP.

Table 3-17. Mitigation Action Summary

Project Number	Project Name	Flood Hazard	Responsible Party	Brief Summary of the Problem and the Solution (Project)	CRS Category
2025-LagunaWoods-FMP1	El Toro Road Green Street and Flood Relief Project	Flood, Riverine Flood	City Engineering	The intersection of El Toro Road and Avenida Sevilla/Laguna Woods Village Gate 1- The catch basin and storm drain along El Toro Road near Gate 1 are undersized and unable to effectively manage runoff during heavy rain events. To mitigate localized flooding at the intersection of El Toro Road and Avenida Sevilla near Laguna Woods Village Gate 1, the City has added the El Toro Road Green Street and Flood Relief Project to its long-term Capital Improvement Program. Planned green street improvements in this area include upsizing the storm drain system and reconstructing the eastbound sidewalk to incorporate natural stormwater management features that slow, filter, and cleanse runoff from impervious surfaces. The project is designed to handle runoff from a 10-year storm event and mitigate flooding that impacts both vehicle travel lanes and the shared-use pedestrian, bicycle, and golf cart sidewalk.	SP
2025-LagunaWoods-FMP2	Dam Failure Public Outreach	Flood, Dam Failure	City Manager's Office	Because of its rarity and localized impact, dam failure can receive less public attention and fewer preparedness resources than more widely recognized hazards such as flooding. The City Manager's Office will work on developing public outreach information to residents on dam failure safety. This information will be available on the City website.	PI
2025-LagunaWoods-FMP3	Post Disaster Response Action Plan Development	All Flood Hazards	City Manager's Office	The City does not have a Post Disaster Response Action Plan. Should the City participate in the CRS Program, the City Manager's Office will explore funding availability to develop a Post Disaster Response Action Plan. If funding is secured the City will work to develop a Post Disaster Response Action Plan.	ES, PI
2025-LagunaWoods-FMP4	City Website Flood Risk Information	All Flood Hazards	City Manager's Office	The City website lacks federal resources and site-specific flood risk reduction information for residents to access and utilize for future flood risks. The City will provide FEMA floodproofing guidance on the City's website, including downloadable brochures on elevation and barriers, along with links to resources such as FloodSmart.gov and The Homeowner's Guide to Retrofitting for property owners seeking to protect their homes from flood damage. The City will also Offer site-specific flood risk reduction consultations with the City's Building Official and promote this service on the City's website.	PP

Project Number	Project Name	Flood Hazard	Responsible Party	Brief Summary of the Problem and the Solution (Project)	CRS Category
2025-LagunaWoods-FMP5	Updates to the General Plan Safety Element and Local Hazard Mitigation Plan	All Flood Hazards	Planning and Environmental Services Department	The City General Plan Safety Element and Local Hazard Mitigation Plan are outdated and needs to be updated. The City will Update the General Plan Safety Element and Local Hazard Mitigation Plan to strengthen policies and goals related to flood risk mitigation.	PR
2025-LagunaWoods-FMP6	Public Safety and Hazard Mitigation Webpage	All Flood Hazards	City Manager's Office	The City does not have a dedicated public safety and hazard mitigation webpage for residents to access hazard information and resilience measures to protect themselves and properties. The City will create and maintain a dedicated public safety and hazard mitigation webpage on the City's website to educate residents and support preparedness for low-, moderate-, and high-risk hazards. Resources may include: General guidance, brochures, and FEMA materials for property owners interested in floodproofing options Evacuation maps The City's Local Hazard Mitigation Plan Emergency preparedness and response guidance Links to external resources such as FloodSmart.gov Links to flood hazard maps	PI
2025-LagunaWoods-FMP7	City General Plan Conservation Element Update	All Flood Hazards	City Manager's Office	The City General Plan Conservation Element is outdated and needs to be updated. The City will work to update the City's General Plan Conservation Element to strengthen policies that protect natural resources, support sustainable land use, enhance climate resilience, and preserve environmental quality.	NRP

Table 3-18. Summary of Prioritization of Actions

Project Number	Project Name	Scores for Evaluation Criteria															High / Medium / Low
		Life Safety	Property Protection	Cost-Effectiveness	Political	Legal	Fiscal	Environmental	Social Vulnerability	Administrative	Hazards of Concern	Climate Change	Timeline	Community Lifelines	Other Local Objectives	Total	
2025-LagunaWoods-FMP1	El Toro Road Green Street and Flood Relief Project	1	1	0	1	1	1	0	1	0	1	1	1	1	1	11	High
2025-LagunaWoods-FMP2	Dam Failure Public Outreach	1	1	1	1	0	1	0	1	1	1	1	1	1	0	11	High
2025-LagunaWoods-FMP3	Develop a Post Disaster Response Action Plan	1	1	1	1	1	0	0	1	1	1	1	1	1	0	11	High
2025-LagunaWoods-FMP4	City Website Flood Risk Information	1	1	1	1	1	1	0	1	1	1	1	1	1	0	12	High
2025-LagunaWoods-FMP5	Updates to the General Plan Safety Element and Local Hazard Mitigation Plan	1	1	1	1	1	1	0	1	1	1	1	1	1	1	13	High
2025-LagunaWoods-FMP6	Public Safety and Hazard Mitigation Webpage	1	1	1	1	1	1	0	1	1	1	1	1	1	1	13	High
2025-LagunaWoods-FMP7	City General Plan Conservation Element Update	1	1	1	1	1	1	1	1	1	1	1	1	1	0	13	High

Note: Volume I, Section 6 (Mitigation Strategy) conveys guidance on prioritizing mitigation actions. Low (0-6), Medium (7-10), High (11-14).

Action 2025-LagunaWoods-FMP1. El Toro Road Green Street and Flood Relief Project

Lead Agency:	Engineering and Infrastructure Services Department
Supporting Agency	-
Hazard(s) of Concern:	Flood, Riverine Flood
Description of the Problem:	There is localized flooding at the intersection of El Toro Road and Avenida Sevilla near Laguna Woods Village Gate 1.
Description of the Solution:	The City has added the **El Toro Road Green Street and Flood Relief Project** to its long-term Capital Improvement Program. This project involves making "green street" improvements and upsizing the existing storm drain and catch basins on eastbound El Toro Road between Laguna Woods City Hall and the Valencia Center (approximately 0.5 linear miles). As part of this project, the eastbound sidewalk would be reconstructed to include natural stormwater management approaches that slow, filter, and cleanse stormwater runoff from impervious areas. This project is based on the findings of a hydrologic/hydraulic study that was commissioned by the City of Laguna Woods in 2019 to analyze recurring instances of localized flooding that affect both vehicle travel lanes and the joint-use pedestrian/ bicycle/golf cart sidewalk.
Estimated Cost:	High ($1,950,000)
Potential Funding Source:	Funding has not yet been identified; the City will continue to seek grant opportunities.
Implementation Timeline:	Long-term (> 5 years)
Benefits:	The work is intended to mitigate localized flooding resultant of a 10-year storm event. • *El Toro Road carries significant traffic* – El Toro Road is an arterial highway identified on the 2024 Orange County Master Plan of Arterial Highways ("MPAH") as "major" with a capacity of up to 45,000 average daily trips ("ADTs"). • *Climate Change* – State agencies and academic institutions (including the University of California) have long held that, despite drought conditions, precipitation and flood risk is likely to increase as a result of climate change. The 2021 California Climate Adaptation Strategy projects that Orange County will see "increased frequency and severity of rain events" and increased oscillation "between dry and wet weather extremes."
CRS Category	Structural Flood Control Project
Priority	High

Action 2025-LagunaWoods-FMP2. Dam Failure Public Outreach

Lead Agency:	City Manager's Office
Supporting Agency:	-
Hazard(s) of Concern:	Flood, Dam Failure
Description of the Problem:	Because of its rarity and localized impact, dam failure can receive less public attention and fewer preparedness resources than more widely recognized hazards such as flooding.
Description of the Solution:	The City Manager's Office will work on developing public outreach information to residents on dam failure safety. This information will be available on the City website.
Estimated Cost:	Low
Potential Funding Source:	Annual budget, staff time
Implementation Timeline:	Short-term (< 5 years)
Benefits:	High ($100,000)
CRS Category	Public Information
Priority	High

Action 2025-LagunaWoods-FMP3. Post Disaster Response Action Plan Development

Lead Agency:	City Manager's Office
Supporting Agency:	-
Hazard(s) of Concern:	All Flood Hazards
Description of the Problem:	The City does not have a Post Disaster Response Action Plan.
Description of the Solution:	Should the City participate in the CRS Program, the City Manager's Office will explore funding availability to develop a Post Disaster Response Action Plan. If funding is secured the City will work to develop a Post Disaster Response Action Plan.
Estimated Cost:	Medium
Potential Funding Source:	CDBG-DR, EDA Disaster Recovery Grants, HMA
Implementation Timeline:	Short-term (< 5 years)
Benefits:	High ($100,000)
CRS Category	Emergency Services, Public Information
Priority	High

Action 2025-LagunaWoods-FMP4. City Website Flood Risk Information

Lead Agency:	City Manager's Office
Supporting Agency:	-
Hazard(s) of Concern:	All Flood Hazards
Description of the Problem:	The City website lacks federal resources and site-specific flood risk reduction information for residents to access and utilize for future flood risks.
Description of the Solution:	The City will provide FEMA floodproofing guidance on the City's website, including downloadable brochures on elevation and barriers, along with links to resources such as FloodSmart.gov and The Homeowner's Guide to Retrofitting for property owners seeking to protect their homes from flood damage. The City will also Offer site-specific flood risk reduction consultations with the City's Building Official and promote this service on the City's website.
Estimated Cost:	Low
Potential Funding Source:	Annual budget, staff time
Implementation Timeline:	Short-term (< 5 years)
Benefits:	High ($100,000)
CRS Category	Property Protection
Priority	High

Action 2025-LagunaWoods-FMP5. Updates to the General Plan Safety Element and Local Hazard Mitigation Plan

Lead Agency:	Planning and Environmental Services Department
Supporting Agency:	-
Hazard(s) of Concern:	All Flood Hazards
Description of the Problem:	The City General Plan Safety Element and Local Hazard Mitigation Plan is outdated and needs to be updated.
Description of the Solution:	The City will Update the General Plan Safety Element and Local Hazard Mitigation Plan to strengthen policies and goals related to flood risk mitigation.
Estimated Cost:	Low
Potential Funding Source:	Annual budget, staff time
Implementation Timeline:	Short-term (< 5 years)
Benefits:	High ($100,000)
CRS Category	Preventative Measures
Priority	High

Action 2025-LagunaWoods-FMP6. Public Safety and Hazard Mitigation Webpage

Lead Agency:	City Manager's Office
Supporting Agency:	-
Hazard(s) of Concern:	All Flood Hazards
Description of the Problem:	The City does not have a dedicated public safety and hazard mitigation webpage for residents to access hazard information and resilience measures to protect themselves and properties.
Description of the Solution:	The City will create and maintain a dedicated public safety and hazard mitigation webpage on the City's website to educate residents and support preparedness for low-, moderate-, and high-risk hazards. Resources may include: • *General guidance, brochures, and FEMA materials for property owners interested in floodproofing options* • *Evacuation maps* • *The City's Local Hazard Mitigation Plan* • *Emergency preparedness and response guidance* • *Links to external resources such as FloodSmart.gov* • *Links to flood hazard maps*
Estimated Cost:	Low
Potential Funding Source:	Annual budget, staff time
Implementation Timeline:	Short-term (< 5 years)
Benefits:	High ($100,000)
CRS Category	Public Information
Priority	High

Action 2025-LagunaWoods-FMP7. City General Plan Conservation Element Update

Lead Agency:	City Manager's Office
Supporting Agency:	-
Hazard(s) of Concern:	All Flood Hazards
Description of the Problem:	The City General Plan Conservation Element is outdated and needs to be updated.
Description of the Solution:	The City will work to update the City's General Plan Conservation Element to strengthen policies that protect natural resources, support sustainable land use, enhance climate resilience, and preserve environmental quality.
Estimated Cost:	Low
Potential Funding Source:	Annual budget, staff time
Implementation Timeline:	Short-term (< 5 years)
Benefits:	High ($100,000)
CRS Category	Natural Resource Protection
Priority	High

4. CITY OF NEWPORT BEACH ANNEX

This jurisdictional annex to the Orange County Floodplain Management Plan (FMP) provides information to assist public and private sectors in the unincorporated areas with reducing losses from future hazard events. This annex is not guidance of what to do when a disaster occurs; its focus is on actions that can be implemented prior to a disaster to reduce or eliminate damage to property and people. The annex presents a general overview of the City of Newport Beach, describes who participated in the planning process, assesses these area's risk, vulnerability, and capabilities, and outlines a strategy for achieving a more resilient community.

4.1 FLOODPLAIN MANAGEMENT PLANNING TEAM

The City of Newport Beach identified primary and alternate FMP points of contact and developed this plan over the course of several months, with input from many City departments. The Engineering Department and Building Department represented the community on the Orange County FMP Planning Partnership and supported the local planning process by securing input from persons with specific knowledge to enhance the plan. All departments were asked to contribute to the annex development through reviewing and contributing to the capability assessment, reporting on the status of previously identified actions, and participating in action identification and prioritization.

Table 4-1 summarizes City officials who participated in the development of the annex and in what capacity. Additional documentation of the City's planning activities through Planning Partnership meetings is included in Volume I.

Table 4-1. Floodplain Management Planning Team

Primary Point of Contact	Alternate Point of Contact
Name/Title: Melissa Kubischta, SE, Principle Engineer Address: 100 Civic Center Drive, Newport Beach, CA 92660 Phone Number: 949-644-3309 Email: mkubischta@newportbeachca.gov	Name/Title: Tonee Thai, Chief Building Official Address: 100 Civic Center Drive, Newport Beach, CA 92660 Phone Number: 949-644-3309 Email: Tthai@newportbeachca.gov
National Flood Insurance Program Floodplain Administrator	
Name/Title: Grace K. Leung / City Manager Address: 100 Civic Center Drive, Newport Beach, CA 92660 Phone Number: 949-644-3001 Email: gleung@newportbeachca.gov	
Additional Contributors	
Name/Title: N/A Method of Participation: N/A	

4.2 COMMUNITY PROFILE

4.2.1 Brief History

The City of Newport Beach was officially incorporated on September 1, 1906, and its current City Charter was adopted in 1954 (City of Newport Beach 2025). Renowned for its upscale residential neighborhoods, modern shopping centers, robust businesses, and excellent school system, Newport Beach is a highly desirable place to live and work. The city encircles Newport Bay, where approximately 4,300 boats of various types are moored

within the expansive 21-square-mile harbor area (City of Newport Beach 2025). This picturesque bay, along with the city's eight miles of pristine ocean beaches, provides ample opportunities for outstanding fishing, swimming, surfing, and a wide range of aquatic sports activities. Newport Beach's unique blend of natural beauty and urban amenities makes it a vibrant and attractive coastal community (City of Newport Beach 2025).

4.2.2 Location

Nestled in the coastal heart of Orange County, Newport Beach is flanked by Los Angeles County to the north and San Diego County to the south. As of late 2010, the city boasts an estimated permanent population of 86,738 (City of Newport Beach 2025). However, during the summer, the population swells to over 100,000, with daily tourist numbers ranging from 20,000 to 100,000 (City of Newport Beach 2025).

4.2.3 Governing Body Format

The City functions under a Council-Manager system of governance. Seven City Council Members, elected by district but voted on by the entire population, serve four-year terms. The Council, comprising the Mayor and six other members, is tasked with policy-making, passing local laws, adopting the budget, appointing committees, and hiring the City Manager, City Attorney, and City Clerk. The City Manager is responsible for implementing the Council's policies and ordinances, managing the City's daily operations, and appointing department heads (City of Newport Beach 2025).

4.2.4 Population and Social Vulnerability

According to the U.S. Census, the 2020 population for the City of Newport Beach was 85,239. This is 9.2-percent of the total population of participating jurisdictions.

Research has shown that some populations are at greater risk from hazard events because of decreased resources or physical abilities. These populations can be more susceptible to hazard events based on a number of factors including their physical and financial ability to react or respond during a hazard, and the location and construction quality of their housing. Data from the 2023 American Community Survey indicates that there are 2,986 people 5 years of age or younger, 19,711 people 65 years of age or older, 2,129 people who are non-English speaking, 6,134 people below the poverty threshold, and 6,962 who are considered disabled.

4.3 JURISDICTIONAL CAPABILITY ASSESSMENT AND INTEGRATION

The City of Newport Beach performed an inventory and analysis of existing capabilities, plans, programs, and policies that enhance its ability to implement mitigation strategies. Volume I describes the components included in the capability assessment and their significance for floodplain management planning. The jurisdictional assessment for this annex includes analyses of the following:

- Planning and regulatory capabilities
- Development and permitting capabilities
- Administrative and technical capabilities
- Fiscal capabilities
- Education and outreach capabilities

- Classification under various community mitigation programs
- Adaptive capacity to withstand hazard events

For a community to succeed in reducing long-term risk, floodplain management must be integrated into day-to-day local government operations. As part of the floodplain management analysis, planning and /policy documents were reviewed and each jurisdiction was surveyed to obtain a better understanding of their progress toward plan integration. Development of an updated mitigation strategy provided an opportunity for the City of Newport Beach to identify opportunities for integrating mitigation concepts into ongoing City procedures.

4.3.1 Planning and Regulatory Capability and Integration

Table 4-2 summarizes the planning and regulatory tools that are available to the City of Newport Beach.

Table 4-2. Planning and Regulatory Capability and Integration

	Jurisdiction has this?	Citation and Date (code chapter or name of plan, date of enactment or plan adoption)	Authority (local, county, state, federal)	Responsible Person, Department or Agency
CODES, ORDINANCES, & REGULATIONS				
Building Code Adopted state building codes	Yes	City of Newport Beach Municipal Code. Title 15 Buildings and Construction, Chapter 15.04 Building Code, 11/29/2022.	Local	Building Division of the Community Development Department
How does this reduce risk from flood-related hazards? Chapter 15.04 establishes minimum standards for construction, design, and maintenance of buildings to ensure safety, health, and general welfare of the public.				
Zoning/Land Use Code	Yes	City of Newport Beach Municipal Code. Title 20 Planning and Zoning, 9/28/2024.	Local	Planning Division of the Community Development Department
How does this reduce risk from flood-related hazards? Chapter 20 defines how land within certain areas can be used, specifying the types of buildings allowed, their purposes, and the standards for their development to ensure orderly growth and compatibility within the City.				
Subdivision Code	Yes	City of Newport Beach Municipal Code. Title 19 Subdivisions, 7/30/2022	Local	Planning Division of the Community Development Department
How does this reduce risk from flood-related hazards? §19.24.090 Drainage and Flood Protection. (a) Flood Protection. All subdivision proposal shall conform to the requirements of Chapter 15.50 (Floodplain Management) and shall be designed so that public facilities such as sewer, gas, electric and water systems located and constructed to minimize flood damage. (b) Flood Channels. If an existing or proposed flood channel, as shown on an officially adopted flood control plan, is located so that any portion of it lies within or adjacent to a subdivision, the channel shall be illustrated on the tentative map as a lettered lot in a width and in an alignment corresponding to the flood control plan. §19.24.100 Subdivision Boundaries. (a) No Exclusions to Avoid Dedication of Improvement. Regardless of its size, no portion of any property shown on the lates equalized County assessment roll as a unit or contiguous units shall be exclude form within the boundaries of a subdivision for the purpose of avoiding dedication or improvement of any street, drainage, or flood control facility. §19.28.080 Storm Drains. (e) Flood Protection. Subdivision design and improvements shall provide for protection against flooding and inundation in accordance with Chapter 15.50 (Floodplain Management)			

	Jurisdiction has this?	Citation and Date (code chapter or name of plan, date of enactment or plan adoption)	Authority (local, county, state, federal)	Responsible Person, Department or Agency
Site Plan Code	No	-	-	-
How does this reduce risk from flood-related hazards?				
Stormwater Management Code	Yes	City of Newport Beach Municipal Code. Title 14 Water and Sewers. Chapter 14.36 Water Quality, 12/2/2023	Local	Public Works Department
How does this reduce risk from flood-related hazards? Chapter 14.36 aims to improve water quality by controlling urban pollutants in storm water runoff, ensuring compliance with federal requirements and protecting local waterways.				
Post-Disaster Recovery/ Reconstruction Code	Yes	City of Newport Beach Municipal Code. Title 15 Buildings and Constructions, Chapter 15.12 Post-Disaster Safety Assessment Placards and Standard for Repair of Damaged Structures, 6/1/2013	Local	Emergency Management Division of the Police Department
How does this reduce risk from flood-related hazards? Chapter 15.12 establishes standards to indicate the safety condition of structures for continued occupancy after a disaster and outlines the standards for repairing damaged buildings				
Real Estate Disclosure Requirements	No	-	-	-
How does this reduce risk from flood-related hazards?				
Growth Management	No	-	-	-
How does this reduce risk from flood-related hazards?				
Environmental Protection Ordinance(s)	No	-	-	-
How does this reduce risk from flood-related hazards?				
Flood Damage Prevention Ordinance	Yes	City of Newport Beach Municipal Code. Title 15 Buildings and Constructions, Chapter 15.50 Floodplain Management, 12/2/2023	Local	Building Division of the Community Development Department
How does this reduce risk from flood-related hazards? Contains the City's floodplain management regulations.				
Wellhead Protection	No	-	-	-
How does this reduce risk from flood-related hazards?				
Emergency Management Ordinance	Yes	City of Newport Beach Municipal Code. Title 2 Administration and Personnel, Chapter 2.20 Emergency Services, 12/2/2023	Local	Emergency Management Division of the Police Department
How does this reduce risk from flood-related hazards? Chapter 2.20 provides for the preparation and implementation of emergency plans to protect persons and property. It also empowers City officials to issue necessary orders and coordinates emergency services with other agencies				

	Jurisdiction has this?	Citation and Date (code chapter or name of plan, date of enactment or plan adoption)	Authority (local, county, state, federal)	Responsible Person, Department or Agency
Climate Change Ordinance	No	-	-	-
How does this reduce risk from flood-related hazards?				
Other	Yes	City of Newport Beach Municipal Code. Title 21 Local Coastal Program Implementation Plan, Chapter 21.30 Property Development Standards, 12/14/2024	Local	Planning Division of the Community Development Department

How does this reduce risk from flood-related hazards?

§21.30.015 General Site Planning and Development. D: Waterfront Development. 3: Development Standards. (b) The minimum required top of slab elevation for interior livings areas of all new structures shall be as established by the Flood Insurance Rate Maps recognized by the Building Division as part of flood safety requirements and maps adopted by the Council (see Section 21.30.060 (B)(3)) or higher where recommended by the coastal hazards reported required by subsection (E)(2) of this section with acknowledgment of potential need for adaption measure in the future to address flood potential and sea level rise. Notwithstanding the building elevations established by the Flood Insurance Rate Maps, the minimum required top of slab elevation for interior living areas of all new structures shall be at least 9.00 (NAVD88)

§21.30.015 General Site Planning and Development. E: Development in Shoreline Hazardous Areas. 2: Coastal Hazard Report. Coastal development permit applications for development proposed in shoreline areas subject to current or expected future erosion, flooding/inundation, wave run up, or wave impacts, including those resulting from sea level rise, shall include a coastal hazards report. (E) Identification of necessary mitigation measures to address current hazardous conditions such as siting development away from hazardous areas and elevating the finished floor of structures to be at or above the base flood elevation including measures that may be required in the future to address increased erosion and flooding due to sea level rise such as waterproofing, flood shields, watertight door, moveable floodwalls, partitions, water-resistive sealant devices, sandbagging, and other similar flood-proofing techniques.

§21.30.060 Height Limits and Exceptions. (B) Height of Structures and Measurements.3: Flood Hazards Areas. (a) Top of Slab Elevation for Interior Living Areas. The minimum required top of slab elevation for interior living areas of all new development within flood hazard areas shall be established by the Flood Insurance Rate Maps recognized by the Building Division as part of flood safety requirements and maps adopted by the Council. Notwithstanding the building elevations established by the Flood Insurance Rate Maps, the minimum required top of slab elevations for interior living areas of all new development shall be at least 9.00 (NAVD 88).

	Jurisdiction has this?	Citation and Date (code chapter or name of plan, date of enactment or plan adoption)	Authority (local, county, state, federal)	Responsible Person, Department or Agency
PLANNING DOCUMENTS				
Comprehensive/ Master Plan	Yes	City of Newport Beach General Plan, 10/25/2022 (Chapter 7 Circulation Element)	Local	Planning Division of the Community Development Department

How does this reduce risk from flood-related hazards?
Chapter 4 Harbor and Bay Element. Goal HB 8: Enhancement and protection of water quality of all natural water bodies, including coastal waters, creeks, bays, harbors and wetlands. HB 8.9 Natural Drainage Systems: Require incorporation of natural drainage systems and stormwater detention facilities into new developments, where appropriate and feasible, to retain stormwater in order to increase groundwater recharge. Goal HB 13: Maintain and enhance deep water channels and ensure they remain navigable by boats. HB 13.6 Beach Width Monitoring: Monitor beach width and elevations and analyze monitoring data to establish approximate thresholds for when beach erosion or deflation will reach a point that could expose the backshore development to flooding or damage from storm waves. HB 13.7 Emergency Use of Coastal Facilities: Establish procedures and public/private cooperation and communication for the emergency use of coastal facilities and equipment in advance of flood, storm, pollution, dredging, vessel sinking, and other events, supplement other safety and rescue bases and equipment.

Chapter 11 Safety Element. Notes the flood hazards for the city including riverine, dam failure, tsunami and rogue wave, and coastal flooding. Tsunami and rogue wave Hazards Goal S1: Protection of people and property from the adverse effects of coastal hazards related tsunamis and rogue waves. Goal S1 policies include evacuation routes, evacuation response plans, beach replenishment, education program, and tsunami research.
Storm surge and seiche hazards Goal S2: Protection of people and property from the adverse effect of coastal hazard related to storm surge and seiches. Goal S2 policies include wave up-rush and impact reports, shoreline management plans, use of temporary shoreline protection, use of existing shoreline protection, shoreline protection alternative, maintenance of storm drains, residential design.
Protection from flooding risks Goal S5: Protection of human life and public and private property form the risks of flooding. Goal S5 policies include new development design within the 100-year floodplains, facility use or storage of hazardous materials standards, and minimization of flood hazard risk.

Capital Improvement Plan	Yes	City of Newport Beach Fiscal Year 2024-25 through 2029-30 Capital Improvement Program, 6/11/2024	Local	Public Works Department, specifically the Engineering and Construction Services Division

How does this reduce risk from flood-related hazards?
Two projects (Harbor and Ocean Bulkheads / Seawall/ Structure Repairs and Balboa Island Street and Drainage Improvements) is focusing on protecting infrastructure from future flooding or repairing infrastructure in areas of frequent flooding.

Disaster Debris Management Plan	No	-	-	-

How does this reduce risk from flood-related hazards?

Floodplain Management or Watershed Plan	No	-	-	-

How does this reduce risk from flood-related hazards?

	Jurisdiction has this?	Citation and Date (code chapter or name of plan, date of enactment or plan adoption)	Authority (local, county, state, federal)	Responsible Person, Department or Agency
Stormwater Management Plan	Yes	Guidelines For Preparing Water Quality Management Plan (WQMP) Report	Local	Building Division of the Community Development Department
How does this reduce risk from flood-related hazards? The purpose of Water Quality Management Plan (WQMP) is to reduce discharge of pollutants into urban runoff from development projects by reducing or eliminating sources of pollutants and managing site runoff volumes and flow rates through application of appropriate Best Management Practices (BMP's).				
Open Space Plan	No	-	-	-
How does this reduce risk from flood-related hazards?				
Urban Water Management Plan	Yes	2020 Urban Water Management Plan, 2021	Local	Utilities Department
How does this reduce risk from flood-related hazards? This Plan ensures long-term water supply by assessing water sources, implementing management measures for water demand, and planning for water shortages. It also includes the use of recycled water.				
Habitat Conservation Plan	No	-	-	-
How does this reduce risk from flood-related hazards? N/A				
Habitat Protection/ Restoration Plan	Yes	Western Snowy Plover Management Plan for East Balboa Peninsula Beaches, July 2022	NFP2	Community Development Department, Planning Division
How does this reduce risk from flood-related hazards? A Habitat Protection/Restoration Plan identifies critical habitat within the floodplain, actions to protect remaining habitat, and/or actions to restore fully functioning habitat. Frequently this will result in the preservation and/or restoration of riparian habitat that is necessary for water-dependent species.				
Green Infrastructure Plan	No	-	-	-
How does this reduce risk from flood-related hazards? N/A				
Comprehensive/Community Plan	No	-	-	-
How does this reduce risk from flood-related hazards? N/A				
Agriculture Plan	No	-	-	-
How does this reduce risk from flood-related hazards?				
Climate Action/ Resilience/Sustainability Plan	No	-	-	-
How does this reduce risk from flood-related hazards?				
Tourism Plan	No	-	-	-
How does this reduce risk from flood-related hazards?				

	Jurisdiction has this?	Citation and Date (code chapter or name of plan, date of enactment or plan adoption)	Authority (local, county, state, federal)	Responsible Person, Department or Agency
Business/ Downtown Development Plan	No	-	-	-
How does this reduce risk from flood-related hazards?				
Other	Yes	Upper Newport Bay Ecological Reserve	NFP1	California Department of Fish and Wildlife
How does this reduce risk from flood-related hazards? The Upper Newport Bay Ecological Reserve is a 752-acre coastal wetland in Newport Beach, known for its rich biodiversity, unique habitats, and importance as a sanctuary for shorebirds, waterfowl, and marine life.				
RESPONSE/RECOVERY PLANNING				
Emergency Operations Plan	Yes	City of Newport Beach Emergency Operations Plan, 11/29/2022	Local	City Manager's Office
How does this reduce risk from flood-related hazards? The EOP lists flooding (riverine, dam failure, storm surge) as risk to the community.				
Continuity of Operations Plan	No	-	-	-
How does this reduce risk from flood-related hazards?				
Substantial Damage Response Plan	No	-	-	-
How does this reduce risk from flood-related hazards?				
Threat and Hazard Identification and Risk Assessment	Yes	Local Hazard Mitigation Plan City of Newport Beach, California 2016 Update, 5/10/2016.	Local	Utilities Department
How does this reduce risk from flood-related hazards? Section 7 of the plan covers the flooding hazards for the city (riverine, dam failure, storm surge, sea level rise). Section 4 of the plan covers the goals and action items. Example action items for flooding include monitor the ocean sand to develop a history of its movement and develop trends along the City's coastal, require that all new development and re-development in area susceptible to flooding incorporate mitigation measure to reduce or eliminate the hazard of flooding, and maintain and regularly clean out, as needed, the storm drains in low lying areas.				
Post-Disaster Recovery Plan	No	-	-	-
How does this reduce risk from flood-related hazards?				
Other	No	-	-	-
How does this reduce risk from flood-related hazards?				

4.3.2 Development and Permitting Capability

Table 4-3 summarizes the capabilities of the City of Newport Beach to oversee and track development.

Table 4-3. Development and Permitting Capability

	Yes/No	Comment
Do you issue development permits? • **If you issue development permits, what department is responsible?** • **If you do not issue development permits, what is your process for tracking new development?**	Yes	Building Division of the Community Development Department in Newport Beach is responsible for issuing development permits.
Are permits tracked by hazard area? (For example, floodplain development permits.)	No	-
Do you have a buildable land inventory? • **If you have a buildable land inventory, please describe**	No	-
Describe the level of buildout in your jurisdiction.	-	The City is predominantly built out and there is limited space for new development.

4.3.3 Administrative and Technical Capability

Table 4-4 summarizes potential staff and personnel resources available to the City of Newport Beach and their current responsibilities that contribute to floodplain management.

Table 4-4. Administrative and Technical Capabilities

Resources	Available?	Comment
ADMINISTRATIVE CAPABILITY		
Planning Board	Yes	Planning Division of the Community Development Department
Zoning Board of Adjustment	Yes	Zoning Administrator and a Planning Commission that handle zoning matters.
Planning Department	Yes	Planning Division of the Community Development Department
Mitigation Planning Committee	No	-
Environmental Board/Commission	Yes	Energy and Environment Commission
Open Space Board/Committee	No	-
Economic Development Commission/Committee	No	-
Public Works/Highway Department	Yes	Public Works Department
Construction/Building/Code Enforcement Department	Yes	Code Enforcement Division within the Community Development Department
Emergency Management/Public Safety Department	Yes	Emergency Management Division within the Police Department
Maintenance programs to reduce risk (stormwater maintenance, tree trimming, etc.)	No	-
Mutual aid agreements	No	-
Human Resources Manual - Do any job descriptions specifically include identifying or implementing mitigation projects or other efforts to reduce natural hazard risk?	No	-
Other	No	-

Resources	Available?	Comment
TECHNICAL/STAFFING CAPABILITY		
Planners or engineers with knowledge of land development and land management practices	Yes	Planning Division of the Community Development Department
Engineers or professionals trained in building or infrastructure construction practices	Yes	Code Enforcement Division within the Community Development Department
Planners or engineers with an understanding of natural hazards	Yes	Emergency Management Division within the Police Department
Staff with expertise or training in benefit/cost analysis	No	-
Professionals trained in conducting damage assessments	Yes	Building Division of the Community Development Department
Personnel skilled or trained in GIS and/or Hazus applications	No	-
Staff that work with socially vulnerable populations or underserved communities	No	-
Public Information Officer	Yes	**Public Information Office**
Surveyors	No	-
Emergency manager	No	-
CRS Coordinator	No	-
Resilience Officer	No	-
Other (this could include stormwater engineer, environmental specialist, etc.)	No	-

4.3.4 Fiscal Capability

Table 4-5 summarizes financial resources available to the City of Newport Beach.

Table 4-5. Fiscal Capabilities

Financial Resources	Accessible or Eligible to Use?
Community Development Block Grants (CDBG, CDBG-DR)	Yes – Accessible
Capital improvement project funding	Yes – Accessible
Authority to levy taxes for specific purposes	Yes – Eligible
User fees for water, sewer, gas, or electric service	Yes – Eligible
Impact fees for homebuyers or developers of new development/homes	Yes – Eligible
Stormwater utility fee	Yes – Eligible
Incur debt through general obligation bonds	Yes – Eligible
Incur debt through special tax bonds	Yes – Eligible
Incur debt through private activity bonds	Yes – Eligible
Withhold public expenditures in hazard-prone areas	Yes – Eligible
Other federal or state funding programs	Yes – Eligible
Open Space Acquisition funding programs	Yes – Eligible
Other (for example, Clean Water Act 319 Grants [Nonpoint Source Pollution])	No

4.3.5 Education and Outreach Capability

Table 4-6 summarizes the education and outreach resources available to the City of Newport Beach.

Table 4-6. Education and Outreach Capabilities

Outreach Resources	Available?	Comment
Public information officer or communications office	Yes	Public Information Office
Personnel skilled or trained in website development	No	-
Floodplain management information available on your website	No	-
Social media for floodplain management education and outreach	No	-
Citizen boards or commissions that address issues related to floodplain management	No	-
Warning systems for hazard events	Yes	AlertOC
Natural disaster/safety programs in place for schools	No	-
Organizations that conduct outreach to socially vulnerable populations and underserved populations	No	-
Public outreach mechanisms / programs to inform citizens on natural hazards, risk, and ways to protect themselves during such events	No	-

4.3.6 Community Classifications

Table 4-7 summarizes classifications for community programs available to the City of Newport Beach.

Table 4-7. Community Classifications

Program	Participating?	Classification	Date Classified
Community Rating System (CRS)	Yes	6	10/1/1993
Building Code Effectiveness Grading Schedule (BCEGS)	No	-	-
Public Protection (ISO Fire Protection Classes 1 to 10)	Yes	Class 1	2023
National Weather Service StormReady Certification	Yes	Storm / Tsunami Ready	2016
Firewise Communities classification	No	-	-
Other: Organizations with mitigation focus (advocacy group, non-government)	No	-	-

— = Unavailable

4.3.7 Adaptive Capacity

Adaptive capacity is defined as “the ability of systems, institutions, humans and other organisms to adjust to potential damage, to take advantage of opportunities, or respond to consequences” (IPCC 2022). Each jurisdiction has a unique combination of capabilities to adjust to, protect from, and withstand a future hazard event, future conditions, and changing risk. Table 4-8 summarizes the adaptive capacity for each identified hazard of concern and the City’s capability to address related actions using the following classifications:

- Strong: Capacity exists and is in use.
- Moderate: Capacity might exist; but is not used or could use some improvement.
- Weak: Capacity does not exist or could use substantial improvement

Table 4-8. Adaptive Capacity

Hazard	Adaptive Capacity - Strong/Moderate/Weak
Flood	Moderate
Riverine Flood	Moderate
Coastal Flood	Weak
Sea Level Rise	Weak
Tsunami	Weak
Dam Failure	Weak

4.4 NATIONAL FLOOD INSURANCE PROGRAM COMPLIANCE

This section provides specific information on the management and regulation of the regulatory floodplain, including current and future compliance with the National Flood Insurance Program (NFIP). The floodplain administrator listed in Table 4-1 is responsible for maintaining this information.

4.4.1 NFIP Statistics

Table 4-9 summarizes the NFIP policy and claim statistics for the City of Newport Beach.

Table 4-9. City of Newport Beach NFIP Summary of Policy and Claim Statistics

# Claims (Losses)	33
Total Loss Payments	$742,205.70
# Repetitive Loss Properties (NFIP definition)	8
# Repetitive Loss Properties (FMA definition)	**0**
# Severe Repetitive Loss Properties (NFIP definition)	**0**
# Severe Repetitive Loss Properties (FMA definition)	**0**

NFIP Definition of Repetitive Loss: The NFIP defines a repetitive loss property as any insurable building for which two or more claims of more than $1,000 were paid by the NFIP within any rolling 10-year period since 1978.

FMA Definition of Repetitive Loss: FEMA's Flood Mitigation Assistance (FMA) program defines a repetitive loss property as any insurable building that has incurred flood-related damage on two occasions, in which the cost of the repair, on average, equaled or exceeded 25 percent of the market value of the structure at the time of each such flood event.

Definition of Severe Repetitive Loss: A residential property covered under an NFIP flood insurance policy and: (a) That has at least four NFIP claim payments over $5,000 each, and the cumulative amount of such claims payments exceeds $20,000; or (b) For which at least two separate claims payments have been made with the cumulative amount of the building portion of such claims exceeding the market value of the building. At least two of the claims must have occurred within any 10-year period, more than 10 days apart.

Source: FEMA, 2024.

1.4.2 Flood Vulnerability Summary

Table 4-10 provides a summary of the NFIP program in the City of Newport Beach.

Table 4-10. NFIP Summary

NFIP Topic	Comments
Flood Vulnerability Summary	
Describe areas prone to flooding in your jurisdiction.	Low lying areas of the City are prone to flooding.
Do you maintain a list of properties that have been damaged by flooding?	The City reviews the repetitive loss properties list every year.
Do you maintain a list of property owners interested in flood mitigation?	No, not at this time.
How many homeowners and/or business owners are interested in mitigation (elevation or acquisition)?	None, not at this time.
Are any RiskMAP projects currently underway in your jurisdiction? If so, state what projects are underway.	No, not at this time.
How do you make Substantial Damage determinations?	The City has a City Policy NBMC 15.50 and use a form that they have the applicant place on the plans.
How many Substantial Damage determinations were declared for recent flood events in your jurisdiction?	No recent substantial damage events from flood. One from fire.
How many properties have been mitigated (elevation or acquisition) in your jurisdiction? If there are mitigation properties, how were the projects funded?	No properties have been mitigated beyond substantial improvement in the City.
Do your flood hazard maps adequately address the flood risk within your jurisdiction? If not, state why.	Yes, the flood maps adequately address the flood risk within the City.
NFIP Compliance	
What local department is responsible for floodplain management?	Community Development Department
Are any certified floodplain managers on staff in your jurisdiction?	No, not at this time.
Do you have access to resources to determine possible future flooding conditions from climate change?	The City local coastal program requires consideration of sea level rise. The City sea level rise values are based on state guidelines.
Does your floodplain management staff need any assistance or training to support its floodplain management program? If so, what type of assistance/training is needed?	Seminars or other training related to obtaining floodplain management certification.
Provide an explanation of NFIP administration services you provide (e.g., permit review, GIS, education/outreach, inspections, engineering capability)	Permit review, maintenance of elevation certificates, GIS for current and historic floodplain maps, outreach and outreach.
How do you determine if proposed development on an existing structure would qualify as a substantial improvement?	The City has a City Policy NBMC 15.50 and use a form that they have the applicant place on the plans.
What are the barriers to running an effective NFIP program in the community, if any?	Outreach to local residents, especially in the special flood hazard zones, is not prioritized.
Does your jurisdiction have any outstanding NFIP compliance violations that need to be addressed? If so, state the violations.	No, not at this time.
When was the most recent Community Assistance Visit (CAV) or Community Assistance Contact (CAC)?	Last CAV from the state was on March 11, 2021
What is the local law number or municipal code of your flood damage prevention ordinance?	Newport Beach Municipal Code, Title 15 – Buildings and Construction, Chapter 15.50
What is the date that your flood damage prevention ordinance was last amended?	Last updated 2023

NFIP Topic	Comments
Does your floodplain management program meet or exceed minimum requirements? If exceeds, in what ways?	CRS Class 6 community.
Are there other local ordinances, plans or programs (e.g., site plan review) that support floodplain management and meeting the NFIP requirements? For instance, does the planning board or zoning board consider efforts to reduce flood risk when reviewing variances such as height restrictions?	The local coastal program, zoning code in VE flood zones.
Does your community plan to join the CRS program or is your community interested in improving your CRS classification?	Currently CRS Class 6 community

4.5 GROWTH/DEVELOPMENT TRENDS

Understanding how past, current, and projected development patterns have or are likely to increase or decrease risk in hazard areas is a key component to appreciating a jurisdiction's overall risk to its hazards of concern. Recent and expected future development trends, including major residential/commercial development and major infrastructure development, are summarized in Table 4-11 through Table 4-13.

Table 4-11. Number of Building Permits for New Construction Issued Since 2020

	New Construction Permits Issued			
	Single Family	Multi-Family	Other (commercial, mixed-use, etc.)	Total
2020				
Total Permits	0	0	0	0
Permits within SFHA	0	0	0	0
2021				
Total Permits	0	0	1	1
Permits within SFHA	0	0	1	1
2022				
Total Permits	0	2	0	2
Permits within SFHA	0	2	0	2
2023				
Total Permits	0	0	1	1
Permits within SFHA	0	0	1	1
2024				
Total Permits	0	1	0	1
Permits within SFHA	0	1	0	1

SFHA = Special Flood Hazard Area (1% flood event)

Table 4-12. Recent Major Development and Infrastructure from 2020 to Present

Property or Development Name	Type of Development	# of Units / Structures	Location (address and/or block and lot)	Known Hazard Zones*	Description / Status of Development
No recent major development.					

* Only location-specific hazard zones or vulnerabilities identified.

Table 4-13. Known or Anticipated Major Development and Infrastructure in the Next Five Years

Property or Development Name	Type of Development	# of Units / Structures	Location (address and/or block and lot)	Known Hazard Zones*	Description / Status of Development
No knowns or anticipated major development.					

4.6 JURISDICTIONAL RISK ASSESSMENT

The hazard profiles in Volume I provide detailed information regarding each planning partner's vulnerability to the identified hazards, including summaries of the City of Newport Beach's risk assessment results and data used to determine the hazard ranking. Key local risk assessment information is presented below.

4.6.1 Hazard Area

Maps of hazard areas in the City are shown in Figure 4-1 and Figure 4-2. These maps are based on the best available data at the time of the preparation of this plan and are adequate for planning purposes. Maps are provided only for hazards that can be identified clearly using mapping techniques and technologies and for which Orange County has significant exposure. The maps show the location of potential new development, where available.

Figure 4-1. City of Newport Beach Dam Inundation and FEMA Flood Hazard Area Extent and Location Map

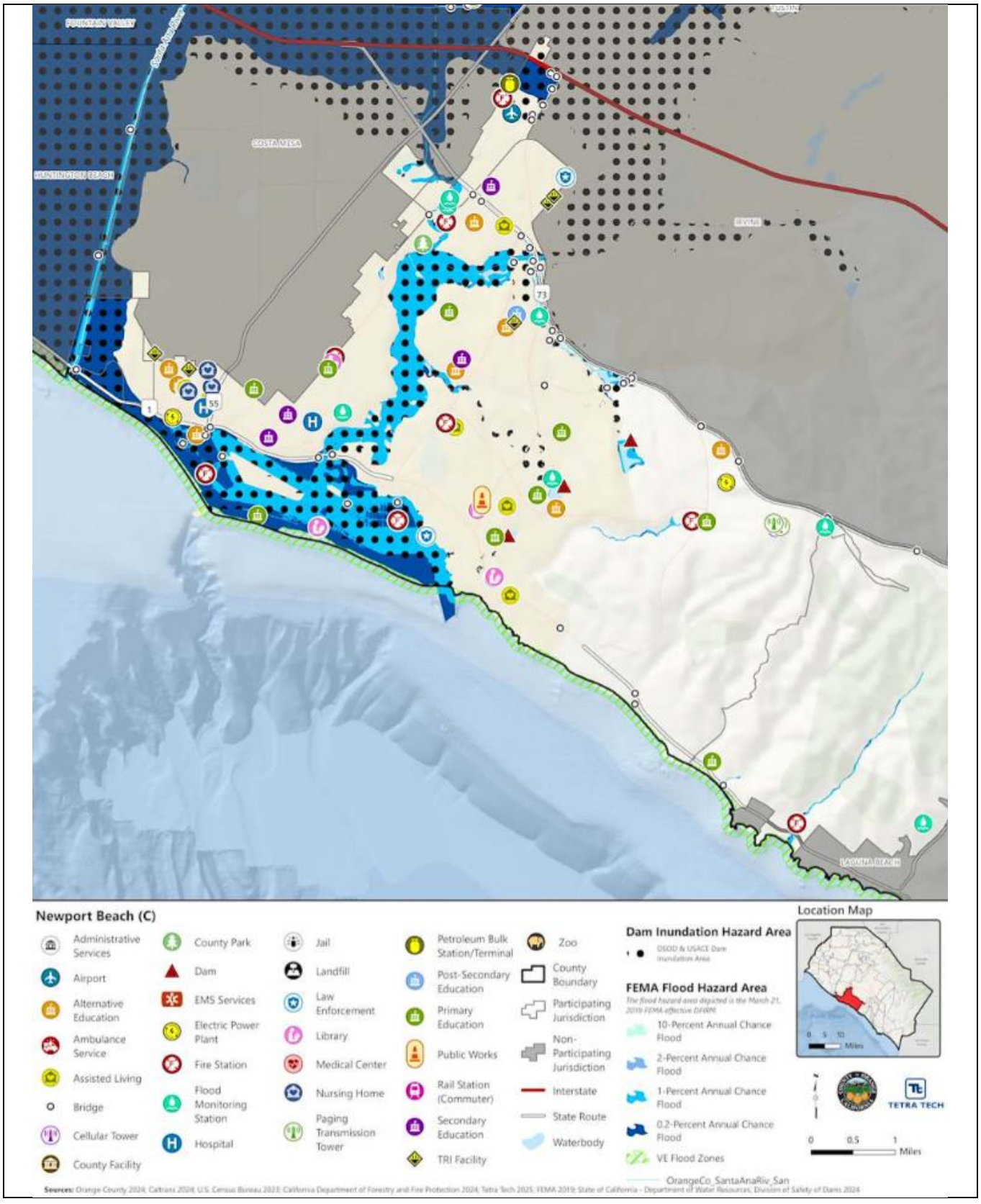
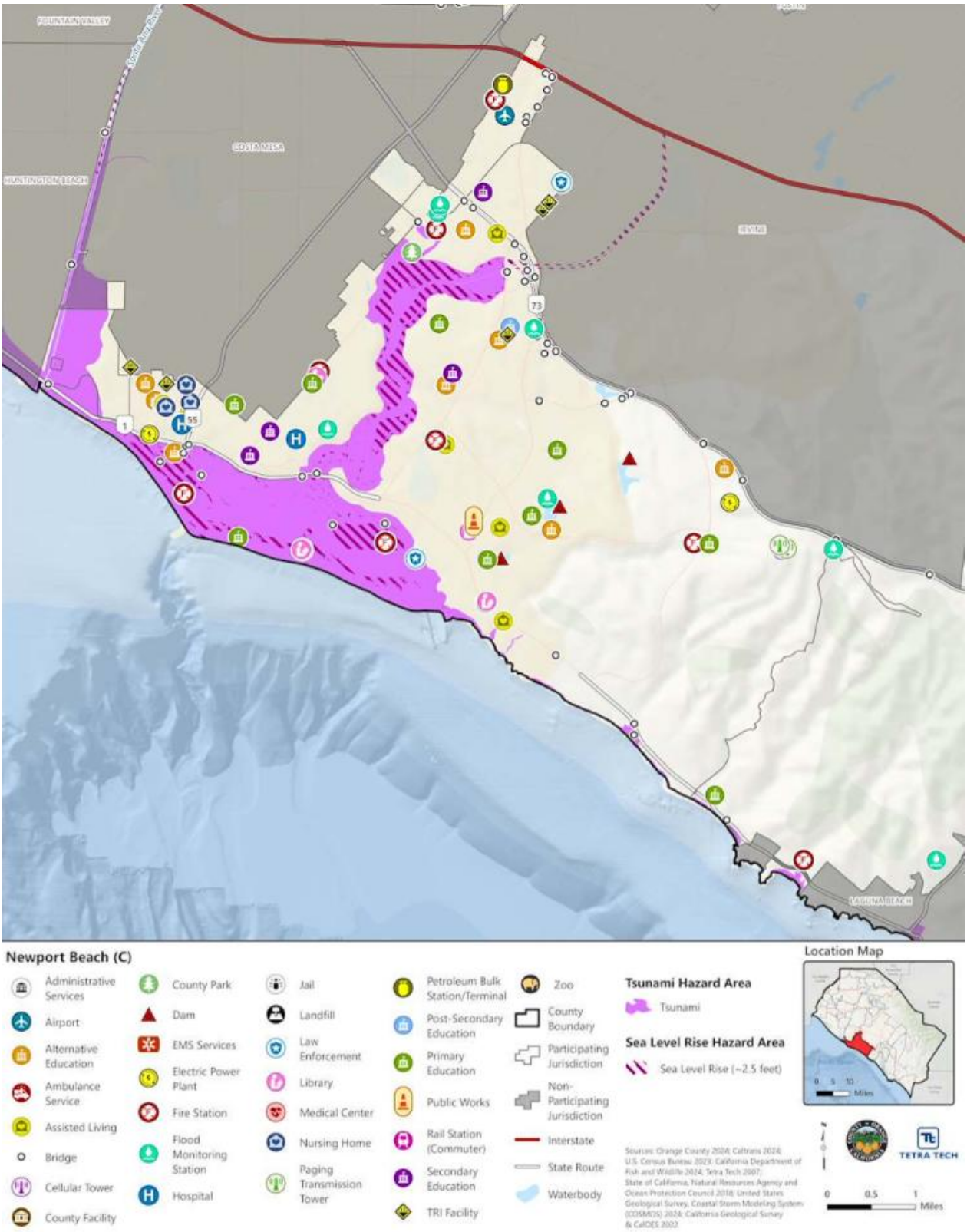


Figure 4-2. City of Newport Beach Tsunami and Sea Level Rise Hazard Area Extent and Location Map



4.6.2 Hazard Event History

The history of natural and non-natural hazard events in Orange County is detailed in Volume I, where each hazard profile includes a chronology of historical events that have affected the County and its municipalities. Table 4-14 provides details on loss and damage in City of Newport Beach during hazard events since 2020.

Table 4-14. Hazard Event History in the City of Newport Beach

Dates of Event	Event Type (Disaster Declaration)	Summary of Event	Summary of Damage and Losses in Newport Beach
September 16, 2015	-	An 8.3 magnitude earthquake off Chile's coast on the 16th prompted a tsunami advisory from Orange County to north of San Luis Obispo. Beaches, harbors, piers, and marinas in several cities, including Seal Beach and Huntington Beach, were closed through the 17th. Tsunami waves under one foot were observed along the Orange County coast. The Orange County EOC reported no significant flooding but warned of strong currents and dangerous waves.	No major damages or impacts recorded for the City.
January 18, 2017 – January 23, 2017	DR-4305-CA	Severe winter storm, mudslides, and flooding occurred throughout the region. Water damage and disruptions were seen in the County.	No major damages or impacts recorded for the City.
January 22, 2017	-	Heavy rain caused flash flooding across Orange County, resulting in $100,000 in property damages. A water rescue took place on Hamilton Ave. at the Santa Ana River in Huntington Beach. Streets from Sunset Beach to Santa Ana to Newport Beach were flooded with 1-3 feet of water. Many vehicles were stranded in floodwaters, including several along Highway 55.	No major damages or impacts recorded for the City.
February 17, 2017	-	Flood waters from the East Garden Grove-Wintersburg Channel overflowed, causing $50,000 in property damages and flooding a mobile home park.	No major damages or impacts recorded for the City.
May 24, 2017	-	High tides of 6.5 feet caused minor street flooding and $10,000 in property damages on Balboa Island, with some water entering houses near 36th and Finley Streets. The flooding was exacerbated by the recent demolition of a protective sea wall.	No major damages or impacts recorded for the City.
October 7, 2017	-	Lifeguards reported 6-8 ft surf on the 7th and 8th in Newport and Huntington Beach, with peak waves of 15 ft at the Wedge. Coastal flooding during high tide on the Balboa Peninsula in Newport Beach caused $25,000 in property damages. The beach parking lot, nearby streets, and homes were flooded, and several cars were swamped. In Capistrano Beach, large waves shattered a window in a home.	No major damages or impacts recorded for the City.
February 13, 2019	-	Flash flooding occurred in Laguna Beach with up to 2 inches of rain in 3 hours inundated storm channels, causing $80,000 in property damages. Streets were closed, and homes were threatened by the rising waters.	No major damages or impacts recorded for the City.
April 6, 2020	-	Heavy rainfall occurred in San Juan Capistrano which resulted in one inch of rain in just 20 minutes. In Silverado	No major damages or impacts recorded for the City.

Dates of Event	Event Type (Disaster Declaration)	Summary of Event	Summary of Damage and Losses in Newport Beach
		Canyon, 0.88 of rain was reported in 1 hour from two rain gauges.	
July 3, 2020	-	High tide near 6.8 feet and high surf caused minor coastal flooding in Newport Beach, resulting in $40,000 in property damages. Flooding extended up to three blocks inland, and a sailboat was washed ashore and destroyed.	No major damages or impacts recorded for the City.
March 10, 2021	-	Mud and debris flows from the Bond Fire caused $75,000 in property damages, damaging 8 vehicles and 6 homes. Swift water rescues were performed around 6 to 7 am. Mud covered at least 3 locations on Silverado Canyon Road and at Silverado Cafe, with rainfall rates reaching 0.20 inches in 15 minutes.	No major damages or impacts recorded for the City.
December 14, 2021	-	Debris flows from the Bond Fire scar and Silverado Canyon caused $800,000 in property damages. Santiago Creek Road was blocked by high water and mud, while Jackson Creek Road was flooded with mud and debris. Rainfall rates reached up to 1.2 inches at Irvine Lake and Santiago Canyon.	No major damages or impacts recorded for the City.
January 15, 2022	-	A Tsunami Advisory was issued at 5:03 AM for the Orange County Coast. Wireless Emergency Alerts and sirens were activated. The first wave arrived around 8 AM, causing coastal damage, including a drifting buoy off Huntington Bay.	No major damages or impacts recorded for the City.
January 8, 2023 – January 31, 2023	EM-3591-CA	EM-3591-CA was an emergency declaration for California due to severe winter storms, flooding, and mudslides from January 8 to January 31, 2023. Issued on January 9, 2023, it provided federal assistance to support state, local, and tribal response efforts.	No major damages or impacts recorded for the City.
March 1, 2023	-	Caltrans issued a Sig Alert for flooding at the I-5 and Highway 55 transition, causing $10,000 in property damages. Approximately 0.8 inches of rain fell in the area.	March 3, heavy rains from a winter storm cause a landslide in the Upper Newport Bay Ecological Reserve that resulted in the complete loss of one Single Family residence and remediation efforts to save two more homes.
March 9, 2023 – July 20, 2023	EM-3592-CA	Local media reported coastal flooding up to 18 inches deep near Seal Beach Pier due to high tide and surf. At least one car was swamped, but no damage to homes or businesses was confirmed.	No major damages or impacts recorded for the City.

EM = Emergency Declaration (FEMA); FEMA = Federal Emergency Management Agency; DR = Major Disaster Declaration (FEMA); N/A = Not applicable
Source: NWS, 2024; FEMA, 2024

4.6.3 Hazard Ranking and Vulnerabilities

The hazard profiles in Volume I have detailed information regarding each planning partner's vulnerability to the identified hazards. The following presents key risk assessment results for the City of Newport Beach.

Hazard Ranking

The participating jurisdictions have differing degrees of vulnerability to the hazards of concern, so each jurisdiction ranked its own degree of risk to each hazard. The community-specific hazard ranking is based on problems and impacts identified by the risk assessment presented in Volume I. The ranking process involves an assessment of the likelihood of occurrence for each hazard; the potential impacts of the hazard on people, property, and the economy; community capabilities to address the hazard; and changing future climate conditions.

Table 4-15 shows the City of Newport Beach's final hazard rankings for identified hazards of concern. Mitigation action development uses the ranking to target hazards with the highest risk. Hazards with a risk ranking of "low," such as Flood and Sea Level Rise may not present the most risk but remain a concern and mitigation action priority for the County and City of Newport Beach. Stakeholder feedback indicates although Flood risk ranking is low, Orange County communities are still focused on addressing mitigation projects related to the hazard. In addition, hazards ranked as "high," such as coastal flood, does not necessarily indicate a surety of the hazard occurring rather this ranking suggests that if a coastal flooding were to occur the potential impacts on the people, property, and economy would be very significant. The risk associated with "high" ranking are categorized as low-probability and high-consequence events.

Table 4-15. Hazard Ranking

Hazard	Rank
Flood	Low
Riverine Flood	Medium
Coastal Flood	High
Sea Level Rise	Low
Tsunami	Medium
Dam Failure	Medium

Note: The scale is based on the hazard rankings established in Volume I, modified as appropriate based on review by the jurisdiction

Critical Facilities

Table 4-16 identifies those critical facilities in the community that are located in the 1 percent and 0.2 percent annual chance event floodplains – i.e., Special Flood Hazard Areas (SFHA).

Table 4-16. Critical Facility Exposure to the Special Flood Hazard Area (SFHA)

Name	Type	SFHA Exposure	
		1% Annual Chance Event	0.2% Annual Chance Event
City Hall - City of Newport Beach	Administrative Services	N	N
Carden Hall, Inc	Alternative Education	N	N
Harbor Day School	Alternative Education	N	N
Newport Christian School	Alternative Education	N	N
Newport Montessori	Alternative Education	N	N
Our Lady Queen of Angels School	Alternative Education	N	N
Pacifica Christian High School-Orange County	Alternative Education	N	N
Sage Hill	Alternative Education	N	N
The Sawyer School	Alternative Education	Y	Y
ATRIA NEWPORT BEACH	Assisted Living	N	N

Name	Type	SFHA Exposure	
		1% Annual Chance Event	0.2% Annual Chance Event
ATRIA NEWPORT PLAZA	Assisted Living	N	N
CLEARWATER NEWPORT BEACH	Assisted Living	N	N
CROWN COVE	Assisted Living	N	N
NEWPORT BEACH MEMORY CARE	Assisted Living	N	N
THE SIGNATURE RESIDENCE INC	Assisted Living	N	N
VIVANTE NEWPORT CENTER	Assisted Living	N	N
BALBOA ISLAND CHANNEL - Bridge	Bridge	Y	Y
BIKE PATH - Bridge	Bridge	N	Y
BIRCH ST - Bridge	Bridge	N	N
BISON AVE - Bridge	Bridge	N	N
BONITA CANYON - Bridge	Bridge	N	N
BONITA CANYON ROAD - Bridge	Bridge	N	N
BONITA CREEK - Bridge	Bridge	N	N
BONITA CREEK CHANNEL - Bridge	Bridge	N	N
BONITA CREEK CHANNEL - Bridge	Bridge	N	N
CAMPUS DRIVE - Bridge	Bridge	N	N
GRAND CANAL - Bridge	Bridge	N	Y
JAMBOREE ROAD - Bridge	Bridge	N	N
JAMBOREE-S73 ON RA - Bridge	Bridge	N	N
LOS TRANSCOS CREEK - Bridge	Bridge	N	N
MACARTHUR BLVD - Bridge	Bridge	N	N
MACARTHUR-N73 ONRA - Bridge	Bridge	N	N
MACARTHUR-S73 ONRA - Bridge	Bridge	N	N
NWPT COAST GOLF COURSE UC - Bridge	Bridge	N	N
RIVO ALTO - Bridge	Bridge	Y	Y
ROUTE 1 - Bridge	Bridge	N	N
S73-BISON OFF-RAMP - Bridge	Bridge	N	N
S73-BONITA CYN OFF - Bridge	Bridge	N	N
S73-MACARTHUR OFF - Bridge	Bridge	N	N
S73-UNIVERSITY OFF - Bridge	Bridge	N	N
SAN DIEGO CREEK CHANNEL - Bridge	Bridge	N	N
SAN DIEGO CREEK CHANNEL - Bridge	Bridge	N	N
SAN JOAQUIN RSRVR O'FLOW - Bridge	Bridge	N	Y
SANTA ANA DELHI CHANNEL - Bridge	Bridge	N	Y
SANTA ANA DELHI CHANNEL - Bridge	Bridge	N	Y
SR 55 - Bridge	Bridge	N	N
SR 73 NB - Bridge	Bridge	N	N
SR 73 SB - Bridge	Bridge	N	N
SR 73 SB - Bridge	Bridge	N	N
SR 73 SB - Bridge	Bridge	N	N
SR 73 SB - Bridge	Bridge	N	N

Name	Type	SFHA Exposure	
		1% Annual Chance Event	0.2% Annual Chance Event
SR 73 SB - Bridge	Bridge	N	N
STATE ROUTE 1 - Bridge	Bridge	N	Y
STATE ROUTE 1 - Bridge	Bridge	N	N
STATE ROUTE 1 - Bridge	Bridge	N	N
STATE ROUTE 55 - Bridge	Bridge	N	Y
WATERS WAY - Bridge	Bridge	Y	Y
WEST LIDO CHANNEL - Bridge	Bridge	N	Y
WILDLIFE UNDERCROSSING - Bridge	Bridge	N	N
AT&T Mobility Spectrum, LLC	Cellular Tower	N	N
Upper Newport Bay Nature Preserve	County Park	N	N
Big Canyon	Dam	N	N
Harbor View	Dam	N	N
San Joaquin Reservoir	Dam	N	N
GRS COYOTE CANYON	Electric Power Plant	N	N
HOAG HOSPITAL COGEN PLANT	Electric Power Plant	N	N
Newport Beach Fire Department Station 1	Fire Station	N	Y
Newport Beach Fire Department Station 2	Fire Station	N	Y
Newport Beach Fire Department Station 3	Fire Station	N	N
Newport Beach Fire Department Station 4	Fire Station	N	Y
Newport Beach Fire Department Station 5	Fire Station	N	N
Newport Beach Fire Department Station 6	Fire Station	N	N
Newport Beach Fire Department Station 7	Fire Station	N	N
Newport Beach Fire Department Station 8	Fire Station	N	N
Newport Bay Watershed - Bonita Canyon Channel Hydstra Flood Station	Flood Monitoring Station	N	N
Newport Bay Watershed - Corona Del Mar Hydstra Flood Station	Flood Monitoring Station	N	N
Newport Bay Watershed - Costa Mesa Channel (G02) Hydstra Flood Station	Flood Monitoring Station	N	N
Newport Bay Watershed - Santa Ana Delhi Channel Hydstra Flood Station	Flood Monitoring Station	N	N
Newport Coastal Streams Watershed - Newport Coast Hydstra Flood Station	Flood Monitoring Station	N	N
Hoag Hospital Newport Beach	Hospital	N	N
Newport Bay Hospital	Hospital	N	N
Civil Process Unit - Harbor	Law Enforcement	N	N
Harbor Justice Center	Law Enforcement	N	N
Harbor Justice Center	Law Enforcement	N	N
Harbor Patrol	Law Enforcement	N	N
Newport Beach Library - Balboa Branch	Library	N	Y
Newport Beach Library - Central Library	Library	N	N
Newport Beach Library - Corona del Mar Branch	Library	N	N

Name	Type	SFHA Exposure	
		1% Annual Chance Event	0.2% Annual Chance Event
Newport Beach Library - Crean Mariners Branch	Library	N	N
CRYSTAL COVE CARE CENTER	Nursing Home	N	N
FLAGSHIP HEALTHCARE CENTER	Nursing Home	N	N
NEWPORT NURSING AND REHABILITATION CENTER	Nursing Home	N	N
AMS Spectrum Holdings, LLC	Paging Transmission Tower	N	N
Spok, Inc.	Paging Transmission Tower	N	N
Spok, Inc.	Paging Transmission Tower	N	N
INTERIOR DESIGNERS INSTITUTE	Post-Secondary Education	N	N
Abraham Lincoln Elementary	Primary Education	N	N
Eastbluff Elementary	Primary Education	N	N
Harbor View Elementary	Primary Education	N	N
Mariners Elementary	Primary Education	N	N
Newport Coast Elementary	Primary Education	N	N
Newport Elementary	Primary Education	N	Y
Newport Heights Elementary	Primary Education	N	N
Roy O. Andersen Elementary	Primary Education	N	N
Public Works - City of Newport Beach	Public Works	N	N
Corona del Mar High	Secondary Education	N	N
Horace Ensign Intermediate	Secondary Education	N	N
Newport Harbor High	Secondary Education	N	N
Suncoast Preparatory Academy	Secondary Education	N	N
AMETEK AEROSPACE INC	TRI Facility	N	N
CONEXANT SYSTEMS INC	TRI Facility	N	N
HIXSON METAL FINISHING	TRI Facility	N	N
LORAL AERONUTRONIC	TRI Facility	N	N
TOWER SEMICONDUCTOR	TRI Facility	N	N

Source: California Department of Education 2024; Caltrans 2024; HIFLD 2022, 2023, 2024; Orange County 2022, Orange County Sheriff's Department 2024; U.S. Geological Survey 2024; USACE 2024
Note: N = Facility is NOT exposed to the SFHA Zone (1% / 0.2%); Y = Facility IS exposed to the SFHA Zone (1% / 0.2%).

Dam Hazard Vulnerability

The U.S. Army Corps of Engineers (USACE) operates and maintains approximately 740 dams across the United States, providing benefits such as flood risk management, water supply, hydropower, and environmental stewardship (USACE 2021). USACE classifies its dams into five Dam Safety Action Classes (DSAC), ranging from DSAC I (highest risk) to DSAC V (lowest risk), based on factors like event probability, probability of failure, and potential consequences (USACE 2010). This risk-informed approach ensures that dam safety decisions

prioritize life safety and effective resource allocation (USACE 2021). Refer to Table 4-17 for the USACE dams located in the City of Newport Beach.

Table 4-17. USACE Dams and Population in Dam Inundation Area for City of Newport Beach

Dam Name	Total Population (2020 Decennial)	Estimated Number of People Located in Dam Inundation Area	Estimated Percent Total of People Located in Dam Inundation Area
Brea Dam	85,239	0	0.0%
Carbon Canyon Dam	85,239	0	0.0%
Fullerton Dam	85,239	0	0.0%
Prado Dam	85,239	13,526	15.9%
Whittier Dam	85,239	0	0.0%

Source: U.S. Census Bureau 2020; USACE 2024

The California Division of Safety of Dams (DSOD) oversees the design, construction, and maintenance of over 1,200 jurisdictional-sized dams in California (CA DWR 2025). Established in 1929, DSOD ensures dam safety by conducting annual inspections, reviewing structural and hydrological analyses, and approving modifications to existing dams. Dams are classified based on their downstream hazard potential, which ranges from high to low, reflecting the potential impact on life and property in the event of a failure (CA Office of Emergency Services GIS 2020). This classification system helps prioritize safety measures and resource allocation to protect communities and infrastructure. Refer to Table 4-18 for the CA DSOD dams located in the City of Newport Beach.

Table 4-18. CA DSOD Dams and Population in Dam Inundation Area for City of Newport Beach

Dam Name	Total Population (2020 Decennial)	Estimated Number of People Located in Dam Inundation Area	Estimated Percent Total of People Located in Dam Inundation Area
Big Canyon Dam	85,239	454	0.5%
Diemer Dam	85,239	0	0.0%
Deimer No.8 Dam	85,239	0	0.0%
Deimer Ozone Dam	85,239	0	0.0%
Dove Canyon Dam	85,239	0	0.0%
Harbor View Dam	85,239	173	0.2%
Mission Viejo Dam	85,239	0	0.0%
Lower Peters Canyon Dam	85,239	0	0.0%
Peters Canyon Dam	85,239	0	0.0%
Portola Dam	85,239	0	0.0%
Rattlesnake Dam	85,239	0	0.0%
Rossmoor Dam	85,239	0	0.0%
San Joaquin Dam	85,239	689	0.8%
Sand Canyon	85,239	0	0.0%
Santiago Dam	85,239	4,555	5.3%
Sulphur Creek Dam	85,239	0	0.0%
Syphon Dam	85,239	0	0.0%
Trampas Dam	85,239	0	0.0%
Upper Chiquita Dam	85,239	0	0.0%

Dam Name	Total Population (2020 Decennial)	Estimated Number of People Located in Dam Inundation Area	Estimated Percent Total of People Located in Dam Inundation Area
Upper Oso Dam	85,239	0	0.0%
Villa Park Dam	85,239	0	0.0%
Walnut Dam	85,239	0	0.0%
Yorba Dam	85,239	0	0.0%

Source: U.S. Census Bureau 2020; State of California - Department of Water Resources, Division of Safety of Dams 2024

4.6.4 Identified Issues

After review of the City of Newport Beach's event history, hazard rankings, hazard location, and current capabilities, the City identified the following vulnerabilities within the community:

- Balboa Island stormwater pumping station needs capacity improvements to handle larger flooding events.
- Large quantities of bay spoils stockpiled since the 1960's in Big Canyon estuary have created a large mosquito breeding area. Bay spoils have selenium-laden soils and are invested with an invasive beetle known as the Polyphagous Shot Hole Bore.
- Need to evaluate recently restored coastal habitats for performance metrics.
- Need to reduce sedimentation and maintain water quality along shoreline.
- Newport Bay and canyon streams contain identified contaminates exceeding TMDL requirements under the State NPDES Program.
- Balboa Island seawalls reaching the end of lifespan, needing replacement. As sea levels continue to rise, so too is the risk of overtopping.
- City bulkheads and seawalls need replacement to continue to fully protect street ends and boatyards.
- Prolonged sedimentation of harbor and surrounding waterways restricts navigation but also inhibits proper storage of sediment from feeder tributaries, which reduces navigability as well as reduces the capacity of the harbor to serve as a communal storage basin during flooding events.
- Tide gates / valves need to be replaced to continue keeping urban stormwater flows from entering harbor during high-water events.

4.7 MITIGATION STRATEGY AND PRIORITIZATION

City of Newport Beach participated in the mitigation strategy workshop for this FMP to identify appropriate actions to include in a mitigation action catalogue. Its comprehensive consideration of all possible activities to address flood-related hazards of concern included review of the six CRS action categories:

- **Property Protection (PP)** -These actions include public activities to reduce hazard losses or actions that involve (1) modification of existing buildings or structures to protect them from a flood hazard or (2) removal of structures from the flood hazard area.
- **Preventative Measures (PR)** - Government, administrative, or regulatory actions, or processes that influence the way land and buildings are developed and built. Examples include planning and zoning, capital improvement plans, etc.

- **Public Information (PI)** - Actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them.
- **Natural Resource Protection (NPR)** - Actions that minimize flood hazard loss and preserve or restore the functions of natural systems.
- **Structural Flood Control Project (SP)** - Actions that involve the construction of structures to reduce the impact of a flood hazard. Such structures include dams, setback levees, floodwalls, retaining walls, and safe rooms.
- **Emergency Services (ES)** - Actions that protect people and property during and immediately following a disaster or flood related hazard event. Services include warning systems, emergency response services, and the protection of essential facilities.

The action worksheets included at the end of this annex list the mitigation actions that the City of Newport Beach would like to pursue in the future to reduce the effects of flood-related hazards. The actions are dependent upon available funding (grants and local match availability) and may be modified or omitted at any time based on the occurrence of new flood-related hazard events and changes in City priorities. Action summary information is provided in Table 4-19.

Volume I identifies 14 evaluation criteria for prioritizing the mitigation actions. To assist with rating each mitigation action as high, medium, or low priority, a numeric rank is assigned (-1, 0, or 1) for each of the evaluation criteria. Table 4-20 provides a summary of the prioritization of all proposed mitigation actions for the FMP.

Table 4-19. Mitigation Action Summary

Project Number	Project Name	Flood Hazard	Responsible Party	Brief Summary of the Problem and the Solution (Project)	CRS Category
2025-NewportBeach-FMP1	Balboa Island Drainage Master Plan / Pump Station	Flood, Riverine Flood	O.C. Department of Public Works	Balboa Island stormwater pumping station needs capacity improvements to handle larger flooding events. These improvements consist of upgrading existing storm water pump stations along with the drainage collection system, as outlined in the Balboa Island Drainage Master Plan.	NRP, SP
2025-NewportBeach-FMP2	Big Canyon Restoration - Phase 3	Coastal Flooding, Sea Level Rise	O.C. Department of Public Works	Large quantities of bay spoils have been stockpiled since the 1960's in Big Canyon estuary, creating a large mosquito breeding area. The selenium-laden dredge spoil is also invested with an invasive beetle known as the Polyphagous Shot Hole Bore. The estuary restoration project will remove bay spoils, improve water quality, remove invasive beetles, and restore approximately 14-acres of area by re-establishing native vegetation to provide habitat for aquatic birds, fish and other wildlife.	NRP
2025-NewportBeach-FMP3	Environmental Habitat Restoration - Monitoring and Maintenance	Coastal Flooding, Sea Level Rise	O.C. Department of Public Works	Need to evaluate recently restored coastal habitats for performance metrics. Project entails the hiring of qualified consultants and contractors to monitor and maintain newly restored areas by removing invasive plants, adjusting irrigation watering times, perform endangered bird surveys, quantify the extent and health of native plants, and provide recommendations for improving the performance of the restoration.	NRP
2025-NewportBeach-FMP4	Newport Dunes Infiltration Basin	Coastal Flooding, Sea Level Rise	O.C. Department of Public Works	Need to reduce sedimentation and maintain water quality along shoreline. Project will entail constructing a large infiltration gallery on the east side of Newport Dunes lagoon and constructing several smaller infiltration galleries next to existing catch basins, as well as the relocation of the existing outlet structure.	NRP, SP
2025-NewportBeach-FMP5	TMDL Compliance / Water Quality Improvements	Coastal Flooding, Sea Level Rise	O.C. Department of Public Works	Newport Bay and feeder canyon streams contain have known contaminates that exceed TMDL requirements under the State NPDES Program. Project completion will require completing a variety of different project types, which may entail preparing water quality improvement work plans, performing water quality and stream flow monitoring, analyzing data, implementing mitigation projects (including storm drain inserts), and working with upstream stakeholders, regulatory agencies, and non-governmental agencies.	PR, PI, NRP, SP
2025-NewportBeach-FMP6	Action 2025-NewportBeach-FMP6. Balboa Island Seawall	Coastal Flooding, Sea Level Rise	O.C. Department of Public Works	Balboa Island seawalls are reaching the end of their usable life and need replacement. The risk of overtopping rises along with global sea levels. This project entails planning, permitting, design and construction of seawall replacements, and may include increasing the overall seawall height.	SP

Project Number	Project Name	Flood Hazard	Responsible Party	Brief Summary of the Problem and the Solution (Project)	CRS Category
2025-NewportBeach-FMP7	Harbor & Ocean Bulkheads / Seawalls / Structure Repairs	Coastal Flooding, Sea Level Rise	O.C. Department of Public Works	City bulkheads and seawalls need replacement in order for city streets and boatyards to be fully protected from high-water. Project may include increasing the seawall height but may also include full seawall replacement in those specified City streets and boat yards where frequent flooding occurs during high tides and storm events.	SP
2025-NewportBeach-FMP8	Newport Harbor-Wide Dredging	Flooding, Coastal Flooding, Sea Level Rise	U.S. Army Corp of Engineers	Newport Harbor and surrounding waterways have sustained prolonged periods of sedimentation, which results in restricted navigation, inhibits proper storage of sediment from feeder tributaries, and reduces the capacity of the harbor as a communal stormwater / flood storage basin. This project will entail dredging of navigation channels within the Harbor as well as a variety of monitors and tests to assess water quality, sedimentation, biologic organisms, and other project related requirements.	NRP
2025-NewportBeach-FMP9	Tide Valve Replacement - Peninsula	Coastal Flooding	O.C. Department of Public Works	Tide gates / valves need to be replaced in order for them to continue keeping urban stormwater flows out of Newport Harbor during high-water / flooding events. This project entails the replacement of tide gates located throughout the Newport Harbor area.	NRP, SP

Note: Volume I, Section 6 (Mitigation Strategy) conveys guidance on prioritizing mitigation actions. Low (0-6), Medium (7-10), High (11-14).

Table 4-20. Summary of Prioritization of Actions

Project Number	Project Name	Scores for Evaluation Criteria															High / Medium / Low
		Life Safety	Property Protection	Cost-Effectiveness	Political	Legal	Fiscal	Environmental	Social Vulnerability	Administrative	Hazards of Concern	Climate Change	Timeline	Community Lifelines	Other Local Objectives	Total	
2025-NewportBeach-FMP1	Balboa Island Drainage Master Plan / Pump Station	1	1	0	1	1	1	1	1	0	1	1	1	1	1	12	High
2025-NewportBeach-FMP2	Big Canyon Restoration - Phase 3	0	0	0	1	1	1	1	1	0	1	1	1	0	1	9	Medium
2025-NewportBeach-FMP3	Environmental Habitat Restoration - Monitoring and Maintenance	0	0	0	1	1	1	1	0	0	1	1	1	0	1	8	Medium
2025-NewportBeach-FMP4	Newport Dunes Infiltration Basin	0	0	0	1	1	1	1	0	0	1	1	1	0	1	8	Medium
2025-NewportBeach-FMP5	TMDL Compliance / Water Quality Improvements	0	0	0	1	1	1	1	0	0	1	0	1	1	1	7	Medium
2025-NewportBeach-FMP6	Action 2025-NewportBeach-FMP6. Balboa Island Seawall	1	1	0	1	1	1	1	1	0	1	1	1	1	1	12	High
2025-NewportBeach-FMP7	Harbor & Ocean Bulkheads / Seawalls / Structure Repairs	1	1	0	1	1	1	1	1	0	1	1	1	1	1	12	High
2025-NewportBeach-FMP8	Newport Harbor-Wide Dredging	0	0	0	1	1	1	1	0	0	1	0	1	1	1	8	Medium
2025-NewportBeach-FMP9	Tide Valve Replacement - Peninsula	0	0	0	1	1	1	1	0	0	1	0	1	1	1	8	Medium

Low (0-6), Medium (7-10), High (11-14).

Action 2025-NewportBeach-FMP1. Balboa Island Drainage Master Plan / Pump Station

Lead Agency:	Department of Public Works
Supporting Agencies:	Department of Community Development
Hazard(s) of Concern:	Flood, Riverine Flood
Description of the Problem:	Balboa Island stormwater pumping station needs capacity improvements to handle larger flooding events.
Description of the Solution:	Upgrading existing storm water pump stations and the drainage collection system as outlined in the Balboa Island Drainage Master Plan.
Estimated Cost:	High
Potential Funding Source:	CIP – General Fund, Neighborhood Enhancement, Tidelands Capital
Implementation Timeline:	Long-term (> 5 years)
Benefits:	Less frequent impacts to area roadways during high water / flooding events.
CRS Category	NRP, SP
Priority	High

Action 2025-NewportBeach-FMP2. Big Canyon Restoration - Phase 3

Lead Agency:	Department of Public Works
Supporting Agencies:	Department of Community Development
Hazard(s) of Concern:	Coastal Flooding, Sea Level Rise
Description of the Problem:	Large quantities of bay spoils stockpiled since the 1960's in Big Canyon estuary have created a large mosquito breeding area. Bay spoils have selenium-laden soils and are invested with an invasive beetle known as the Polyphagous Shot Hole Bore.
Description of the Solution:	Estuary restoration project will remove bay spoils, improve water quality, invasive beetles, and restore approx. 14 acres of area with native vegetation to provide habitat for aquatic birds, fish and other wildlife.
Estimated Cost:	High
Potential Funding Source:	CIP - Ocean Protection Council, State Coastal Conservancy, Wildlife Conservation Board
Implementation Timeline:	Short-term (< 5 years)
Benefits:	Creates and endangered species habitat, and an adaptive shoreline to sea level rise. Project will provide educational opportunities around the County.
CRS Category	NRP
Priority	Medium

Action 2025-NewportBeach-FMP3. Environmental Habitat Restoration - Monitoring and Maintenance

Lead Agency:	Department of Public Works
Supporting Agencies:	Department of Community Development
Hazard(s) of Concern:	Coastal Flooding, Sea Level Rise
Description of the Problem:	Need to evaluate recently restored coastal habitats for performance metrics
Description of the Solution:	Hire qualified consultants and contractors to monitor and maintain newly restored areas by removing invasive plants, adjusting irrigation watering times, perform endangered bird surveys, quantify the extent and health of native plants, and provide recommendations for improving the performance of the restoration.
Estimated Cost:	High
Potential Funding Source:	CIP - Oceanfront Encroachment, Upper Newport Bay Restoration, Environmental Liability
Implementation Timeline:	Short-term (< 5 years)
Benefits:	Maintains endangered species habitat, and an adaptive shoreline to sea level rise. Project will provide educational opportunities around the County.
CRS Category	NRP
Priority	Medium

Action 2025-NewportBeach-FMP4. Newport Dunes Infiltration Basin

Lead Agency:	Department of Public Works
Supporting Agencies:	Department of Community Development
Hazard(s) of Concern:	Coastal Flooding, Sea Level Rise
Description of the Problem:	Need to reduce sedimentation and maintain water quality along shoreline.
Description of the Solution:	Construct new large infiltration gallery on east side of Newport Dunes lagoon, construct smaller infiltration galleries next to existing catch basins, relocation of existing outlet structure.
Estimated Cost:	High
Potential Funding Source:	CIP - Tidelands Capital, Measure M (Competitive), Contributions
Implementation Timeline:	Short-term (< 5 years)
Benefits:	Improve dry-weather stormwater runoff flows, reduce concentrated sedimentation / increase mixing. Maintains healthy coastal zone in order to continue serving as a mitigating buffer zone along the developed shoreline.
CRS Category	NRP, SP
Priority	Medium

Action 2025-NewportBeach-FMP5. TMDL Compliance / Water Quality Improvements

Lead Agency:	Department of Public Works
Supporting Agencies:	Department of Community Development
Hazard(s) of Concern:	Coastal Flooding, Sea Level Rise
Description of the Problem:	Newport Bay and canyon streams contain identified contaminates exceeding TMDL requirements under the State NPDES Program.
Description of the Solution:	Tasks may include preparing water quality improvement work plans, performing water quality and stream flow monitoring, analyzing data, implementing mitigation projects (including storm drain inserts), and working with upstream stakeholders, regulatory agencies, and non-governmental agencies
Estimated Cost:	High
Potential Funding Source:	CIP - Tidelands Maintenance
Implementation Timeline:	Ongoing
Benefits:	Maintain TMDL thresholds required for compliance under the State's NPDS General Permit.
CRS Category	PR, PI, NRP, SP
Priority	Medium

Action 2025-NewportBeach-FMP6. Balboa Island Seawall

Lead Agency:	Department of Public Works
Supporting Agencies:	Department of Community Development
Hazard(s) of Concern:	Coastal Flooding, Sea Level Rise
Description of the Problem:	Balboa Island seawalls reaching the end of lifespan, needing replacement. As sea levels continue to rise, so too is the risk of overtopping.
Description of the Solution:	Planning, permitting, design and construction of seawall replacement, including raising overall height of seaway to accommodate rising sea levels.
Estimated Cost:	High
Potential Funding Source:	CIP - Tidelands Capital
Implementation Timeline:	Short-term (< 5 years)
Benefits:	Continue providing sheltered harbor and protection from coastal flooding.
CRS Category	SP
Priority	High

Action 2025-NewportBeach-FMP7. Harbor & Ocean Bulkheads / Seawalls / Structure Repairs

Lead Agency:	Department of Public Works
Supporting Agencies:	Department of Community Development
Hazard(s) of Concern:	Coastal Flooding, Sea Level Rise
Description of the Problem:	City bulkheads and seawalls need replacement to continue to fully protect street ends and boatyards
Description of the Solution:	Work may include increasing the seawall height or full wall replacement at select City street ends and boat yards, where flooding occurs during high tides and storm events.
Estimated Cost:	High
Potential Funding Source:	CIP - Tidelands Capital, Tidelands Maintenance
Implementation Timeline:	Long-term (> 5 years)
Benefits:	Continued protection during high tides and storm events.
CRS Category	SP
Priority	High

Action 2025-NewportBeach-FMP8. Newport Harbor wide Dredging

Lead Agency:	Army Corp of Engineers
Supporting Agencies:	Department of Public Works
Hazard(s) of Concern:	Flooding, Coastal Flooding, Sea Level Rise
Description of the Problem:	Prolonged sedimentation of harbor and surrounding waterways restricts navigation but also inhibits proper storage of sediment from feeder tributaries, which reduces navigability as well as reduces the capacity of the harbor to serve as a communal storage basin during flooding events.
Description of the Solution:	Dredging navigation channels of Newport Harbor, inclusive of water quality monitoring, sediment testing, biological monitoring and other project related requirements.
Estimated Cost:	High
Potential Funding Source:	CIP – Tidelands Capital
Implementation Timeline:	Short-term (< 5 years)
Benefits:	Preserves navigability, enhances storage of sediment upstream, increases harbor capacity during flooding events.
CRS Category	NRP
Priority	Medium

Action 2025-NewportBeach-FMP9. Tide Valve Replacement - Peninsula

Lead Agency:	Department of Public Works
Supporting Agencies:	Department of Community Development
Hazard(s) of Concern:	Coastal Flooding
Description of the Problem:	Tide gates / valves need to be replaced to continue keeping urban stormwater flows from entering harbor during high-water events.
Description of the Solution:	Replaces tide gates located throughout the harbor area with new tidal valves
Estimated Cost:	High
Potential Funding Source:	CIP - Tidelands Capital
Implementation Timeline:	Long-term (> 5 years)
Benefits:	Keeps urban stormwater runoff from entering harbor during high-water events.
CRS Category	NRP, SP
Priority	Medium

5. CITY OF SAN JUAN CAPISTRANO ANNEX

This jurisdictional annex to the Orange County Floodplain Management Plan (FMP) provides information to assist public and private sectors in the unincorporated areas with reducing losses from future hazard events. This annex is not guidance of what to do when a disaster occurs; its focus is on actions that can be implemented prior to a disaster to reduce or eliminate damage to property and people. The annex presents a general overview of the City of San Juan Capistrano, describes who participated in the planning process, assesses these area's risk, vulnerability, and capabilities, and outlines a strategy for achieving a more resilient community.

5.1 FLOODPLAIN MANAGEMENT PLANNING TEAM

The City of San Juan Capistrano identified primary and alternate FMP points of contact and developed this plan over the course of several months, with input from many City departments. The Engineering Department represented the community on the Orange County FMP Planning Partnership and supported the local planning process by securing input from people with specific knowledge to enhance the plan. All departments were asked to contribute to the annex development through reviewing and contributing to the capability assessment, reporting on the status of previously identified actions, and participating in action identification and prioritization.

Table 5-1 summarizes City officials who participated in the development of the annex and in what capacity. Additional documentation of the City's planning activities through Planning Partnership meetings is included in Volume I.

Table 5-1. Floodplain Management Planning Team

Primary Point of Contact	Alternate Point of Contact
Name/Title: Shawn Mousavi, MS, PE, TE, Senior Civil Engineer Address: 32400 Paseo Adelanto San Juan Capistrano, CA 92675 Phone Number: 949-443-6353 Email: smousavi@sanjuancapistrano.org	Name/Title: Noreen Swiontek, Environmental Programs Analyst Address: 32400 Paseo Adelanto San Juan Capistrano, CA 92675 Phone Number: 949-487-4307 Email: nswiontek@sanjuancapistrano.org
National Flood Insurance Program Floodplain Administrator	
Name/Title: Thomas Toman / Director of Public Works Address: 25925 Camino Del Avion, San Juan Capistrano, CA 92675 Phone Number: (949) 234-4580 Email: ttoman@sanjuancapistrano.org	
Additional Contributors	
Name/Title: Jeremy Hohnbaum Method of Participation: Provided NFIP and flood history information.	
Name/Title: Justin Inducil Method of Participation: Provided previous event history information. Provided information on building permits and known or anticipated major development. Provided information on Natural Floodplain Function Planning information.	
Name/Title: Nardy Kahn Method of Participation: Participated in the Kick-Off meeting.	
Name/Title: Christopher Shyy Method of Participation: Participated in the Kick-Off meeting.	

5.2 COMMUNITY PROFILE

5.2.1 Brief History

San Juan Capistrano stands out in Orange County and is a rare gem in California, with its roots tracing back to the earliest inhabitants of the region. Over the past 220 years, it has continually evolved, reflecting the dynamic history of California. California history, and therefore San Juan Capistrano history, is often divided into five major eras: Prehistory, the Spanish era, the Mexican/Rancho Era, Statehood, and the Twentieth Century. Each era brought distinct changes and influences, from the mission's prosperity and subsequent decline during the Mexican secularization to the transformation of the town in the 20th century. Today, San Juan Capistrano stands as a testament to its diverse historical roots and ongoing evolution (City of San Juan Capistrano n.d.).

5.2.2 Location

San Juan Capistrano, situated in the southern part of Orange County, California, is a delightful city known for its rich history and scenic beauty. Positioned conveniently between Dana Point and Mission Viejo, it is easily accessible via Interstate 5. The city is famous for the historic Mission San Juan Capistrano, often called the "Jewel of the Missions," and its charming surroundings. With a population of around 35,253 as of the 2020 Census, San Juan Capistrano seamlessly blends historical allure with modern conveniences. Its strategic location offers both residents and visitors a unique combination of cultural heritage and natural splendor, making it a standout destination in Orange County.

5.2.3 Governing Body Format

The City of San Juan Capistrano is governed by a City Council, which consists of five members elected by district to serve four-year terms. The Council is responsible for setting policies, passing ordinances, and overseeing the city's budget and operations. Elections for Council seats are held in November of even-numbered years, and the Mayor and Mayor Pro Tem are selected annually by the Council members (City of San Juan Capistrano n.d.). Additionally, the city has various commissions and committees that provide recommendations to the Council on specific issues. This structure ensures that the community's needs and concerns are addressed through a collaborative and representative governance model (City of San Juan Capistrano n.d.).

5.2.4 Population and Social Vulnerability

According to the U.S. Census, the 2020 population for City of San Juan Capistrano was 35,196. This is 3.8-percent of the participating jurisdiction population total.

Research has shown that some populations are at greater risk from hazard events because of decreased resources or physical abilities. These populations can be more susceptible to hazard events based on a number of factors including their physical and financial ability to react or respond during a hazard, and the location and construction quality of their housing. Data from the 2023 American Community Survey indicates that there are 1,592 people 5 years of age or younger, 7,124 people 65 years of age or older, 554 people who are non-English speaking, 2,530 people below the poverty threshold, and 3,572 people considered disabled.

5.3 JURISDICTIONAL CAPABILITY ASSESSMENT AND INTEGRATION

The City of San Juan Capistrano performed an inventory and analysis of existing capabilities, plans, programs, and policies that enhance its ability to implement mitigation strategies. Volume I describes the components included in the capability assessment and their significance for floodplain management planning. The jurisdictional assessment for this annex includes analyses of the following:

- Planning and regulatory capabilities
- Development and permitting capabilities
- Administrative and technical capabilities
- Fiscal capabilities
- Education and outreach capabilities
- Classification under various community mitigation programs
- Adaptive capacity to withstand hazard events

For a community to succeed in reducing long-term risk, floodplain management must be integrated into day-to-day local government operations. As part of the floodplain management analysis, planning and /policy documents were reviewed and each jurisdiction was surveyed to obtain a better understanding of their progress toward plan integration. Development of an updated mitigation strategy provided an opportunity for the City of San Juan Capistrano to identify opportunities for integrating mitigation concepts into ongoing City procedures.

5.3.1 Planning and Regulatory Capability and Integration

Table 5-2 summarizes the planning and regulatory tools that are available to the City of San Juan Capistrano.

Table 5-2. Planning and Regulatory Capability and Integration

	Jurisdiction has this?	Citation and Date (code chapter or name of plan, date of enactment or plan adoption)	Authority (local, county, state, federal)	Responsible Person, Department or Agency
CODES, ORDINANCES, & REGULATIONS				
Building Code	Yes	San Juan Capistrano Municipal Code Title 8 Building Regulations, Chapter 2 Building Code, 2/7/2023	Local	Building Division within the Development Services Department
How does this reduce risk from flood-related hazards? Chapter 2 establishes minimum standards for construction, design, and maintenance of buildings to ensure safety, health, and general welfare of the public.				

	Jurisdiction has this?	Citation and Date (code chapter or name of plan, date of enactment or plan adoption)	Authority (local, county, state, federal)	Responsible Person, Department or Agency
Zoning/Land Use Code	Yes	San Juan Capistrano Municipal Code Title 9 Land Use, Chapter 2 and Chapter 3, 4/1/2025	Local	Planning Division within the Development Services Department
How does this reduce risk from flood-related hazards? §9-2.321 Floodplain Land Use Permit. Covers the process of the floodplain land use permit §9-3.405 Floodplain Management District. Covers the floodplain management district and the standards for the areas located in the floodplain. §9-3.405 (c) Locational Standards §9-3.105 (d)(1) Site Development Standards. Floodplain land use projects shall result in no discernible net increase in water surface elevation … §9-3.105 (e) Land Use Standards §9-3.105 (e)(1) special flood hazard zones “A” and “AE” permitted uses subject to approval of a grading permit, if required, which complies with the standards of subsection (d) §9-3.105 (e) (2) Special Flood Hazard Zones “A” and “AE” permitted uses subject to the approval of a floodplain land use permit which complies with the standards of subsections (c) locations standards, and (d) standards. (a) to (d) list permitted uses §9-3.105 (e) (3) Special Flood Hazard Zones “AH” and “AO” permitted uses subject to approval of a grading permit, building permit, or development permit, if required) which complies with the standards of section (d). (a) to (c) list permitted uses §9-3.105 (e) (3) Special Flood Hazard Zones “AH” and “AO”, uses permitted subject to approval of a floodplain uses permit application which complies with the standards of subsection (c), location standards, and (d) site development standards. (a) to D) list permitted uses			
Subdivision Code	Yes	San Juan Capistrano Municipal Code Title 9 Land Use, Chapter 4 Subdivisions, 6/3/2008	Local	Planning Division within the Development Services Department
How does this reduce risk from flood-related hazards? Chapter 4 governs the division of land into smaller parcels, ensuring proper infrastructure, access, and services are provided to support orderly development and City needs.				
Site Plan Code	No	-	-	-
How does this reduce risk from flood-related hazards?				
Stormwater Management Code	Yes	San Juan Capistrano Municipal Code Title 8 Building Regulations, Chapter 14 Water Quality Regulations, 2/5/2019.	Local	Utilities Department
How does this reduce risk from flood-related hazards? Chapter 14 focuses on improving water quality by controlling urban pollutants in stormwater runoff. It also complies with federal requirements and ensures the City’s participation in the National Pollution Discharge Elimination System (NPDES) permits.				
Post-Disaster Recovery/ Reconstruction Code	No	-	-	-
How does this reduce risk from flood-related hazards?				

	Jurisdiction has this?	Citation and Date (code chapter or name of plan, date of enactment or plan adoption)	Authority (local, county, state, federal)	Responsible Person, Department or Agency
Real Estate Disclosure Requirements	No	-	-	-
How does this reduce risk from flood-related hazards?				
Growth Management	No	-	-	-
How does this reduce risk from flood-related hazards?				
Environmental Protection Ordinance(s)	No	-	-	-
How does this reduce risk from flood-related hazards?				
Flood Damage Prevention Ordinance	Yes	San Juan Capistrano Municipal Code Title 8 Building Regulations, Chapter 11 Floodplain Management Regulations, 5/7/2019.	Local	Engineering & Environmental Services Department
How does this reduce risk from flood-related hazards? Chapter 11 establishes regulations for floodplain management to reduce flood risks, ensure public safety, and comply with the National Flood Insurance Program (NFIP) requirements				
Wellhead Protection	No	-	-	-
How does this reduce risk from flood-related hazards?				
Emergency Management Ordinance	Yes	San Juan Capistrano Municipal Code Title 4 Public Safety, Chapter 1 Emergency Preparedness, 1/21/1997.	Local	Community Services Department
How does this reduce risk from flood-related hazards? Chapter 1 outlines the City's comprehensive emergency preparedness program, which coordinates with all departments to prepare for, respond to, and recover from disasters.				
Climate Change Ordinance	No	-	-	-
How does this reduce risk from flood-related hazards?				
Other	No	-	-	-
How does this reduce risk from flood-related hazards?				

	Jurisdiction has this?	Citation and Date (code chapter or name of plan, date of enactment or plan adoption)	Authority (local, county, state, federal)	Responsible Person, Department or Agency
PLANNING DOCUMENTS				
Comprehensive/ Master Plan	Yes	San Juan Capistrano General Plan, May 16, 2023 (Circulation Element)	Local	Planning Division within the Development Services Department

How does this reduce risk from flood-related hazards?
General Plan Land Use Element covers the land use planning for the city. Goal 3: Distribute additional population within the city based on risk factors. Policy 3.1: Confine higher density lands uses to the valley areas outside of the floodplain. Policy 3.2: limit density of development in the hillsides, floodplain, and other high risk areas. Goal 4: Preserve majors areas of open space and natural features. Policy 4.1: Preserve areas of naturals hazards, such as landslide and floodplains, which would jeopardize the public health and safety. Policy 4.2 Implement land and open space rights acquisition program to allow for the long-term preservation of open space resources.

General Plan Safety Element lists the flood hazard for the city and states the city will control development in the floodplain and floodplain fringe through its Floodplain Management Overlay District.
Goals and Policies for flooding: Policy 1.1 Protect the community from flooding hazards by providing and maintaining flood facilities and limiting development within the floodplain. Policy 1.2 Coordinate and cooperate with the Orange County Flood Control District in maintaining and improve sources for storm drain flood control and levee certification program. Policy 1.3 Explore funding sources for storm drain/flood control facility improvement and increased maintenance

General Plan Floodplain Management Element lists the flood hazards in the city and the goals and policies for managing the flood hazard in the city. Goal 1: protect life and property from floodwaters. Goal 2: Preserve and enhance the natural character of the creeks and their floodplains. Goal 3: Preserve and enhance recreational opportunities and amenities provided by the creeks and their floodplains.

General Plan Conservation and Open Space Element focuses on the protection and enhancement of open space and natural resources to ensure a high quality living environment for years to come.

Capital Improvement Plan	Yes	Capital Improvement Plan, 2024-2025 through 2030-2031	Local	Engineering & Environmental Services
How does this reduce risk from flood-related hazards? The CIP outlines and prioritizes the City's infrastructure and facility projects, ensuring efficient allocation of resources to maintain and enhance public services and community well-being.				
Disaster Debris Management Plan	No	-	-	-
How does this reduce risk from flood-related hazards?				
Floodplain Management or Watershed Plan	No	-	-	-
How does this reduce risk from flood-related hazards?				
Stormwater Management Plan	No	-	-	-
How does this reduce risk from flood-related hazards?				

	Jurisdiction has this?	Citation and Date (code chapter or name of plan, date of enactment or plan adoption)	Authority (local, county, state, federal)	Responsible Person, Department or Agency
Open Space Plan	No	-	-	-
How does this reduce risk from flood-related hazards?				
Urban Water Management Plan	No	-	-	-
How does this reduce risk from flood-related hazards?				
Habitat Conservation Plan	No	-	-	-
How does this reduce risk from flood-related hazards?				
Economic Development Plan	No	-	-	-
How does this reduce risk from flood-related hazards?				
Community Wildfire Protection Plan	No	-	-	-
How does this reduce risk from flood-related hazards?				
Transportation Plan	No	-	-	-
How does this reduce risk from flood-related hazards?				
Agriculture Plan	No	-	-	-
How does this reduce risk from flood-related hazards?				
Climate Action/ Resilience/Sustainability Plan	No	-	-	-
How does this reduce risk from flood-related hazards?				
Tourism Plan	No	-	-	-
How does this reduce risk from flood-related hazards?				
Business/ Downtown Development Plan	No	-	-	-
How does this reduce risk from flood-related hazards?				
Other	No	-	-	-
How does this reduce risk from flood-related hazards?				

	Jurisdiction has this?	Citation and Date (code chapter or name of plan, date of enactment or plan adoption)	Authority (local, county, state, federal)	Responsible Person, Department or Agency
RESPONSE/RECOVERY PLANNING				
Emergency Operations Plan	Yes	Emergency Operations Plan (EOP), 2022	Local	Community Services Department
How does this reduce risk from flood-related hazards? This Plan outlines the procedures and responsibilities for responding to and recovering from emergencies, ensuring coordinated and effective actions to protect public safety and minimize damage.				
Continuity of Operations Plan	No	-	-	-
How does this reduce risk from flood-related hazards?				
Substantial Damage Response Plan	No	-	-	-
How does this reduce risk from flood-related hazards?				
Threat and Hazard Identification and Risk Assessment	No	-	-	-
How does this reduce risk from flood-related hazards?				
Post-Disaster Recovery Plan	No	-	-	-
How does this reduce risk from flood-related hazards?				
Other	No	-	-	-
How does this reduce risk from flood-related hazards?				

5.3.2 Development and Permitting Capability

Table 5-3 summarizes the capabilities of the City of San Juan Capistrano to oversee and track development.

Table 5-3. Development and Permitting Capability

	Yes/No	Comment
Do you issue development permits? • **If you issue development permits, what department is responsible?** • **If you do not issue development permits, what is your process for tracking new development?**	Yes	Development Services Department is responsible for issuing development permits in the City of San Juan Capistrano
Are permits tracked by hazard area? (For example, floodplain development permits.)	No	-
Do you have a buildable land inventory? • **If you have a buildable land inventory, please describe**	No	-
Describe the level of buildout in your jurisdiction.	-	The City is almost completely built out, however, there are some areas that are undeveloped.

5.3.3 Administrative and Technical Capability

Table 5-4 summarizes potential staff and personnel resources available to the City of San Juan Capistrano and their current responsibilities that contribute to floodplain management.

Table 5-4. Administrative and Technical Capabilities

Resources	Available?	Comment
ADMINISTRATIVE CAPABILITY		
Planning Board	Yes	Planning Division within the Development Services Department
Zoning Board of Adjustment	No	-
Planning Department	Yes	Planning Division within the Development Services Department
Mitigation Planning Committee	No	-
Environmental Board/Commission	No	-
Open Space Board/Committee	No	-
Economic Development Commission/Committee	No	-
Public Works/Highway Department	Yes	Public Works and Community Services Department
Construction/Building/Code Enforcement Department	Yes	The Building Division within the Development Services Department. The Code Enforcement Division.
Emergency Management/Public Safety Department	No	-
Maintenance programs to reduce risk (stormwater maintenance, tree trimming, etc.)	No	-
Mutual aid agreements	No	-
Human Resources Manual - Do any job descriptions specifically include identifying or implementing mitigation projects or other efforts to reduce natural hazard risk?	No	-
Other	No	-
TECHNICAL/STAFFING CAPABILITY		
Planners or engineers with knowledge of land development and land management practices	Yes	Planning Division within the Development Services Department
Engineers or professionals trained in building or infrastructure construction practices	Yes	The Building Division within the Development Services Department. The Code Enforcement Division.
Planners or engineers with an understanding of natural hazards	No	-
Staff with expertise or training in benefit/cost analysis	No	-
Professionals trained in conducting damage assessments	Yes	Engineering & Environmental Services Department
Personnel skilled or trained in GIS and/or Hazus applications	No	-
Staff that work with socially vulnerable populations or underserved communities	No	-
Public Information Officer	No	-
Surveyors	No	-
Emergency manager	No	-
CRS Coordinator	No	-
Resilience Officer	No	-
Other (this could include stormwater engineer, environmental specialist, etc.)	No	-

5.3.4 Fiscal Capability

Table 5-5 summarizes financial resources available to the City of San Juan Capistrano.

Table 5-5. Fiscal Capabilities

Financial Resources	Accessible or Eligible to Use?
Community Development Block Grants (CDBG, CDBG-DR)	Yes – Eligible
Capital improvement project funding	Yes – Accessible
Authority to levy taxes for specific purposes	Yes – Eligible
User fees for water, sewer, gas, or electric service	Yes – Eligible
Impact fees for homebuyers or developers of new development/homes	Yes – Eligible
Stormwater utility fee	Yes – Eligible
Incur debt through general obligation bonds	Yes – Eligible
Incur debt through special tax bonds	Yes – Eligible
Incur debt through private activity bonds	Yes – Eligible
Withhold public expenditures in hazard-prone areas	Yes – Eligible
Other federal or state funding programs	Yes – Eligible
Open Space Acquisition funding programs	Yes – Eligible
Other (for example, Clean Water Act 319 Grants [Nonpoint Source Pollution])	No

5.3.5 Education and Outreach Capability

Table 5-6 summarizes the education and outreach resources available to the City of San Juan Capistrano.

5.3.6 Community Classifications

Table 5-7 summarizes classifications for community programs available to the City of San Juan Capistrano.

Table 5-6. Education and Outreach Capabilities

Outreach Resources	Available?	Comment
Public information officer or communications office	Yes	City Manager's Office
Personnel skilled or trained in website development	No	-
Floodplain management information available on your website	No	-
Social media for floodplain management education and outreach	No	-
Citizen boards or commissions that address issues related to floodplain management	No	-
Warning systems for hazard events	Yes	AlertOC
Natural disaster/safety programs in place for schools	No	-
Organizations that conduct outreach to socially vulnerable populations and underserved populations	No	-
Public outreach mechanisms / programs to inform citizens on natural hazards, risk, and ways to protect themselves during such events	No	-

Table 5-7. Community Classifications

Program	Participating?	Classification	Date Classified
Community Rating System (CRS)	Yes	Class 7	April 2025
Building Code Effectiveness Grading Schedule (BCEGS)	No	-	-
Public Protection (ISO Fire Protection Classes 1 to 10)	Yes	Class 2	UNK
National Weather Service StormReady Certification	No	-	-
Firewise Communities classification	No	-	-
Other: Organizations with mitigation focus (advocacy group, non-government)	No	-	-

— = Unavailable

5.3.7 Adaptive Capacity

Adaptive capacity is defined as “the ability of systems, institutions, humans and other organisms to adjust to potential damage, to take advantage of opportunities, or respond to consequences” (IPCC 2022). Each jurisdiction has a unique combination of capabilities to adjust to, protect from, and withstand a future hazard event, future conditions, and changing risk. Table 5-8 summarizes the adaptive capacity for each identified hazard of concern and the City’s capability to address related actions using the following classifications:

- Strong: Capacity exists and is in use.
- Moderate: Capacity might exist; but is not used or could use some improvement.
- Weak: Capacity does not exist or could use substantial improvement

Table 5-8. Adaptive Capacity

Hazard	Adaptive Capacity - Strong/Moderate/Weak
Flood	Moderate
Riverine Flood	Moderate
Coastal Flood	Strong
Sea Level Rise	Strong
Tsunami	Strong
Dam Failure	Moderate

5.4 NATIONAL FLOOD INSURANCE PROGRAM COMPLIANCE

This section provides specific information on the management and regulation of the regulatory floodplain, including current and future compliance with the National Flood Insurance Program (NFIP). The floodplain administrator listed in Table 5-1 is responsible for maintaining this information.

5.4.1 NFIP Statistics

Table 5-9 summarizes the NFIP policy and claim statistics for the City of San Juan Capistrano.

Table 5-9. City of San Juan Capistrano NFIP Summary of Policy and Claim Statistics

# Claims (Losses)	2
Total Loss Payments	$25,268.96
# Repetitive Loss Properties (NFIP definition)	1
# Repetitive Loss Properties (FMA definition)	0
# Severe Repetitive Loss Properties (NFIP definition)	0
# Severe Repetitive Loss Properties (FMA definition)	0

NFIP Definition of Repetitive Loss: The NFIP defines a repetitive loss property as any insurable building for which two or more claims of more than $1,000 were paid by the NFIP within any rolling 10-year period since 1978.

FMA Definition of Repetitive Loss: FEMA's Flood Mitigation Assistance (FMA) program defines a repetitive loss property as any insurable building that has incurred flood-related damage on two occasions, in which the cost of the repair, on average, equaled or exceeded 25 percent of the market value of the structure at the time of each such flood event.

Definition of Severe Repetitive Loss: A residential property covered under an NFIP flood insurance policy and: (a) That has at least four NFIP claim payments over $5,000 each, and the cumulative amount of such claims payments exceeds $20,000; or (b) For which at least two separate claims payments have been made with the cumulative amount of the building portion of such claims exceeding the market value of the building. At least two of the claims must have occurred within any 10-year period, more than 10 days apart.

Source: FEMA, 2024.

5.4.2 Flood Vulnerability Summary

Table 5-10 provides a summary of the NFIP program in City of San Juan Capistrano.

Table 5-10. NFIP Summary

NFIP Topic	Comments
Flood Vulnerability Summary	
Describe areas prone to flooding in your jurisdiction.	Only repetitive loss properties.
Do you maintain a list of properties that have been damaged by flooding?	Yes, a list is tracked and submitted for CRS credit annually. The City works responsively with any property owner that has interest in flood mitigation. Most if not all inquiries are only interested in flood mapping to save on insurance premiums.
Do you maintain a list of property owners interested in flood mitigation?	No, not at this time.
How many homeowners and/or business owners are interested in mitigation (elevation or acquisition)?	Unknown, at this time.
Are any RiskMAP projects currently underway in your jurisdiction? If so, state what projects are underway.	None, at this time.
How do you make Substantial Damage determinations?	Based on a valuation of the project submitted by a licensed contractor.
How many Substantial Damage determinations were declared for recent flood events in your jurisdiction?	No substantial damages due to floods were recently declared.
How many properties have been mitigated (elevation or acquisition) in your jurisdiction? If there are mitigation properties, how were the projects funded?	None, at this time.

NFIP Topic	Comments
Do your flood hazard maps adequately address the flood risk within your jurisdiction? If not, state why.	There are multiple areas within the city that have inaccurate flood zone delineations due to outdated mapping based on inaccurate topography. FEMA has been made aware of this and stated they would inquire about a city-wide map revision.
NFIP Compliance	
What local department is responsible for floodplain management?	Department of Engineering & Environmental Services
Are any certified floodplain managers on staff in your jurisdiction?	Currently the city has one contract staff that is a certified floodplain manager.
Do you have access to resources to determine possible future flooding conditions from climate change?	Unknown, at this time.
Does your floodplain management staff need any assistance or training to support its floodplain management program? If so, what type of assistance/training is needed?	Yes, our floodplain management staff would benefit from additional training to effectively support the floodplain management program. As we currently have limited experience in this area, foundational training on floodplain regulations, FEMA's National Flood Insurance Program (NFIP), floodplain mapping, permitting requirements, and best practices in flood risk reduction would be especially valuable. Assistance with understanding compliance requirements, conducting floodplain analyses, and integrating floodplain considerations into development review processes would also be helpful. We are open to participating in workshops, webinars, or technical assistance programs that can build our understanding in these areas.
Provide an explanation of NFIP administration services you provide (e.g., permit review, GIS, education/outreach, inspections, engineering capability)	The City provides permit review, GIS mapping, education/outreach, inspections, engineering capability, and community support/education.
How do you determine if proposed development on an existing structure would qualify as a substantial improvement?	Based on improvements that would be valued at 50% or more of the existing structure. Historically proposed improvements have been significantly less or more of an existing structure and this analysis has not been needed. In most cases engineering judgment is used. In the event an analysis is needed the city requires a valuation for comparison purposes.
What are the barriers to running an effective NFIP program in the community, if any?	Financial resources for staffing and/or consulting support.
Does your jurisdiction have any outstanding NFIP compliance violations that need to be addressed? If so, state the violations.	None, at this time.
When was the most recent Community Assistance Visit (CAV) or Community Assistance Contact (CAC)?	2022
What is the local law number or municipal code of your flood damage prevention ordinance?	Code of Ordinances, Title 8 – Building Regulations, Chapter 8-11 – Floodplain Management Regulations
What is the date that your flood damage prevention ordinance was last amended?	April 2023
Does your floodplain management program meet or exceed minimum requirements? If exceeds, in what ways?	Meets minimum requirements.

NFIP Topic	Comments
Are there other local ordinances, plans or programs (e.g., site plan review) that support floodplain management and meeting the NFIP requirements? For instance, does the planning board or zoning board consider efforts to reduce flood risk when reviewing variances such as height restrictions?	Code of Ordnances, Title 9 – Land use, Chapter 9-3 – Environmental Overlay Districts, Section 9-3.405
Does your community plan to join the CRS program or is your community interested in improving your CRS classification?	The community is currently in the CRS program. At this time resources are limited and increasing the classification has not been determined.

5.5 GROWTH/DEVELOPMENT TRENDS

Understanding how past, current, and projected development patterns have or are likely to increase or decrease risk in hazard areas is a key component to appreciating a jurisdiction's overall risk to its hazards of concern. Recent and expected future development trends, including major residential/commercial development and major infrastructure development, are summarized in Table 5-11 through Table 5-13.

Table 5-11. Number of Building Permits for New Construction Issued Since 2020

	New Construction Permits Issued			
	Single Family	Multi-Family	Other (commercial, mixed-use, etc.)	Total
2020				
Total Permits	12	0	5	17
Permits within SFHA	0	0	0	0
2021				
Total Permits	0	0	2	2
Permits within SFHA	0	0	0	0
2022				
Total Permits	81	1	14	96
Permits within SFHA	0	0	0	0
2023				
Total Permits	189	1	16	206
Permits within SFHA	0	0	0	0
2024				
Total Permits	42	1	16	59
Permits within SFHA	0	0	0	0

SFHA = Special Flood Hazard Area (1% flood event)
"Other" includes Mobile Home installations and alternative dwelling units

Table 5-12. Recent Major Development and Infrastructure from 2020 to Present

Property or Development Name	Type of Development	# of Units / Structures	Location (address and/or block and lot)	Known Hazard Zones*	Description / Status of Development
The River Street Project	Commercial	59,067 sq. ft. commercial	31825 Los Rios St	Previously AE, removed out of flood zone with project LOMR.	Completed
The Farm on Del Obispo	Residential	169 homes	32382 Del Obispo	N/A	Completed
Petra Avelina	Residential	89 Townhomes, 43 single family residences	Terminus of Calle Arroyo	AE	Completed
In-N-Out	Commercial	1 restaurant structure (3,879 SF)	31791 Del Obispo St	N/A	Completed
City Hall & Permanent Supportive Housing	Office, Residential	50 Multi-Family units; 16,021 sq. ft. Municipal Office	32400 Paseo Adelanto	Previously AE, removed out of flood zone with project LOMR.	Completed

* Only location-specific hazard zones or vulnerabilities identified.

Table 5-13. Known or Anticipated Major Development and Infrastructure in the Next Five Years

Property or Development Name	Type of Development	# of Units / Structures	Location (address and/or block and lot)	Known Hazard Zones*	Description / Status of Development
Distrito La Novia-San Juan Meadows	Residential, Commercial	75,000 sq. ft. retail; 16,000 sq. ft. office; 130 multi-family units; 94 single-family units; 500 horse equestrian center	North and south sides of La Novia Avenue, east of Valle Road.	N/A	Rough Grading underway
Swallows Creek	Industrial	122,308 sq. ft. of Industrial; 14,000 sq. ft. automobile showroom	30700 Rancho Viejo Road	N/A	Under Construction
Saint Margaret's Episcopal Student Commons	P&I	35,400 SF student commons building	31732 Rancho Viejo Rd	N/A	Under Construction
San Juan Plaza	Mixed-Use	278 apartment units	32211, 32221, 32231, 32241, 32261, 32281 Camino Capistrano	N/A	Entitled
Distrito La Novia-San Juan Meadows	Residential, Commercial	75,000 sq. ft. retail; 16,000 sq. ft. office; 130 multi-family units; 94 single-family units; 500	North and south sides of La Novia Avenue, east of Valle Road.	N/A	Rough Grading underway

Property or Development Name	Type of Development	# of Units / Structures	Location (address and/or block and lot)	Known Hazard Zones*	Description / Status of Development
		horse equestrian center			
Camino Twelve	Residential	12 townhomes	25642 Camino Del Avion	N/A	Entitled
El Camino Specific Plan	Mixed Use	27,457 sq. ft. mixed-use project with 216 parking spaces	26874 Old Mission Road	N/A	Entitled
St. John Church	Other	21,358 sq. ft. Church Campus	29582 Trabuco Creek Rd	AE	Under Review
Camino Capistrano Hotel	Commercial	81-room Hotel	31861 Camino Capistrano	N/A	Under Review
Juliana Farms Lot 13 Subdivision	Residential	6 single family dwellings	31495 Juliana Farms Road	N/A	Under Review
Performing Arts Center	Commercial	48,235 sq. ft. Performing Arts Center	31872 El Camino Real	N/A	Under Review
Forster Mixed Use Project	Mixed Use	Mixed use project, with 95 apartment units with a 3,271 sq. ft. clubhouse; 3,895 sq. ft. restaurant; 3,100 sq. ft. fitness center	31878 El Camino Real	N/A	Under Review
Chipotle	Commercial	1 restaurant structure	31787 Del Obispo St	N/A	Under Review

5.6 JURISDICTIONAL RISK ASSESSMENT

The hazard profiles in Volume I provide detailed information regarding each planning partner's vulnerability to the identified hazards, including summaries of the City of San Juan Capistrano's risk assessment results and data used to determine the hazard ranking. Key local risk assessment information is presented below.

5.6.1 Hazard Area

Maps of hazard areas in the City are shown in Figure 5-1 and Figure 5-2. These maps are based on the best available data at the time of the preparation of this plan and are adequate for planning purposes. Maps are provided only for hazards that can be identified clearly using mapping techniques and technologies and for which Orange County has significant exposure. The maps show the location of potential new development, where available.

Figure 5-1. City of San Juan Capistrano Dam Inundation and FEMA Flood Hazard Area Extent and Location Map

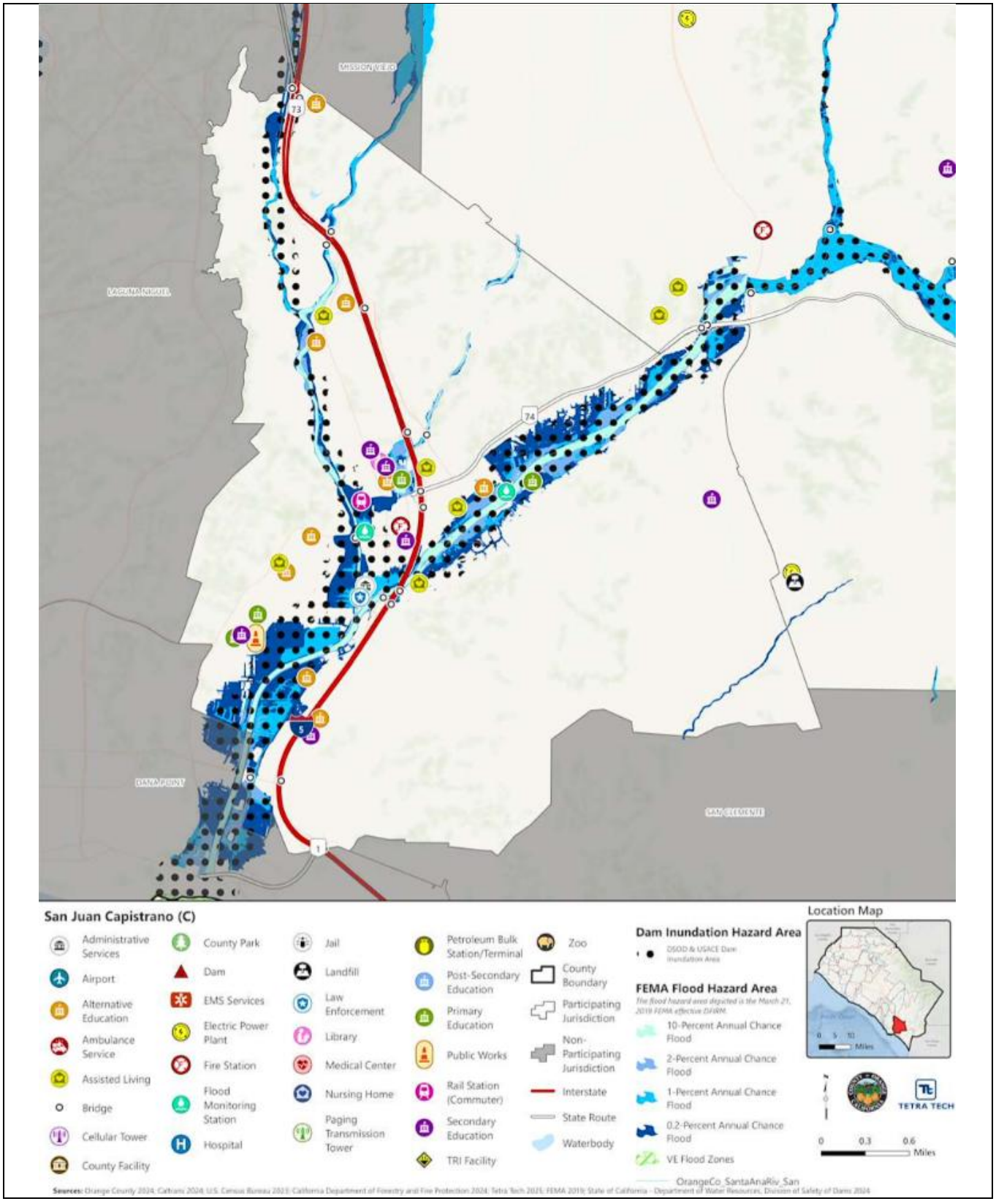
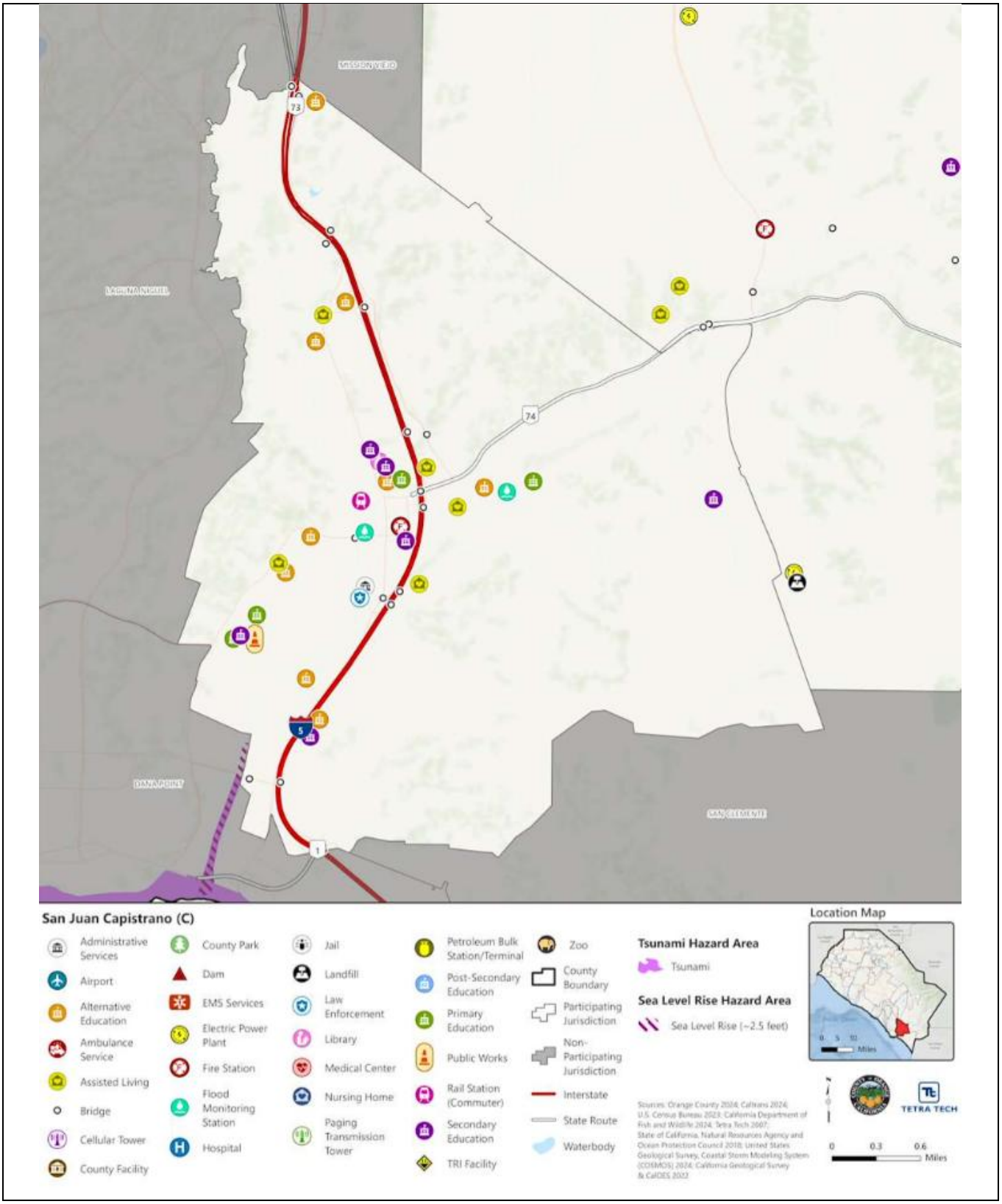


Figure 5-2. City of San Juan Capistrano Tsunami and Sea Level Rise Hazard Area Extent and Location Map



5.6.2 Hazard Event History

The history of natural and non-natural hazard events in Orange County is detailed in Volume I, where each hazard profile includes a chronology of historical events that have affected the County and its municipalities. Table 5-14 provides details on loss and damage in the City of San Juan Capistrano during hazard events since 2020.

Table 5-14. Hazard Event History in City of San Juan Capistrano

Dates of Event	Event Type (Disaster Declaration)	Summary of Event	Summary of Damage and Losses in San Juan Capistrano
September 16, 2015	-	An 8.3 magnitude earthquake off Chile's coast on the 16th prompted a tsunami advisory from Orange County to north of San Luis Obispo. Beaches, harbors, piers, and marinas in several cities, including Seal Beach and Huntington Beach, were closed through the 17th. Tsunami waves under one foot were observed along the Orange County coast. The Orange County EOC reported no significant flooding but warned of strong currents and dangerous waves.	No impacts were recorded by the City.
January 18, 2017 – January 23, 2017	DR-4305-CA	Severe winter storm, mudslides, and flooding occurred throughout the region. Water damage and disruptions were seen in the County.	No impacts were recorded by the City.
January 22, 2017	-	Heavy rain caused flash flooding across Orange County, resulting in $100,000 in property damages. A water rescue took place on Hamilton Ave. at the Santa Ana River in Huntington Beach. Streets from Sunset Beach to Santa Ana to Newport Beach were flooded with 1-3 feet of water. Many vehicles were stranded in floodwaters, including several along Highway 55.	No impacts were recorded by the City.
February 17, 2017	-	Flood waters from the East Garden Grove-Wintersburg Channel overflowed, causing $50,000 in property damages and flooding a mobile home park.	No impacts were recorded by the City.
May 24, 2017	-	High tides of 6.5 feet caused minor street flooding and $10,000 in property damages on Balboa Island, with some water entering houses near 36th and Finley Streets. The flooding was exacerbated by the recent demolition of a protective sea wall.	No impacts were recorded by the City.
October 7, 2017	-	Lifeguards reported 6-8 ft surf on the 7th and 8th in Newport and Huntington Beach, with peak waves of 15 ft at the Wedge. Coastal flooding during high tide on the Balboa Peninsula in Newport Beach caused $25,000 in property damages. The beach parking lot, nearby streets, and homes were flooded, and several cars were swamped. In Capistrano Beach, large waves shattered a window in a home.	No impacts were recorded by the City.
February 13, 2019	-	Flash flooding occurred in Laguna Beach with up to 2 inches of rain in 3 hours inundated storm channels, causing $80,000 in property damages. Streets were closed, and homes were threatened by the rising waters.	No impacts were recorded by the City.
April 6, 2020	-	Heavy rainfall occurred in San Juan Capistrano which resulted in one inch of rain in just 20 minutes. In Silverado Canyon, 0.88 of rain was reported in 1 hour from two rain gauges.	No impacts were recorded by the City.

Dates of Event	Event Type (Disaster Declaration)	Summary of Event	Summary of Damage and Losses in San Juan Capistrano
July 3, 2020	-	High tide near 6.8 feet and high surf caused minor coastal flooding in Newport Beach, resulting in $40,000 in property damages. Flooding extended up to three blocks inland, and a sailboat was washed ashore and destroyed.	No impacts were recorded by the City.
March 10, 2021	-	Mud and debris flows from the Bond Fire caused $75,000 in property damages, damaging 8 vehicles and 6 homes. Swift water rescues were performed around 6 to 7 am. Mud covered at least 3 locations on Silverado Canyon Road and at Silverado Cafe, with rainfall rates reaching 0.20 inches in 15 minutes.	No impacts were recorded by the City.
December 14, 2021	-	Debris flows from the Bond Fire scar and Silverado Canyon caused $800,000 in property damages. Santiago Creek Road was blocked by high water and mud, while Jackson Creek Road was flooded with mud and debris. Rainfall rates reached up to 1.2 inches at Irvine Lake and Santiago Canyon.	No impacts were recorded by the City.
January 15, 2022	-	A Tsunami Advisory was issued at 5:03 AM for the Orange County Coast. Wireless Emergency Alerts and sirens were activated. The first wave arrived around 8 AM, causing coastal damage, including a drifting buoy off Huntington Bay.	No impacts were recorded by the City.
January 8, 2023 – January 31, 2023	EM-3591-CA	EM-3591-CA was an emergency declaration for California due to severe winter storms, flooding, and mudslides from January 8 to January 31, 2023. Issued on January 9, 2023, it provided federal assistance to support state, local, and tribal response efforts.	No impacts were recorded by the City.
February 21, 2023 – March 24, 2023	Unknown	There was a storm event that caused minor trail damage due to rain, runoff, and erosion. The impacts included small sinkholes, downed trees, and mud and debris scattered across the trails. The associated repair costs are considered minor.	No impacts were recorded by the City.
March 1, 2023	-	Caltrans issued a Sig Alert for flooding at the I-5 and Highway 55 transition, causing $10,000 in property damages. Approximately 0.8 inches of rain fell in the area.	No impacts were recorded by the City.
March 9, 2023 – July 20, 2023	EM-3592-CA	Local media reported coastal flooding up to 18 inches deep near Seal Beach Pier due to high tide and surf. At least one car was swamped, but no damage to homes or businesses was confirmed.	No impacts were recorded by the City.

EM = Emergency Declaration (FEMA); FEMA = Federal Emergency Management Agency; DR = Major Disaster Declaration (FEMA); N/A = Not applicable
Source: NWS, 2024; FEMA, 2024

5.6.3 Hazard Ranking and Vulnerabilities

The hazard profiles in Volume I have detailed information regarding each planning partner's vulnerability to the identified hazards. The following presents key risk assessment results for the City of San Juan Capistrano.

Hazard Ranking

The participating jurisdictions have differing degrees of vulnerability to the hazards of concern, so each jurisdiction ranked its own degree of risk to each hazard. The community-specific hazard ranking is based on problems and impacts identified by the risk assessment presented in Volume I. The ranking process involves an assessment of the likelihood of occurrence for each hazard; the potential impacts of the hazard on people, property, and the economy; community capabilities to address the hazard; and changing future climate conditions.

Table 5-15 shows the City of San Juan Capistrano's final hazard rankings for identified hazards of concern. Mitigation action development uses the ranking to target hazards with the highest risk. Hazards with a risk ranking of "low," such as Flood, Coastal Flood, Sea Level Rise, and Tsunami may not present the most risk but remain a concern and mitigation action priority for the County and City of San Juan Capistrano. Stakeholder feedback indicates although Flood risk ranking is low, Orange County communities are still focused on addressing mitigation projects related to the hazard. In addition, hazards ranked as "high" does not necessarily indicate a surety of the hazard occurring rather this ranking suggests that if an event were to occur the potential impacts on the people, property, and economy would be very significant. The risk associated with "high" ranking are categorized as low-probability and high-consequence events.

Table 5-15. Hazard Ranking

Hazard	Rank
Flood	Low
Riverine Flood	Medium
Coastal Flood	Low
Sea Level Rise	Low
Tsunami	Low
Dam Failure	Medium

Note: The scale is based on the hazard rankings established in Volume I, modified as appropriate based on review by the jurisdiction

Critical Facilities

Table 5-16 identifies those critical facilities in the community that are located in the 1 percent and 0.2 percent annual chance event floodplains – i.e., Special Flood Hazard Areas (SFHA).

Table 5-16. Critical Facility Exposure to the Special Flood Hazard Area (SFHA)

Name	Type	SFHA Exposure	
		1% Annual Chance Event	0.2% Annual Chance Event
City Hall - City of San Juan Capistrano	Administrative Services	Y	Y
California Preparatory Academy	Alternative Education	N	Y
Capistrano Home/Virtual	Alternative Education	N	N
Capistrano Valley Christian Schools	Alternative Education	N	N
HEART Christian Preparatory Academy	Alternative Education	N	N
JSerra Catholic High School	Alternative Education	N	N
Mission Basilica School	Alternative Education	N	N
Saddelback Valley Christian Schools PSSP	Alternative Education	N	N
St. Margaret's Episcopal School	Alternative Education	Y	Y

Name	Type	SFHA Exposure	
		1% Annual Chance Event	0.2% Annual Chance Event
Stoneybrooke Christian Schools	Alternative Education	N	N
ATRIA SAN JUAN	Assisted Living	N	N
CAPISTRANO SENIOR LIVING	Assisted Living	N	N
DEL OBISPO TERRACE SENIOR LIVING	Assisted Living	N	N
SERRA SOL	Assisted Living	N	N
SILVERADO SENIOR LIVING - SAN JUAN CAPIS	Assisted Living	N	N
HORNO CREEK CHANNEL - Bridge	Bridge	N	N
INTERSTATE 5 - Bridge	Bridge	N	N
INTERSTATE 5 - Bridge	Bridge	N	N
INTERSTATE 5 - Bridge	Bridge	N	N
INTERSTATE 5 - Bridge	Bridge	N	N
INTERSTATE 5 - Bridge	Bridge	N	N
INTERSTATE 5 - Bridge	Bridge	N	N
INTERSTATE 5 - Bridge	Bridge	N	N
INTERSTATE 5 - Bridge	Bridge	N	N
N5-N73 CONNECTOR - Bridge	Bridge	N	N
ROUTE 74 - Bridge	Bridge	N	N
S1-N5 CONNECTOR - Bridge	Bridge	N	N
S73-S5 CONNECTOR - Bridge	Bridge	N	N
SAN JUAN CREEK CHANNEL - Bridge	Bridge	N	Y
SAN JUAN CREEK CHANNEL - Bridge	Bridge	Y	Y
STONEHILL DRIVE OH - Bridge	Bridge	N	N
TRABUCO CREEK CHANNEL - Bridge	Bridge	N	N
TRABUCO CREEK CHANNEL - Bridge	Bridge	N	Y
TRABUCO CREEK CHANNEL - Bridge	Bridge	N	Y
Orange County Fire Authority - Station 7	Fire Station	N	N
San Juan Creek Watershed - Arroyo Trabuco Creek Hydstra Flood Station	Flood Monitoring Station	N	N
San Juan Creek Watershed - San Juan Creek Hydstra Flood Station	Flood Monitoring Station	N	Y
San Juan Capistrano Police Services	Law Enforcement	N	N
San Juan Capistrano Library	Library	N	N
Del Obispo Elementary	Primary Education	N	N
Harold Ambuehl Elementary	Primary Education	N	Y
Kinoshita Elementary	Primary Education	N	N
San Juan Elementary	Primary Education	Y	Y
Public Works - City of San Juan Capistrano	Public Works	N	N
SAN JUAN CAPISTRANO	Rail Station (Commuter)	N	Y
California Connections Academy Southern California	Secondary Education	N	N
Capistrano Union High	Secondary Education	N	N

Name	Type	SFHA Exposure	
		1% Annual Chance Event	0.2% Annual Chance Event
Marco Forster Middle	Secondary Education	N	N
OCASA College Prep	Secondary Education	Y	Y
Opportunities for Learning - Capistrano	Secondary Education	N	N
San Juan Hills High	Secondary Education	N	N

Source: California Department of Education 2024; Caltrans 2024; HIFLD 2022, 2023, 2024; Orange County 2022, Orange County Sheriff's Department 2024; U.S. Geological Survey 2024; USACE 2024
Note: N = Facility is NOT exposed to the SFHA Zone (1% / 0.2%); Y = Facility IS exposed to the SFHA Zone (1% / 0.2%).

Dam Hazard Vulnerability

The U.S. Army Corps of Engineers (USACE) operates and maintains approximately 740 dams across the United States, providing benefits such as flood risk management, water supply, hydropower, and environmental stewardship (USACE 2021). USACE classifies its dams into five Dam Safety Action Classes (DSAC), ranging from DSAC I (highest risk) to DSAC V (lowest risk), based on factors like event probability, probability of failure, and potential consequences (USACE 2010). This risk-informed approach ensures that dam safety decisions prioritize life safety and effective resource allocation (USACE 2021). There are no people located in the City of San Juan Capistrano which are located in the USACE Dam inundation area.

The California Division of Safety of Dams (DSOD) oversees the design, construction, and maintenance of over 1,200 jurisdictional-sized dams in California (CA DWR 2025). Established in 1929, DSOD ensures dam safety by conducting annual inspections, reviewing structural and hydrological analyses, and approving modifications to existing dams. Dams are classified based on their downstream hazard potential, which ranges from high to low, reflecting the potential impact on life and property in the event of a failure (CA Office of Emergency Services GIS 2020). This classification system helps prioritize safety measures and resource allocation to protect communities and infrastructure. Refer to Table 5-17 for the CA DSOD dams located in the City of San Juan Capistrano.

Table 5-17. CA DSOD Dams and Population in Dam Inundation Area for City of San Juan Capistrano

Dam Name	Total Population (2020 Decennial)	Estimated Number of People Located in Dam Inundation Area	Estimated Percent Total of People Located in Dam Inundation Area
Big Canyon Dam	35,196	0	0.0%
Diemer Dam	35,196	0	0.0%
Deimer No.8 Dam	35,196	0	0.0%
Deimer Ozone Dam	35,196	0	0.0%
Dove Canyon Dam	35,196	0	0.0%
Harbor View Dam	35,196	0	0.0%
Lake Mission Viejo Dam	35,196	1,739	4.9%
Lower Peters Canyon Dam	35,196	0	0.0%
Peters Canyon Dam	35,196	0	0.0%
Portola Dam	35,196	0	0.0%
Rattlesnake Dam	35,196	0	0.0%
Rossmoor Dam	35,196	0	0.0%
San Joaquin Dam	35,196	0	0.0%

Dam Name	Total Population (2020 Decennial)	Estimated Number of People Located in Dam Inundation Area	Estimated Percent Total of People Located in Dam Inundation Area
Sand Canyon	35,196	0	0.0%
Santiago Dam	35,196	0	0.0%
Sulphur Creek Dam	35,196	0	0.0%
Syphon Dam	35,196	0	0.0%
Trampas Dam	35,196	5,070	14.4%
Upper Chiquita Dam	35,196	0	0.0%
Upper Oso Dam	35,196	3,157	9.0%
Villa Park Dam	35,196	0	0.0%
Walnut Dam	35,196	0	0.0%
Yorba Dam	35,196	0	0.0%

Source: U.S. Census Bureau 2020; State of California - Department of Water Resources, Division of Safety of Dams 2024

5.6.4 Identified Issues

After review of the City of San Juan Capistrano's hazard event history, hazard rankings, hazard location, and current capabilities, the City identified the following vulnerabilities within the community:

- There is limited City staff expertise in floodplain management and CRS participation.
- The public awareness of flood risks is low, especially outside mapped flood zones in the City.
- The City has funding constraints and complex permitting processes that delay obtaining funding for mitigation projects. Additionally, there are geographic constraints which limit options for traditional flood control infrastructure.
- The City has limited local data and modeling on sea level rise impacts. There is uncertainty around long-term sea level rise projections which complicates planning efforts.
- Coastal flooding is not fully integrated into all planning and emergency preparedness efforts. Regulatory and environmental constraints limit shoreline modification options.
- The City experiences funding limitations for large-scale channels and storm drain upgrades. There are also environmental permit challenges for creek improvements.
- There is limited in-house technical expertise for advanced hydrologic and hydraulic analysis.
- The City has a limited local focus on tsunami risk due to the inland location. However, public awareness of tsunami hazards is still low in nearby coastal areas as well.
- The City lacks detailed tsunami evacuation infrastructure in adjacent coastal communities. The City also has trouble in securing funding for mitigation measures in non-coastal areas.
- The City is experiencing aging infrastructure and potential gaps in the current dam safety and emergency response plans.
- The City lacks a comprehensive regional planning for sea level rise impacts on infrastructure and ecosystems.
- The City does not have a Storm Drain Master Plan and therefor does not have data to explain the areas that most frequently flood and why.
- The City does not have a warning system in place to alert residents of a flood event due to riverine flood.

5.7 MITIGATION STRATEGY AND PRIORITIZATION

The City of San Juan Capistrano participated in the mitigation strategy workshop for this FMP to identify appropriate actions to include in a mitigation action catalogue. Its comprehensive consideration of all possible activities to address flood-related hazards of concern included review of the six CRS action categories:

- **Property Protection (PP)** -These actions include public activities to reduce hazard losses or actions that involve (1) modification of existing buildings or structures to protect them from a flood hazard or (2) removal of structures from the flood hazard area.
- **Preventative Measures (PR)** - Government, administrative, or regulatory actions, or processes that influence the way land and buildings are developed and built. Examples include planning and zoning, capital improvement plans, etc.
- **Public Information (PI)** - Actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them.
- **Natural Resource Protection (NPR)** - Actions that minimize flood hazard loss and preserve or restore the functions of natural systems.
- **Structural Flood Control Project (SP)** - Actions that involve the construction of structures to reduce the impact of a flood hazard. Such structures include dams, setback levees, floodwalls, retaining walls, and safe rooms.
- **Emergency Services (ES)** - Actions that protect people and property during and immediately following a disaster or flood related hazard event. Services include warning systems, emergency response services, and the protection of essential facilities.

The action worksheets included at the end of this annex list the mitigation actions that the City of San Juan Capistrano would like to pursue in the future to reduce the effects of flood-related hazards. The actions are dependent upon available funding (grants and local match availability) and may be modified or omitted at any time based on the occurrence of new flood-related hazard events and changes in City priorities. Action summary information is provided in Table 5-18.

Volume I identifies 14 evaluation criteria for prioritizing the mitigation actions. To assist with rating each mitigation action as high, medium, or low priority, a numeric rank is assigned (-1, 0, or 1) for each of the evaluation criteria. Table 5-19 provides a summary of the prioritization of all proposed mitigation actions for the FMP.

Table 5-18. Mitigation Action Summary

Project Number	Project Name	Flood Hazard	Responsible Party	Brief Summary of the Problem and the Solution (Project)	CRS Category
2025-SanJuanCapistrano-FMP1	CRS FEMA Training	Flood, Riverine Flood, Coastal Flood, Sea Level Rise, Dam Failure, Tsunami	City Engineering and Environmental Services	There is limited City staff expertise in floodplain management and CRS participation. The City staff will attend virtual trainings and review available resources from FEMA and ASFPM at the ASFPM (https://www.floods.org/) website.	PI
2025-SanJuanCapistrano-FMP2	Public Floodplain Outreach	Flood, Coastal Flood, Riverine Flood, Tsunami, Dam Failure, Sea Level Rise	City Engineering and Environmental Services	The public awareness of flood risks is low, especially outside mapped flood zones in the City. Develop educational and outreach material to issue to residents on the City floodplain for distribution on a social media platform. This will include information on the flood zone, and what to do before, during, and after a flood. The City will send out a newsletter on a quarterly (four times a year) basis. The City provides updates regarding any potential hazards and how to address flooding issues in neighborhoods. The City gives updates on any current information to better assist the community.	PI, ES
2025-SanJuanCapistrano-FMP3	Grant Funding Opportunity Summary	Flood, Coastal Flood, Riverine Flood, Sea Level Rise, Dam Failure, Tsunami	City Engineering and Environmental Services	The City has funding constraints and complex permitting processes that delay obtaining funding for mitigation projects. Additionally, there are geographic constraints which limit options for traditional flood control infrastructure. The City will explore potential federal and state funding opportunities for mitigation projects and develop an in-house summary of potential funding sources for the City. Additionally, the City will attend grant informational webinars located on the FEMA website: Webinars and Events About Preparedness Grants | FEMA.gov.	PI
2025-SanJuanCapistrano-FMP4	Sea Level Rise Data and Modeling	Flood, Sea Level Rise, Coastal Flood	City Engineering and Environmental Services	The City has limited local data and modeling on sea level rise impacts. There is uncertainty around long-term sea level rise projections which complicates planning efforts. The City will work to incorporate the NOAA Sea Level Rise Viewer data into local City planning efforts. Additionally, the City will link to the NOAA Sea Level Rise Viewer on the City webpage for public access. Sea Level Rise and Coastal Flooding Impacts	PI, PR
2025-SanJuanCapistrano-FMP5	Incorporate Coastal Flood into Planning	Flood, Coastal Flood	City Engineering and	Coastal flooding is not fully integrated into all planning and emergency preparedness efforts. Regulatory and environmental constraints limit shoreline modification options.	PR, PI

Project Number	Project Name	Flood Hazard	Responsible Party	Brief Summary of the Problem and the Solution (Project)	CRS Category
			Environmental Services	During future updates of the Master Plan, Floodplain Management Plan, or the Emergency Operation Plan, the City will work to integrate coastal flooding mitigation principles and recommendations into the plans. Additionally, the City will use these coastal flood hazard mitigation principles and plan recommendations to update local building and zoning codes to create a more resilient community. The City will also use available tools and resources from FEMA and other sources to integrate climate adaptation planning such as FEMA's "Climate Adaptation Planning: Guidance for Emergency Managers" document.	
2025-SanJuanCapistrano-FMP6	State Grant Manager Coordination	Flood, Riverine Flood	City Engineering and Environmental Services; State grant manager	The City experiences funding limitations for large-scale channels and storm drain upgrades. There are also environmental permit challenges for creek improvements. The City grant manager will coordinate with Sate grant manager to include large-scale channel and storm drain upgrades to state funding plans.	PI, SP
2025-SanJuanCapistrano-FMP7	USACE H&H Modeling Training	Flood, Riverine Flood	City Engineering and Environmental Services	There is limited in-house technical expertise for advanced hydrologic and hydraulic analysis. The City Engineer or Engineering Department will send staff to the USACE H&H modelling training. These H&H courses are held virtually: Hydrology / Hydraulics Training	PI, ES
2025-SanJuanCapistrano-FMP8	Tsunami Ready: Public Outreach	Tsunami	City Engineering and Environmental Services	The City has a limited local focus on tsunami risk due to the inland location. However, public awareness of tsunami hazards is still low in nearby coastal areas as well. The City will conduct public outreach to all residents by providing National Weather Service safety flyers on both the City website and at the City Hall. tsunami_safety_rules_20130912.pdf tsunami_preparedness_20130912.pdf	PI, ES
2025-SanJuanCapistrano-FMP9	Tsunami Evacuation Routes and Evacuation Plan	Flood, Tsunami	City Engineering and Environmental Services	The City lacks detailed tsunami evacuation infrastructure in adjacent coastal communities. The City also has trouble in securing funding for mitigation measures in non-coastal areas. The City will create and install Tsunami evacuation signs along evacuation roadways to assist the public with knowing where to evacuate during this hazard event. The City will also create a Tsunami Evacuation Plan which will also explore potential funding	ES, PI

Project Number	Project Name	Flood Hazard	Responsible Party	Brief Summary of the Problem and the Solution (Project)	CRS Category
				opportunities for inland mitigation projects to address tsunami concerns.	
2025-SanJuanCapistrano-FMP10	Update Emergency Response Plan	Flood, Dam Failure	City Engineering and Environmental Services	The City is experiencing aging infrastructure and potential gaps in the current dam safety and emergency response plans. The City will update the Emergency Response Plan, especially the Dam Safety portion of the plan to address dam failure protocol.	PI, ES
2025-SanJuanCapistrano-FMP11	Regional Watershed Agency Coordination	Flood, Sea Level Rise, Coastal Flood	City Engineering and Environmental Services	The City lacks a comprehensive regional planning for sea level rise impacts on infrastructure and ecosystems. The City will coordinate with regional agencies nearby the watershed to enhance the general disaster coordination, already in place, to also include coastal flooding hazards.	PI, ES, PR
2025-SanJuanCapistrano-FMP12	Storm Drain Master Plan	Flood, Sea Level Rise, Coastal Flood, Riverine Flood, Tsunami, Dam Failure	City Engineering and Environmental Services	The City does not have a Storm Drain Master Plan and therefor does not have data to explain the areas that most frequently flood and why. The City will develop a Storm Drain Master Plan to remap the boundaries and better understand areas that flood. The RFP has already been completed and next steps are underway.	PI, SP
2025-SanJuanCapistrano-FMP13	Emergency Warning System	Flood, Riverine Flood	City Engineering and Environmental Services	The City does not have a warning system in place to alert residents of a flood event due to riverine flood. The City will coordinate with the County to add riverine flood alerts to the AlertOC system which is utilized for other hazard events within the City and County limits.	PI, ES

Table 5-19. Summary of Prioritization of Actions

Project Number	Project Name	Scores for Evaluation Criteria															High / Medium / Low
		Life Safety	Property Protection	Cost-Effectiveness	Political	Legal	Fiscal	Environmental	Social Vulnerability	Administrative	Hazards of Concern	Climate Change	Timeline	Community Lifelines	Other Local Objectives	Total	
2025-SanJuanCapistrano-FMP1	CRS FEMA Training	1	1	1	1	1	0	1	1	1	1	1	1	1	1	13	High
2025-SanJuanCapistrano-FMP2	Public Floodplain Outreach	1	1	1	1	1	1	0	1	1	1	1	1	1	1	13	High
2025-SanJuanCapistrano-FMP3	Grant Funding Opportunity Summary	1	1	1	1	1	1	0	1	1	1	1	1	1	1	13	High
2025-SanJuanCapistrano-FMP4	Sea Level Rise Data and Modeling	1	1	1	1	1	0	1	1	0	1	1	0	1	0	10	Medium
2025-SanJuanCapistrano-FMP5	Incorporate Coastal Flood into Planning	1	1	0	1	0	0	0	1	0	1	1	0	0	0	6	Low
2025-SanJuanCapistrano-FMP6	State Grant Manager Coordination	1	1	0	1	0	0	0	1	0	1	1	0	0	0	6	Low
2025-SanJuanCapistrano-FMP7	USACE H&H Modeling Training	1	1	1	1	1	0	0	1	1	1	1	0	1	0	10	Medium
2025-SanJuanCapistrano-FMP8	Tsunami Ready: Public Outreach	1	1	0	1	0	0	0	1	0	1	1	0	0	0	6	Low
2025-SanJuanCapistrano-FMP9	Tsunami Evacuation Routes and Evacuation Plan	1	1	0	1	0	0	0	1	0	1	1	0	0	0	6	Low

Project Number	Project Name	Scores for Evaluation Criteria															High / Medium / Low
		Life Safety	Property Protection	Cost-Effectiveness	Political	Legal	Fiscal	Environmental	Social Vulnerability	Administrative	Hazards of Concern	Climate Change	Timeline	Community Lifelines	Other Local Objectives	Total	
2025-SanJuanCapistrano-FMP10	Update Emergency Response Plan	1	1	1	1	1	0	0	1	1	1	1	1	1	1	12	High
2025-SanJuanCapistrano-FMP11	Regional Watershed Agency Coordination	1	1	1	1	1	1	0	1	1	1	1	1	1	1	13	High
2025-SanJuanCapistrano-FMP12	Storm Drain Master Plan	1	1	1	1	1	0	0	1	1	1	0	1	1	1	11	High
2025-SanJuanCapistrano-FMP13	Emergency Warning System	1	1	1	1	0	0	0	1	1	1	1	1	1	1	11	High

Note: Volume I, Section 6 (Mitigation Strategy) conveys guidance on prioritizing mitigation actions. Low (0-6), Medium (7-10), High (11-14).

Action 2025-SanJuanCapistrano-FMP1. CRS FEMA Training

Lead Agency:	City Engineering and Environmental Services
Project Limits:	City-wide
Hazard(s) of Concern:	Flood, Riverine Flood, Coastal Flood, Sea Level Rise, Dam Failure, Tsunami
Description of the Problem:	There is limited City staff expertise in floodplain management and CRS participation.
Description of the Solution:	The City staff will attend virtual trainings and review available resources from FEMA and ASFPM at the ASFPM (https://www.floods.org/) website.
Estimated Cost:	Medium
Potential Funding Source:	Annual Budget, staff time
Implementation Timeline:	Short-term (< 5 years)
Benefits:	Providing an opportunity for City staff and officials to become further educated on floodplain management practices and standards can aid in the development of plans and procedures in a way that is conscious of the flood hazard.
CRS Category	PI
Priority	High

Action 2025-SanJuanCapistrano-FMP2. Public Floodplain Outreach

Lead Agency:	City Engineering and Environmental Services
Project Limits:	City-wide
Hazard(s) of Concern:	Flood, Coastal Flood, Riverine Flood, Tsunami, Dam Failure, Sea Level Rise
Description of the Problem:	The public awareness of flood risks is low, especially outside mapped flood zones in the City.
Description of the Solution:	Develop educational and outreach material to issue to residents on the City floodplain for distribution on a social media platform. This will include information on the flood zone, and what to do before, during, and after a flood. The City will send out a newsletter on a quarterly (four times a year) basis. The City provides updates regarding any potential hazards and how to address flooding issues in neighborhoods. The City gives updates on any current information to better assist the community.
Estimated Cost:	Low
Potential Funding Source:	Annual Budget, staff time
Implementation Timeline:	Short-term (< 5 years)
Benefits:	This action will ensure residents have access to updated information on flood hazard information to ensure safe preparation and response in the event of an emergency.
CRS Category	PI, ES
Priority	High

Action 2025-SanJuanCapistrano-FMP3. Grant Funding Opportunity Summary

Lead Agency:	City Engineering and Environmental Services
Project Limits:	City-wide
Hazard(s) of Concern:	Flood, Coastal Flood, Riverine Flood, Sea Level Rise, Dam Failure, Tsunami
Description of the Problem:	The City has funding constraints and complex permitting processes that delay obtaining funding for mitigation projects. Additionally, there are geographic constraints which limit options for traditional flood control infrastructure.
Description of the Solution:	The City will explore potential federal and state funding opportunities for mitigation projects and develop an in-house summary of potential funding sources for the City. Additionally, the City will attend grant informational webinars located on the FEMA website: Webinars and Events About Preparedness Grants | FEMA.gov.
Estimated Cost:	Low
Potential Funding Source:	Annual budget, staff time
Implementation Timeline:	Short-term (< 5 years)
Benefits:	By creating an in-house summary of potential funding sources, the City will be able to recommend and seek grant funding for particular mitigation projects the City would like to implement. These mitigation projects will protect residents from hazard events, such as flooding.
CRS Category	PI
Priority	High

Action 2025-SanJuanCapistrano-FMP4. Sea Level Rise Data and Modeling

Lead Agency:	City Engineering and Environmental Services
Project Limits:	City-wide
Hazard(s) of Concern:	Flood, Sea Level Rise, Coastal Flood
Description of the Problem:	The City has limited local data and modeling on sea level rise impacts. There is uncertainty around long-term sea level rise projections which complicates planning efforts.
Description of the Solution:	The City will work to incorporate the NOAA Sea Level Rise Viewer data into local City planning efforts. Additionally, the City will link to the NOAA Sea Level Rise Viewer on the City webpage for public access. Sea Level Rise and Coastal Flooding Impacts
Estimated Cost:	Low
Potential Funding Source:	Annual budget, staff time
Implementation Timeline:	Ongoing
Benefits:	By incorporating the NOAA Sea Level Rise Viewer into City planning efforts, staff will have the most up-to-date information on future sea level rise concerns. This will help to make informed decisions on future planning efforts to mitigate flooding impacts due to sea level rise.
CRS Category	PI, PR
Priority	Medium

Action 2025-SanJuanCapistrano-FMP5. Incorporate Coastal Flood into Planning

Lead Agency:	City Engineering and Environmental Services
Project Limits:	City-wide
Hazard(s) of Concern:	Flood, Coastal Flood
Description of the Problem:	Coastal flooding is not fully integrated into all planning and emergency preparedness efforts. Regulatory and environmental constraints limit shoreline modification options.
Description of the Solution:	During future updates of the Master Plan, Floodplain Management Plan, or the Emergency Operation Plan, the City will work to integrate coastal flooding mitigation principles and recommendations into the plans. Additionally, the City will use these coastal flood hazard mitigation principles and plan recommendations to update local building and zoning codes to create a more resilient community. The City will also use available tools and resources from FEMA and other sources to integrate climate adaptation planning such as FEMA's "Climate Adaptation Planning: Guidance for Emergency Managers" document.
Estimated Cost:	Low
Potential Funding Source:	HMGP, BRIC, FMA, Annual Budget
Implementation Timeline:	Short-term (< 5 years)
Benefits:	Provides an opportunity for coordination amongst agencies and their planning efforts to improve the overall ability to prepare for, respond to, and recover from coastal flood events.
CRS Category	PR, PI
Priority	Low

Action 2025-SanJuanCapistrano-FMP6. State Grant Manager Coordination

Lead Agency:	City Engineering and Environmental Services; State grant manager
Project Limits:	City-wide
Hazard(s) of Concern:	Flood, Riverine Flood
Description of the Problem:	The City experiences funding limitations for large-scale channels and storm drain upgrades. There are also environmental permit challenges for creek improvements.
Description of the Solution:	The City grant manager will coordinate with State grant manager to include large-scale channel and storm drain upgrades to state funding plans.
Estimated Cost:	Low
Potential Funding Source:	Annual budget, staff time
Implementation Timeline:	Short-term (< 5 years)
Benefits:	This project will connect state funding for large-scale mitigation projects within the City. These mitigation projects will further protect residents from riverine flood and other flood hazards.
CRS Category	PI, SP
Priority	Low

Action 2025-SanJuanCapistrano-FMP7. USACE H&H Modeling Training

Lead Agency:	City Engineering and Environmental Services
Project Limits:	City-wide
Hazard(s) of Concern:	Flood, Riverine Flood
Description of the Problem:	There is limited in-house technical expertise for advanced hydrologic and hydraulic analysis.
Description of the Solution:	The City Engineer or Engineering Department will send staff to the USACE H&H modelling training. These H&H courses are held virtually: Hydrology / Hydraulics Training
Estimated Cost:	Low
Potential Funding Source:	Annual budget, staff time
Implementation Timeline:	Short-term (< 5 years)
Benefits:	This training provided by USACE will enhance staff capabilities for hydrologic and hydraulic analysis for the City. It will provide the technical expertise needed to complete these in-house modeling.
CRS Category	PI, ES
Priority	Medium

Action 2025-SanJuanCapistrano-FMP8. Tsunami Ready: Public Outreach

Lead Agency:	City Engineering and Environmental Services
Project Limits:	City-wide
Hazard(s) of Concern:	Tsunami
Description of the Problem:	The City has a limited local focus on tsunami risk due to the inland location. However, public awareness of tsunami hazards is still low in nearby coastal areas as well.
Description of the Solution:	The City will conduct public outreach to all residents by providing National Weather Service safety flyers on both the City website and at the City Hall. • tsunami_safety_rules_20130912.pdf • tsunami_preparedness_20130912.pdf
Estimated Cost:	Low
Potential Funding Source:	Annual budget, staff time
Implementation Timeline:	Short-term (< 5 years)
Benefits:	This action will help to promote public awareness of tsunami hazards and help to prepare in case of a tsunami event.
CRS Category	PI, ES
Priority	Low

Action 2025-SanJuanCapistrano-FMP9. Tsunami Evacuation Routes and Evacuation Plan

Lead Agency:	City Engineering and Environmental Services
Project Limits:	City-wide
Hazard(s) of Concern:	Flood, Tsunami
Description of the Problem:	The City lacks detailed tsunami evacuation infrastructure in adjacent coastal communities. The City also has trouble in securing funding for mitigation measures in non-coastal areas.
Description of the Solution:	The City will create and install Tsunami evacuation signs along evacuation roadways to assist the public with knowing where to evacuate during this hazard event. The City will also create a Tsunami Evacuation Plan which will also explore potential funding opportunities for inland mitigation projects to address tsunami concerns.
Estimated Cost:	Medium
Potential Funding Source:	Annual budget, HMGP, PDM, BRIC
Implementation Timeline:	Short-term (< 5 years)
Benefits:	This action will provide residents will safe evacuation routes to use in the event of a tsunami evacuation. The signs will assist local EMS with evacuating residents and visitors safely in the event of a tsunami.
CRS Category	ES, PI
Priority	Low

Action 2025-SanJuanCapistrano-FMP10. Update Emergency Response Plan

Lead Agency:	City Engineering and Environmental Services
Project Limits:	City-wide
Hazard(s) of Concern:	Flood, Dam Failure
Description of the Problem:	The City is experiencing aging infrastructure and potential gaps in the current dam safety and emergency response plans.
Description of the Solution:	The City will update the Emergency Response Plan, especially the Dam Safety portion of the plan to address dam failure protocol.
Estimated Cost:	Medium
Potential Funding Source:	Annual budget,
Implementation Timeline:	Short-term (< 5 years)
Benefits:	This action will provide guidance to EMS and City staff on how to respond efficiently and effectively to hazard events, especially dam failure events. This will allow for safety measures to be in place for residents in the event of a dam failure.
CRS Category	PI, ES
Priority	High

Action 2025-SanJuanCapistrano-FMP11. Regional Watershed Agency Coordination

Lead Agency:	City Engineering and Environmental Services
Project Limits:	Regional
Hazard(s) of Concern:	Flood, Sea Level Rise, Coastal Flood
Description of the Problem:	The City lacks a comprehensive regional planning for sea level rise impacts on infrastructure and ecosystems.
Description of the Solution:	The City will coordinate with regional agencies nearby the watershed to enhance the general disaster coordination, already in place, to also include coastal flooding hazards.
Estimated Cost:	Low
Potential Funding Source:	Annual budget
Implementation Timeline:	Short-term (< 5 years)
Benefits:	This action will enhance the general disaster coordination to include coastal flood by including regional watershed agency collaboration. It will ensure safety measures for coastal flood events are coordinated approaches with other watershed communities.
CRS Category	PI, ES, PR
Priority	High

Action 2025-SanJuanCapistrano-FMP12. Storm Drain Master Plan

Lead Agency:	City Engineering and Environmental Services
Project Limits:	City-wide
Hazard(s) of Concern:	Flood, Sea Level Rise, Coastal Flood, Riverine Flood, Tsunami, Dam Failure
Description of the Problem:	The City does not have a Storm Drain Master Plan and therefor does not have data to explain the areas that most frequently flood and why.
Description of the Solution:	The City will develop a Storm Drain Master Plan to remap the boundaries and better understand areas that flood. The RFP has already been completed and next steps are underway.
Estimated Cost:	Medium
Potential Funding Source:	Annual Budget
Implementation Timeline:	Short-term (< 5 years)
Benefits:	The action will enhance the City's stormwater capabilities by providing updated information on the storm drain system in the community. By understanding where these systems flood, the City staff can update these systems to limit the severity and frequency of flood events.
CRS Category	PI, SP
Priority	High

Action 2025-SanJuanCapistrano-FMP13. Emergency Warning System

Lead Agency:	City Engineering and Environmental Services
Project Limits:	County-wide
Hazard(s) of Concern:	Flood, Riverine Flood
Description of the Problem:	The City does not have a warning system in place to alert residents of a flood event due to riverine flood.
Description of the Solution:	The City will coordinate with the County to add riverine flood alerts to the AlertOC system which is utilized for other hazard events within the City and County limits.
Estimated Cost:	Low
Potential Funding Source:	Annual budget, No cost
Implementation Timeline:	Short-term (< 5 years)
Benefits:	This action will help to promote safety and response to riverine flooding by alerting residents at the time of a flood. It will promote safe evacuation in times of flood hazards.
CRS Category	PI, ES
Priority	High

6. CITY OF SANTA ANA ANNEX

This jurisdictional annex to the Orange County Floodplain Management Plan (FMP) provides information to assist public and private sectors in the unincorporated areas with reducing losses from future hazard events. This annex is not guidance of what to do when a disaster occurs; its focus is on actions that can be implemented prior to a disaster to reduce or eliminate damage to property and people. The annex presents a general overview of the City of Santa Ana describes who participated in the planning process, assesses these area's risk, vulnerability, and capabilities, and outlines a strategy for achieving a more resilient community.

6.1 FLOODPLAIN MANAGEMENT PLANNING TEAM

The City of Santa Ana identified primary and alternate FMP points of contact and developed this plan over the course of several months, with input from many City departments. The Public Works Department and Engineering Department represented the community on the Orange County FMP Planning Partnership and supported the local planning process by securing input from persons with specific knowledge to enhance the plan. All departments were asked to contribute to the annex development through reviewing and contributing to the capability assessment, reporting on the status of previously identified actions, and participating in action identification and prioritization.

Table 6-1 summarizes City officials who participated in the development of the annex and in what capacity. Additional documentation of the City's planning activities through Planning Partnership meetings is included in Volume I.

Table 6-1. Floodplain Management Planning Team

Primary Point of Contact	Alternate Point of Contact
Name/Title: Rudy Rosas, P.E., Deputy Public Works Director/City Engineer Address: Public Works Agency, 20 Civic Center Plaza, Santa Ana, CA 92701 Phone Number: 714-647-3379 Email: rrosas@santa-ana.org	Name/Title: Craig Foster, NPDES Manager Address: Public Works Agency, 20 Civic Center Plaza, Santa Ana, CA 92701 Phone Number: (714) 647-5659 Email: cfoster@santa-ana.org
National Flood Insurance Program Floodplain Administrator	
Name/Title: Ali Pezeshkpour, Executive Director of Planning and Building, NFIP Administrator Address: Santa Ana City Hall, 20 Civic Center Plaza, Santa Ana, CA 92701 Phone Number: (714) 647-5882 Email: apezeshkpour@santa-ana.org	
Additional Contributors	
Name/Title: Jason Kwak, Building Safety Manager Method of Participation: Attended the FMP Goals and Objectives meeting.	
Name/Title: Tung Le, Principal Plan Check Engineer Method of Participation: Attended the FMP Goals and Objectives meeting.	
Name/Title: Steve Rhyner, Police Department Method of Participation: Attended the worksheet meeting. Submitted the Mitigation Action Development survey for mitigation actions.	
Name/Title: Melissa Burrola, Former Public Works Staff Method of Participation: Attended the worksheet meeting and coordinated times for City Manager and planning team to discuss annex.	

6.2 COMMUNITY PROFILE

6.2.1 Brief History

Incorporated in 1886, Santa Ana has become the governmental hub of Orange County, often referred to as Downtown Orange County. Its strategic location places the city within a 30-minute drive from numerous Southern California attractions, including four airports. The city's high density and robust transportation network allow residents and workers to adopt sustainable commuting options such as buses, trains, bicycles, and walking. This accessibility draws a diverse population that enjoys Santa Ana's unique housing options, vibrant nightlife, and cultural landmarks like the Artist's Village, Discovery Cube Orange County, Heritage Museum of Orange County, and the Santa Ana Zoo at Prentice Park. Santa Ana boasts a substantial and varied business community, with over 30,000 businesses employing more than 150,000 people. It is home to the headquarters of major companies like Behr Paint and First American Financial Corporation. In 2016, Standard and Poor's awarded Santa Ana an AA issuer credit rating (City of Santa Ana n.d.).

6.2.2 Location

Santa Ana, California, is situated in the heart of Orange County, approximately 35 miles south of Los Angeles and about 10 miles inland from the Pacific Ocean (City of Santa Ana n.d.). Covering an area of 27 square miles, Santa Ana serves as the county seat and is a major hub within the Greater Los Angeles region. The city's central location places it within easy reach of many Southern California destinations, including four airports, making it a convenient and accessible area for residents and visitors alike.

6.2.3 Governing Body Format

The City of Santa Ana operates under a Council-Manager form of government. The City Council consists of a mayor and six council members, all elected by the city's residents to serve four-year terms. The Council is responsible for setting policies, passing local ordinances, adopting the budget, appointing committees, and hiring key officials such as the City Manager, City Attorney, and City Clerk. The City Manager oversees the day-to-day operations of the city, implements the Council's policies and ordinances, and appoints department heads. This structure ensures efficient and effective governance, with a clear division of responsibilities between elected officials and professional administrators (CountyOffice.org 2025).

6.2.4 Population and Social Vulnerability

According to the U.S. Census, the 2020 population for the City of Santa Ana was 310,227. This is 33.4-percent of the total population of participating jurisdictions.

Research has shown that some populations are at greater risk from hazard events because of decreased resources or physical abilities. These populations can be more susceptible to hazard events based on a number of factors including their physical and financial ability to react or respond during a hazard, and the location and construction quality of their housing. Data from the 2023 American Community Survey indicates that there are 17,114 people 5 years of age or younger, 34,612 people 65 years of age or older, 29,038 people who are non-English speaking, 34,155 people below the poverty threshold, and 26,434 who are considered disabled.

6.3 JURISDICTIONAL CAPABILITY ASSESSMENT AND INTEGRATION

The City of Santa Ana performed an inventory and analysis of existing capabilities, plans, programs, and policies that enhance its ability to implement mitigation strategies. Volume I describes the components included in the capability assessment and their significance for floodplain management planning. The jurisdictional assessment for this annex includes analyses of the following:

- Planning and regulatory capabilities
- Development and permitting capabilities
- Administrative and technical capabilities
- Fiscal capabilities
- Education and outreach capabilities
- Classification under various community mitigation programs
- Adaptive capacity to withstand hazard events

For a community to succeed in reducing long-term risk, floodplain management must be integrated into day-to-day local government operations. As part of the floodplain management analysis, planning and /policy documents were reviewed and each jurisdiction was surveyed to obtain a better understanding of their progress toward plan integration. Development of an updated mitigation strategy provided an opportunity for the City to identify opportunities for integrating mitigation concepts into ongoing City procedures.

6.3.1 Planning and Regulatory Capability and Integration

Table 6-2 summarizes the planning and regulatory tools that are available to the City of Santa Ana.

Table 6-2. Planning and Regulatory Capability and Integration

	Jurisdiction has this?	Citation and Date (code chapter or name of plan, date of enactment or plan adoption)	Authority (local, county, state, federal)	Responsible Person, Department or Agency
CODES, ORDINANCES, & REGULATIONS				
Building Code **Adopted state building codes**	Yes	City of Santa Ana, California Municipal Code. Chapter 8 Buildings and Structures, Article II Building Code. Most recent ordinance adoption Ordinance No. NS-3032 12/18/2022	Local	Planning and Building Agency
How does this reduce risk from flood-related hazards? The purpose of this chapter is to adopt and enforce the California Building Code (2022 Edition), as amended by the city, to regulate the construction, alteration, and occupancy of buildings and structures to ensure public health, safety, and general welfare				

	Jurisdiction has this?	Citation and Date (code chapter or name of plan, date of enactment or plan adoption)	Authority (local, county, state, federal)	Responsible Person, Department or Agency
Zoning/Land Use Code	Yes	City of Santa Ana, California Municipal Code, Chapter 41 Zoning. Most recent ordinance adoption Ordinance No. NS-3076 2/4/2025	Local	Planning and Building Agency
How does this reduce risk from flood-related hazards? The purpose of this chapter, as amended by the most recent ordinances, is to regulate land use and development in a manner that promotes public health, safety, and general welfare, while accommodating evolving community needs such as outdoor dining, mobile food trucks, and compliance with updated state laws on accessory dwelling units.				
Subdivision Code	Yes	City of Santa Ana, California Municipal Code, Chapter 34 Subdivision. Most recent ordinance adaptation Ordinance No. NS-2982 1//21/2020.	Local	Planning and Building Agency
How does this reduce risk from flood-related hazards? The purpose of this chapter is to regulate the division of land to ensure orderly development, protect public health and safety, and maintain consistency with local and regional planning goals, including alignment with the county hazardous waste management plan				
Site Plan Code	No	-	-	-
How does this reduce risk from flood-related hazards?				
Stormwater Management Code	Yes	City of Santa Ana, California Municipal Code, Chapter 18 Health and Sanitation, Article IV Water Pollution, Sec. 18-156 Control of urban runoff. Most recent ordinance adoption Ordinance No. NS-2328 7/21/1997	Local	Public Works
How does this reduce risk from flood-related hazards? The purpose of this chapter is to improve water quality and comply with federal regulations by controlling urban pollutants in stormwater runoff that enters the storm drain system throughout Orange County				
Post-Disaster Recovery/ Reconstruction Code	No	-	-	-
How does this reduce risk from flood-related hazards?				
Real Estate Disclosure Requirements	No	-	-	-
How does this reduce risk from flood-related hazards?				
Growth Management	No	-	-	-
How does this reduce risk from flood-related hazards?				
Environmental Protection Ordinance(s)	Yes	Chapter 18, 18-155 Stormwater Pollution.	Local	Public Works
How does this reduce risk from flood-related hazards? The purpose of this chapter is to reduce pollutants in stormwater and non-stormwater discharges to the maximum extent practicable, in order to protect water quality and comply with federal and state regulations				

	Jurisdiction has this?	Citation and Date (code chapter or name of plan, date of enactment or plan adoption)	Authority (local, county, state, federal)	Responsible Person, Department or Agency
Flood Damage Prevention Ordinance	Yes	City of Santa Ana, California Municipal Code, Chapter 7 Floodplain Management Regulation. Most recent ordinance adoption Ordinance No. NS-2789 7/20/2009	Local	Executive Director, Planning and Building Agency
How does this reduce risk from flood-related hazards? Contains the city's floodplain management regulations.				
Wellhead Protection	No	-	-	-
How does this reduce risk from flood-related hazards? The City complies with state regulations under the jurisdiction of the Public Works Department.				
Emergency Management Ordinance	Yes	City of Santa Ana, California Municipal Code, Chapter 2 Administration, Article IV Officers, Departments, Boards and Commissions, Division 15 Emergency Service. Most recent ordinance adoption Ordinance No.	Local	Police Department
How does this reduce risk from flood-related hazards? The purpose of this chapter is to establish the city's emergency organization, coordinate emergency functions with public and private entities, and implement emergency plans and procedures to protect people and property during large-scale emergencies or disasters				
Climate Change Ordinance	No	-	-	-
How does this reduce risk from flood-related hazards?				
Other	No	-	-	-
How does this reduce risk from flood-related hazards?				
PLANNING DOCUMENTS				
Comprehensive/ Master Plan	Yes	Santa Ana General Plan. April 19, 2022	Local	Planning and Building Agency
How does this reduce risk from flood-related hazards? Economic Prosperity Element. Goal EP-2: Diverse Economic Base. Policy EP-2.12 Resiliency: Collaborate with governmental agencies and businesses to develop, maintain, and deploy physical and financial strategies that enable businesses of all sizes and their employees to withstand and recover from the acute impacts of flooding, extreme weather events, public health epidemics or pandemics. Public Services Element. Goal PS-3 Utility Infrastructure. Policy PS-3.5 Green Infrastructure: Incorporate sustainable design and low impact development (LID) techniques for stormwater facilities and new development to achieve multiple benefits, including enhancing, preserving, and creating open space and habitant; reducing flooding; and improving runoff water quality. Safety Element. Goal S-1 Flood Safety. This goal has multiple policies to protect life and minimize property damage, social and economic disruptions caused by flood and inundation hazards. Policy S-1.1 Regional Collaboration, Policy S-1.2 Climate Change, Policy S-1.3 Storm Drain Infrastructure, Policy S-1.4 Critical Infrastructure, Policy S-1.5 Flood Awareness, Policy S-1.6 Alternative Flood Control Methods, Policy S-1.7 Surface Water Infiltration, and Policy S-1.8 Development In Flood Zone.			

	Jurisdiction has this?	Citation and Date (code chapter or name of plan, date of enactment or plan adoption)	Authority (local, county, state, federal)	Responsible Person, Department or Agency
Capital Improvement Plan	Yes	City of Santa Ana Capital Improvement Program FY 2024 - 2025. Adopted 6/4/2024	Local	Public Works
How does this reduce risk from flood-related hazards? The purpose of this plan for FY 2024–2025 is to invest in long-term infrastructure improvements—including roads, parks, libraries, and public facilities—to enhance community services, promote safety, and support future growth, while aligning with regional transportation and funding requirements				
Disaster Debris Management Plan	No	-	-	-
How does this reduce risk from flood-related hazards?				
Floodplain Management or Watershed Plan	No	-	-	-
How does this reduce risk from flood-related hazards?				
Stormwater Management Plan	Yes	Storm Drain Master Plan (SDMP) Phase 2: City of Santa Ana, Orange County, California. December 2018. Local Implementation Plan 2024 Update, October 2024; Stormwater Project Master Plan, 2025.	Local	Public Works
How does this reduce risk from flood-related hazards? This plan identifies locations in the community with flooding issues and how to mitigate the flooding. This is updated in the Local Implementation Plan for 2024. The purpose of the Stormwater Project Master plan is to capture how to treat stormwater runoff for the City.				
Open Space Plan	Yes	Element in the General Plan; Parks Master Plan	Local	Planning and Building Agency; Public Works
How does this reduce risk from flood-related hazards? This plan, as included in the City of Santa Ana General Plan, is to guide the acquisition, development, maintenance, and programming of parks, recreation facilities, trails, and open space to meet community needs, promote equity, and enhance quality of life over the next decade.				
Urban Water Management Plan	Yes	Urban Water Management Plan, 2020	Local	Public Works
How does this reduce risk from flood-related hazards? The purpose of this plan is to ensure long-term water supply reliability by evaluating current and future water demands, identifying conservation strategies, and preparing for drought and emergency scenarios in compliance with California Water Code requirements				
Habitat Conservation Plan	Yes	Element in General Plan, Conservation	Local	Planning and Building Agency
How does this reduce risk from flood-related hazards? The purpose of the Conservation Element in the City of Santa Ana General Plan is to protect and enhance the city's natural resources—including air quality, water, energy, and open space—while promoting environmental sustainability, climate resilience, and equitable access to a healthy urban environment for all residents				

	Jurisdiction has this?	Citation and Date (code chapter or name of plan, date of enactment or plan adoption)	Authority (local, county, state, federal)	Responsible Person, Department or Agency
Economic Development Plan	Yes	Element in General Plan, Economic Prosperity	Local	Community Development Agency
How does this reduce risk from flood-related hazards? The purpose of the Economic Prosperity Element in the City of Santa Ana General Plan is to foster a resilient and inclusive economy by supporting job creation, workforce development, innovation, and entrepreneurship, while ensuring equitable access to economic opportunities for all residents				
Community Wildfire Protection Plan	No	-	-	-
How does this reduce risk from flood-related hazards?				
Transportation Plan	Yes	Element in General Plan, Mobility Element	Local	Planning and Building Agency
How does this reduce risk from flood-related hazards? The purpose of the Mobility Element in the City of Santa Ana General Plan is to create a safe, efficient, and sustainable transportation network that supports all modes of travel—walking, biking, transit, and driving—while enhancing connectivity, reducing environmental impacts, and promoting equitable access to mobility options for all residents				
Agriculture Plan	No	-	-	-
How does this reduce risk from flood-related hazards?				
Climate Action/ Resilience/Sustainability Plan	Yes	Santa Ana Climate Action Plan. December 2015; update by the end of 2025.	Local	Public Works
How does this reduce risk from flood-related hazards? This plan is currently being updated and will be completed by the end of 2025.				
Tourism Plan	Yes	Travel Santa Ana, included in the 2023 Annual Report.	Local	Community Development Agency
How does this reduce risk from flood-related hazards? This plan outlines the City's strategic goals and initiatives for promoting tourism and economic vitality in Santa Ana.				
Business/ Downtown Development Plan	Yes	Element in General Plan, Economic Prosperity Element & Land Use Element	Local	Planning and Building Agency
How does this reduce risk from flood-related hazards? The Economic Prosperity Element focuses on fostering a resilient and inclusive economy, supporting job creation, and promoting business growth throughout the city. The Land Use Element guides the physical development of Santa Ana, including revitalization strategies for the downtown area, mixed-use development, and zoning policies that support commercial and economic activity				
Other	Yes	Parks Master Plan. Santa Ana Parks, Facilities, Trails, and Open Space. May 2022	Local	Public Works
How does this reduce risk from flood-related hazards? The purpose of this plan, adopted in 2022, is to guide the long-term investment in parks, recreation facilities, trails, and programs over the next decade by promoting healthy lifestyles, improving equity in green space access, enhancing community livability, and supporting environmental justice through inclusive and data-driven planning.				

	Jurisdiction has this?	Citation and Date (code chapter or name of plan, date of enactment or plan adoption)	Authority (local, county, state, federal)	Responsible Person, Department or Agency
RESPONSE/RECOVERY PLANNING				
Emergency Operations Plan	Yes	Santa Ana EOP, May of 2024	Local	Police Department
How does this reduce risk from flood-related hazards? The purpose of this plan is to provide a coordinated framework for preparing for, responding to, and recovering from natural or human-caused disasters or emergencies, in alignment with Section 2-645 of the Municipal Code and the California Emergency Services Act.				
Continuity of Operations Plan	No	-	-	-
How does this reduce risk from flood-related hazards?				
Substantial Damage Response Plan	No	-	-	-
How does this reduce risk from flood-related hazards?				
Threat and Hazard Identification and Risk Assessment	Yes	Included in County THIRA, 2024	Local	Police Department leads for the County
How does this reduce risk from flood-related hazards? The County THIRA goes through a yearly update. Next update in progress for 2025.				
Post-Disaster Recovery Plan	Yes	Element in EOP	Local	Police Department
How does this reduce risk from flood-related hazards? The EOP discusses post-disaster recovery planning throughout the plan by outlining roles, responsibilities, and coordination strategies for long-term recovery efforts following a disaster. This includes restoring essential services, supporting displaced residents, and rebuilding infrastructure in alignment with hazard mitigation and resilience goals.				
Other	Yes	Hazard Mitigation Plan. October 11, 2022	Local	Police Department
How does this reduce risk from flood-related hazards? The hazard mitigation plan covers the types of the flooding experienced by the community and this includes riverine, dam failure, and flash flooding. Lists the flood mitigation action items. FLD-1 due to potential for flood damage and overall security, relocate the main City of Santa Ana I.T. server room from the City Hall basement to the police department. FLD-2 improve drainage at City Hall loading dock. FLD-3 Improve the various significantly undersized existing city storm drain systems. FLD-4 City owned facilities will use porous pavement, vegetative buffers, and islands in large parking areas. FLD 5 Encourage the use of permeable pavement or other infiltration BMPs to reduce runoff and increase groundwater recharge. FLD-6 Fund and complete an update to the Stormwater Project Master Plan. FLD-7 Prepare and adopt a Storm Drain Master Plan. FLD-8 increase dimension of drainage culverts in flood-prone areas. FLD-9 at city-owned facilities, perform regular drainage maintenance. FLD-10 floodproofing water and wastewater treatment facilities located in flood hazard areas. FLD-11 Install and/or upgrade stormwater pumping stations. FLD-12 Installing back-up generators or other power sources for pumping and lift stations in sanitary sewer systems along with other measures. FLD-13 continue participation in NPDES program and seek funding for administrative, engineering, and construction aspects of compliance. FLD-14 as per the Storm Drain Master Plan seek funding to implement the top 10 capital improvement projects. FLD-15 redesign or reengineer sewer lift stations to prevent flooding inside stations.				

6.3.2 Development and Permitting Capability

Table 6-3 summarizes the capabilities of the City of Santa Ana to oversee and track development.

Table 6-3. Development and Permitting Capability

	Yes/No	Comment
Do you issue development permits? • **If you issue development permits, what department is responsible?** • **If you do not issue development permits, what is your process for tracking new development?**	Yes	Planning and Building Agency
Are permits tracked by hazard area? (For example, floodplain development permits.)	UNK	-
Do you have a buildable land inventory? • **If you have a buildable land inventory, please describe**	Yes	Permitting management software which includes all the parcels.
Describe the level of buildout in your jurisdiction.	-	The City is almost entirely built out.

6.3.3 Administrative and Technical Capability

Table 6-4 summarizes potential staff and personnel resources available to the City of Santa Ana and their current responsibilities that contribute to floodplain management.

Table 6-4. Administrative and Technical Capabilities

Resources	Available?	Comment
ADMINISTRATIVE CAPABILITY		
Planning Board	Yes	Planning Commission
Zoning Board of Adjustment	Yes	Planning Commission
Planning Department	Yes	Planning and Building Agency
Mitigation Planning Committee	Yes	Was enacted for the hazard mitigation plan update.
Environmental Board/Commission	Yes	Environmental and Transportation Advisory Commission
Open Space Board/Committee	Yes	Parks and Recreation Commission
Economic Development Commission/Committee	Yes	Community Development Commission
Public Works/Highway Department	Yes	Public Works Department
Construction/Building/Code Enforcement Department	Yes	Planning and Building Agency Construction right-of way overseen by Public Works Department.
Emergency Management/Public Safety Department	Yes	Police Department
Maintenance programs to reduce risk (stormwater maintenance, tree trimming, etc.)	Yes	Public Works Department is responsible for these programs.
Mutual aid agreements	Yes	Police Department, Public Works, and Water and Wastewater have mutual aid agreements. Statewide agreements.
Human Resources Manual - Do any job descriptions specifically include identifying or implementing mitigation projects or other efforts to reduce natural hazard risk?	No	-
Other	No	-

Resources	Available?	Comment
TECHNICAL/STAFFING CAPABILITY		
Planners or engineers with knowledge of land development and land management practices	Yes	Planning and Building Agency
Engineers or professionals trained in building or infrastructure construction practices	Yes	Public Works Department
Planners or engineers with an understanding of natural hazards	Yes	Public Works and Planning and Building Agency
Staff with expertise or training in benefit/cost analysis	No	Rely on consultants.
Professionals trained in conducting damage assessments	Yes	Building inspectors in Planning and Building Agency have certifications to conduct damage assessments.
Personnel skilled or trained in GIS and/or Hazus applications	Yes	Staff on hand with GIS training.
Staff that work with socially vulnerable populations or underserved communities	Yes	Community Development Agency – Housing Division. They work with work centers and housing needs. Planning and Building Agency – Environmental Justice concerns.
Public Information Officer	Yes	Police Department and City Manager's Office both have a PIO.
Surveyors	No	-
Emergency manager	Yes	Police Department
CRS Coordinator	No	-
Resilience Officer	No	-
Other (this could include stormwater engineer, environmental specialist, etc.)	No	-

6.3.4 Fiscal Capability

Table 6-5 summarizes financial resources available to the City of Santa Ana.

6.3.5 Education and Outreach Capability

Table 6-6 summarizes the education and outreach resources available to the City of Santa Ana.

6.3.6 Community Classifications

Table 6-7 summarizes classifications for community programs available to the City of Santa Ana.

Table 6-5. Fiscal Capabilities

Financial Resources	Accessible or Eligible to Use?
Community Development Block Grants (CDBG, CDBG-DR)	Yes, but not only for floodplain management (accessible).
Capital improvement project funding	Yes, but not only for floodplain management (accessible).
Authority to levy taxes for specific purposes	Yes, but not only for floodplain management (accessible).
User fees for water, sewer, gas, or electric service	Yes, but not only for floodplain management (accessible).
Impact fees for homebuyers or developers of new development/homes	Yes, but not only for floodplain management (accessible).
Stormwater utility fee	No
Incur debt through general obligation bonds	No
Incur debt through special tax bonds	No
Incur debt through private activity bonds	No
Withhold public expenditures in hazard-prone areas	No
Other federal or state funding programs	Yes, received local and state grants for stormwater projects.
Open Space Acquisition funding programs	No
Other (for example, Clean Water Act 319 Grants [Nonpoint Source Pollution])	No

Table 6-6. Education and Outreach Capabilities

Outreach Resources	Available?	Comment
Public information officer or communications office	Yes	Paul Eakins (City Manager's Office) is PIO and manages the City's Social Media.
Personnel skilled or trained in website development	Yes	Paul Eakins (City Manager's Office) is PIO and manages the City's Social Media.
Floodplain management information available on your website	No	-
Social media for floodplain management education and outreach	Yes	Paul Eakins (City Manager's Office) is PIO and manages the City's Social Media.
Citizen boards or commissions that address issues related to floodplain management	No	-
Warning systems for hazard events	No	-
Natural disaster/safety programs in place for schools	No	-
Organizations that conduct outreach to socially vulnerable populations and underserved populations	No	-
Public outreach mechanisms / programs to inform citizens on natural hazards, risk, and ways to protect themselves during such events	No	-

Table 6-7. Community Classifications

Program	Participating?	Classification	Date Classified
Community Rating System (CRS)	No	-	-
Building Code Effectiveness Grading Schedule (BCEGS)	Yes	N/A	UNK
Public Protection (ISO Fire Protection Classes 1 to 10)	Yes – through OCFA	UNK	UNK
National Weather Service StormReady Certification	No	-	-
Firewise Communities classification	No	-	-
Other: Organizations with mitigation focus (advocacy group, non-government)	No	-	-

N/A = Not applicable; — = Unavailable

6.3.7 Adaptive Capacity

Adaptive capacity is defined as "the ability of systems, institutions, humans and other organisms to adjust to potential damage, to take advantage of opportunities, or respond to consequences" (IPCC 2022). Each jurisdiction has a unique combination of capabilities to adjust to, protect from, and withstand a future hazard event, future conditions, and changing risk. Table 6-8 summarizes the adaptive capacity for each identified hazard of concern and the City's capability to address related actions using the following classifications:

- Strong: Capacity exists and is in use.
- Moderate: Capacity might exist; but is not used or could use some improvement.
- Weak: Capacity does not exist or could use substantial improvement

Table 6-8. Adaptive Capacity

Hazard	Adaptive Capacity - Strong/Moderate/Weak
Flood	Moderate
Riverine Flood	Moderate
Coastal Flood	Strong
Sea Level Rise	Strong
Tsunami	Strong
Dam Failure	Moderate

6.4 NATIONAL FLOOD INSURANCE PROGRAM COMPLIANCE

This section provides specific information on the management and regulation of the regulatory floodplain, including current and future compliance with the National Flood Insurance Program (NFIP). The floodplain administrator listed in Table 6-1 is responsible for maintaining this information.

6.4.1 NFIP Statistics

Table 6-10 summarizes the NFIP policy and claim statistics for the City of Santa Ana.

Table 6-9. City of Santa Ana NFIP Summary of Policy and Claim Statistics

# Claims (Losses)	**16**
Total Loss Payments	**$139,959.90**
# Repetitive Loss Properties (NFIP definition)	**7**
# Repetitive Loss Properties (FMA definition)	**0**
# Severe Repetitive Loss Properties (NFIP definition)	**0**
# Severe Repetitive Loss Properties (FMA definition)	**0**

NFIP Definition of Repetitive Loss: The NFIP defines a repetitive loss property as any insurable building for which two or more claims of more than $1,000 were paid by the NFIP within any rolling 10-year period since 1978.

FMA Definition of Repetitive Loss: FEMA's Flood Mitigation Assistance (FMA) program defines a repetitive loss property as any insurable building that has incurred flood-related damage on two occasions, in which the cost of the repair, on average, equaled or exceeded 25 percent of the market value of the structure at the time of each such flood event.

Definition of Severe Repetitive Loss: A residential property covered under an NFIP flood insurance policy and: (a) That has at least four NFIP claim payments over $5,000 each, and the cumulative amount of such claims payments exceeds $20,000; or (b) For which at least two separate claims payments have been made with the cumulative amount of the building portion of such claims exceeding the market value of the building. At least two of the claims must have occurred within any 10-year period, more than 10 days apart.

Source: FEMA, 2024.

6.4.2 Flood Vulnerability Summary

Error! Reference source not found.. provides a summary of the NFIP program in the City of Santa Ana.

Table 6-10. NFIP Summary

NFIP Topic	Comments
Flood Vulnerability Summary	
Describe areas prone to flooding in your jurisdiction.	Widespread flooding observed in Downtown Santa Ana.
Do you maintain a list of properties that have been damaged by flooding?	City did not provide this information.
Do you maintain a list of property owners interested in flood mitigation?	City did not provide this information.
How many homeowners and/or business owners are interested in mitigation (elevation or acquisition)?	City did not provide this information.
Are any RiskMAP projects currently underway in your jurisdiction? If so, state what projects are underway.	City did not provide this information.
How do you make Substantial Damage determinations?	City did not provide this information.
How many Substantial Damage determinations were declared for recent flood events in your jurisdiction?	City did not provide this information.
How many properties have been mitigated (elevation or acquisition) in your jurisdiction? If there are mitigation properties, how were the projects funded?	City did not provide this information.
Do your flood hazard maps adequately address the flood risk within your jurisdiction? If not, state why.	City did not provide this information.
NFIP Compliance	
What local department is responsible for floodplain management?	City did not provide this information.
Are any certified floodplain managers on staff in your jurisdiction?	City did not provide this information.
Do you have access to resources to determine possible future flooding conditions from climate change?	City did not provide this information.

NFIP Topic	Comments
Does your floodplain management staff need any assistance or training to support its floodplain management program? If so, what type of assistance/training is needed?	City did not provide this information.
Provide an explanation of NFIP administration services you provide (e.g., permit review, GIS, education/outreach, inspections, engineering capability)	City did not provide this information.
How do you determine if proposed development on an existing structure would qualify as a substantial improvement?	City did not provide this information.
What are the barriers to running an effective NFIP program in the community, if any?	City did not provide this information.
Does your jurisdiction have any outstanding NFIP compliance violations that need to be addressed? If so, state the violations.	City did not provide this information.
When was the most recent Community Assistance Visit (CAV) or Community Assistance Contact (CAC)?	City did not provide this information.
What is the local law number or municipal code of your flood damage prevention ordinance?	City did not provide this information.
What is the date that your flood damage prevention ordinance was last amended?	City did not provide this information.
Does your floodplain management program meet or exceed minimum requirements? If exceeds, in what ways?	City did not provide this information.
Are there other local ordinances, plans or programs (e.g., site plan review) that support floodplain management and meeting the NFIP requirements? For instance, does the planning board or zoning board consider efforts to reduce flood risk when reviewing variances such as height restrictions?	City did not provide this information.
Does your community plan to join the CRS program or is your community interested in improving your CRS classification?	The City may explore the feasibility of becoming a CRS community.

6.5 GROWTH/DEVELOPMENT TRENDS

Understanding how past, current, and projected development patterns have or are likely to increase or decrease risk in hazard areas is a key component to appreciating a jurisdiction's overall risk to its hazards of concern. Recent and expected future development trends, including major residential/commercial development and major infrastructure development, are summarized in Table 6-11 through Table 6-13.

Table 6-11. Number of Building Permits for New Construction Issued Since 2020

	New Construction Permits Issued			
	Single Family	Multi-Family	Other (commercial, mixed-use, etc.)	Total
2020				
Total Permits	The City did not provide building permit information.			
Permits within SFHA				
2021				
Total Permits	The City did not provide building permit information.			
Permits within SFHA				
2022				
Total Permits	The City did not provide building permit information.			
Permits within SFHA				
2023				
Total Permits	The City did not provide building permit information.			
Permits within SFHA				
2024				
Total Permits	The City did not provide building permit information.			
Permits within SFHA				

SFHA = Special Flood Hazard Area (1% flood event)

Table 6-12. Recent Major Development and Infrastructure from 2020 to Present

Property or Development Name	Type of Development	# of Units / Structures	Location (address and/or block and lot)	Known Hazard Zones*	Description / Status of Development
The City did not provide development information.					

Table 6-13. Known or Anticipated Major Development and Infrastructure in the Next Five Years

Property or Development Name	Type of Development	# of Units / Structures	Location (address and/or block and lot)	Known Hazard Zones*	Description / Status of Development
The City did not provide development information.					

6.6 JURISDICTIONAL RISK ASSESSMENT

The hazard profiles in Volume I provide detailed information regarding each planning partner's vulnerability to the identified hazards, including summaries of the City of Santa Ana's risk assessment results and data used to determine the hazard ranking. Key local risk assessment information is presented below.

6.6.1 Hazard Area

Maps of hazard areas in the City are shown in Figure 6-1 and Figure 6-2. These maps are based on the best available data at the time of the preparation of this plan and are adequate for planning purposes. Maps are provided only for hazards that can be identified clearly using mapping techniques and technologies and for which Orange County has significant exposure. The maps show the location of potential new development, where available.

Figure 6-1. City of Santa Ana Dam Inundation and FEMA Flood Hazard Area Extent and Location Map

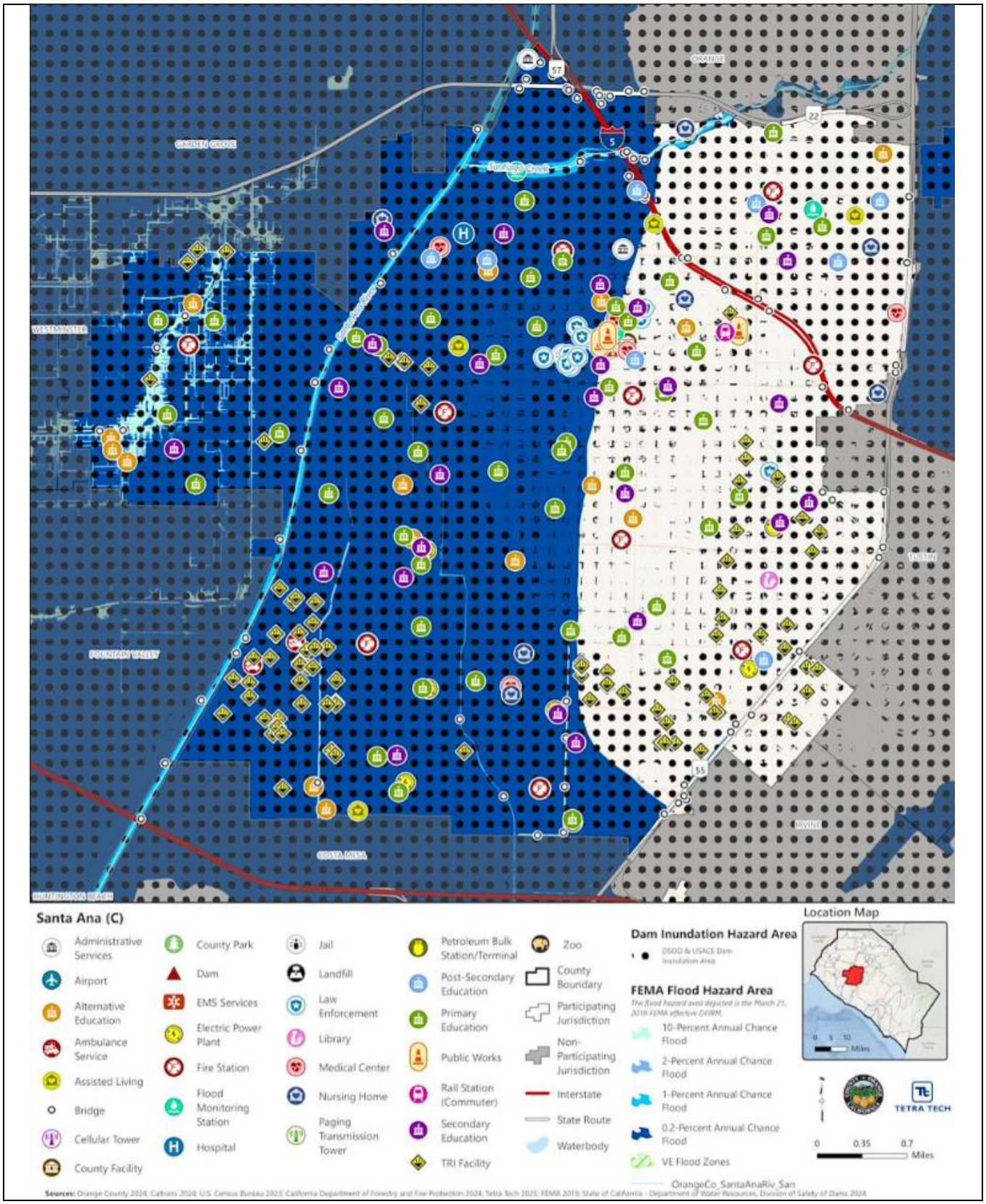
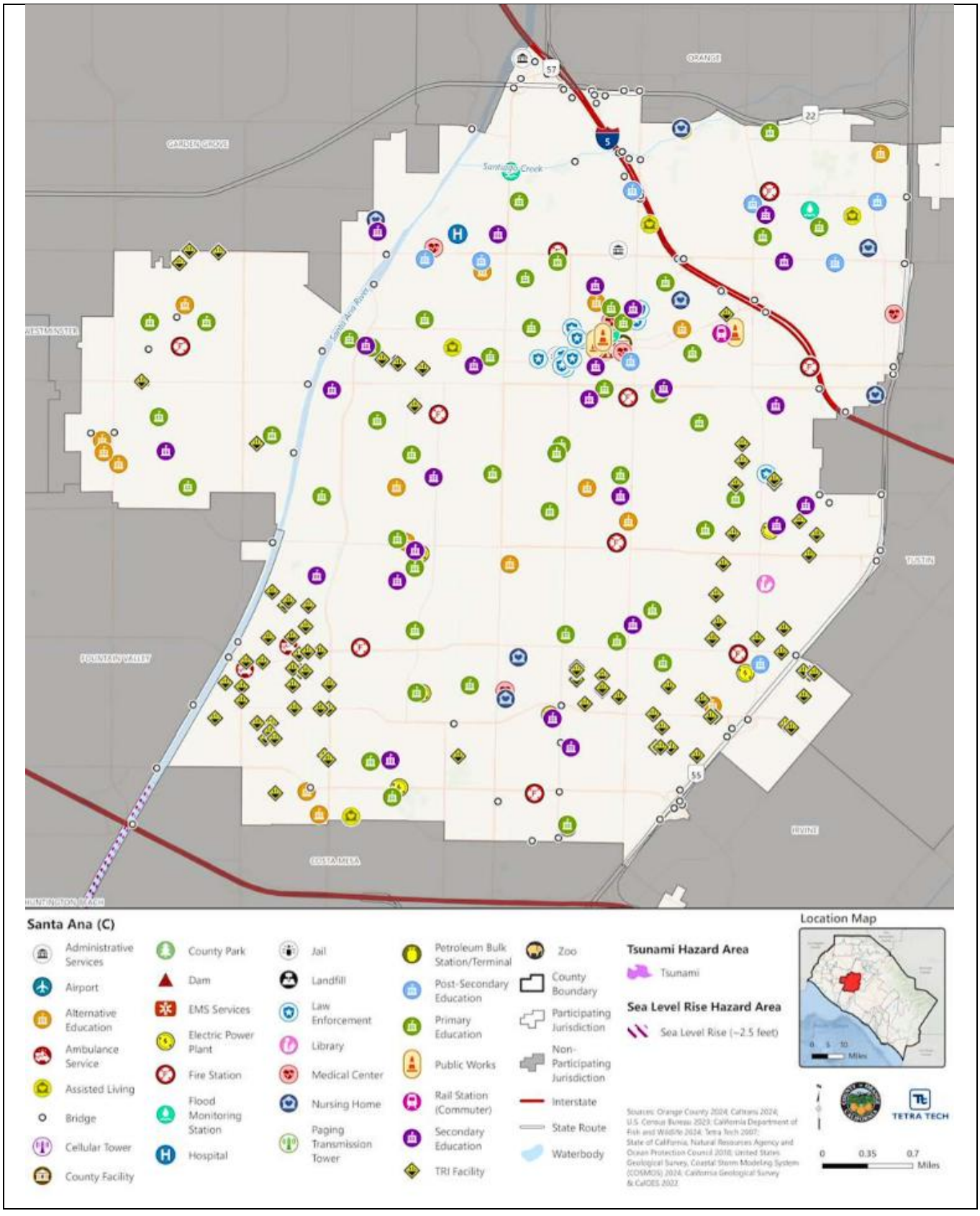


Figure 6-2. City of Santa Ana Tsunami and Sea Level Rise Hazard Area Extent and Location Map



6.6.2 Hazard Event History

The history of natural and non-natural hazard events in Orange County is detailed in Volume I, where each hazard profile includes a chronology of historical events that have affected the County and its municipalities. Table 6-14 provides details on loss and damage in the City of Santa Ana during hazard events since 2020.

Table 6-14. Hazard Event History in City of Santa Ana

Dates of Event	Event Type (Disaster Declaration)	Summary of Event	Summary of Damage and Losses in Santa Ana
September 16, 2015	-	An 8.3 magnitude earthquake off Chile's coast on the 16th prompted a tsunami advisory from Orange County to north of San Luis Obispo. Beaches, harbors, piers, and marinas in several cities, including Seal Beach and Huntington Beach, were closed through the 17th. Tsunami waves under one foot were observed along the Orange County coast. The Orange County EOC reported no significant flooding but warned of strong currents and dangerous waves.	No impacts were recorded for the City.
January 18, 2017 – January 23, 2017	DR-4305-CA	Severe winter storm, mudslides, and flooding occurred throughout the region. Water damage and disruptions were seen in the County.	Widespread flooding observed in Downtown Santa Ana
January 22, 2017	-	Heavy rain caused flash flooding across Orange County, resulting in $100,000 in property damages. A water rescue took place on Hamilton Ave. at the Santa Ana River in Huntington Beach. Streets from Sunset Beach to Santa Ana to Newport Beach were flooded with 1-3 feet of water. Many vehicles were stranded in floodwaters, including several along Highway 55.	No impacts were recorded for the City.
February 17, 2017	-	Flood waters from the East Garden Grove-Wintersburg Channel overflowed, causing $50,000 in property damages and flooding a mobile home park.	No impacts were recorded for the City.
May 24, 2017	-	High tides of 6.5 feet caused minor street flooding and $10,000 in property damages on Balboa Island, with some water entering houses near 36th and Finley Streets. The flooding was exacerbated by the recent demolition of a protective sea wall.	No impacts were recorded for the City.
October 7, 2017	-	Lifeguards reported 6-8 ft surf on the 7th and 8th in Newport and Huntington Beach, with peak waves of 15 ft at the Wedge. Coastal flooding during high tide on the Balboa Peninsula in Newport Beach caused $25,000 in property damages. The beach parking lot, nearby streets, and homes were flooded, and several cars were swamped. In Capistrano Beach, large waves shattered a window in a home.	No impacts were recorded for the City.
February 13, 2019	-	Flash flooding occurred in Laguna Beach with up to 2 inches of rain in 3 hours inundated storm channels, causing $80,000 in property damages. Streets were closed, and homes were threatened by the rising waters.	No impacts were recorded for the City.

Dates of Event	Event Type (Disaster Declaration)	Summary of Event	Summary of Damage and Losses in Santa Ana
April 6, 2020	-	Heavy rainfall occurred in San Juan Capistrano which resulted in one inch of rain in just 20 minutes. In Silverado Canyon, 0.88 of rain was reported in 1 hour from two rain gauges.	No impacts were recorded for the City.
July 3, 2020	-	High tide near 6.8 feet and high surf caused minor coastal flooding in Newport Beach, resulting in $40,000 in property damages. Flooding extended up to three blocks inland, and a sailboat was washed ashore and destroyed.	No impacts were recorded for the City.
March 10, 2021	-	Mud and debris flows from the Bond Fire caused $75,000 in property damages, damaging 8 vehicles and 6 homes. Swift water rescues were performed around 6 to 7 am. Mud covered at least 3 locations on Silverado Canyon Road and at Silverado Cafe, with rainfall rates reaching 0.20 inches in 15 minutes.	No impacts were recorded for the City.
December 14, 2021	-	Debris flows from the Bond Fire scar and Silverado Canyon caused $800,000 in property damages. Santiago Creek Road was blocked by high water and mud, while Jackson Creek Road was flooded with mud and debris. Rainfall rates reached up to 1.2 inches at Irvine Lake and Santiago Canyon.	No impacts were recorded for the City.
January 15, 2022	-	A Tsunami Advisory was issued at 5:03 AM for the Orange County Coast. Wireless Emergency Alerts and sirens were activated. The first wave arrived around 8 AM, causing coastal damage, including a drifting buoy off Huntington Bay.	No impacts were recorded for the City.
January 8, 2023 – January 31, 2023	EM-3591-CA	EM-3591-CA was an emergency declaration for California due to severe winter storms, flooding, and mudslides from January 8 to January 31, 2023. Issued on January 9, 2023, it provided federal assistance to support state, local, and tribal response efforts.	No impacts were recorded for the City.
March 1, 2023	-	Caltrans issued a Sig Alert for flooding at the I-5 and Highway 55 transition, causing $10,000 in property damages. Approximately 0.8 inches of rain fell in the area.	No impacts were recorded for the City.
March 9, 2023 – July 20, 2023	EM-3592-CA	Local media reported coastal flooding up to 18 inches deep near Seal Beach Pier due to high tide and surf. At least one car was swamped, but no damage to homes or businesses was confirmed.	No impacts were recorded for the City.

EM = Emergency Declaration (FEMA); FEMA = Federal Emergency Management Agency; DR = Major Disaster Declaration (FEMA); N/A = Not applicable
Source: NWS, 2024; FEMA, 2024

6.6.3 Hazard Ranking and Vulnerabilities

The hazard profiles in Volume I have detailed information regarding each planning partner's vulnerability to the identified hazards. The following presents key risk assessment results for the City of Santa Ana.

Hazard Ranking

The participating jurisdictions have differing degrees of vulnerability to the hazards of concern, so each jurisdiction ranked its own degree of risk to each hazard. The community-specific hazard ranking is based on problems and impacts identified by the risk assessment presented in Volume I. The ranking process involves an assessment of the likelihood of occurrence for each hazard; the potential impacts of the hazard on people, property, and the economy; community capabilities to address the hazard; and changing future climate conditions.

Table 6-15 shows the City of Santa Ana's final hazard rankings for identified hazards of concern. Mitigation action development uses the ranking to target hazards with the highest risk. Hazards with a risk ranking of "low," such as Flood, Coastal Flood, Sea Level Rise, and Tsunami, may not present the most risk but remain a concern and mitigation action priority for the County and the City of Santa Ana. Stakeholder feedback indicates although Flood risk ranking is low, Orange County communities are still focused on addressing mitigation projects related to the hazard. In addition, hazards ranked as "high," such as Dam Failure, does not necessarily indicate a surety of the hazard occurring or a prevalence of high-hazard dams, rather this ranking suggests that if a dam failure were to occur the potential impacts on the people, property, and economy would be very significant. The risk associated with "high" ranking are categorized as low-probability and high-consequence events.

Table 6-15. Hazard Ranking

Hazard	Rank
Flood	Low
Riverine Flood	Medium
Coastal Flood	Low
Sea Level Rise	Low
Tsunami	Low
Dam Failure	High

Note: The scale is based on the hazard rankings established in Volume I, modified as appropriate based on review by the jurisdiction

Critical Facilities

Table 6-16 identifies those critical facilities in the community that are located in the 1 percent and 0.2 percent annual chance event floodplains – i.e., Special Flood Hazard Areas (SFHA).

Table 6-16. Critical Facility Exposure to the Special Flood Hazard Area (SFHA)

Name	Type	SFHA Exposure	
		1% Annual Chance Event	0.2% Annual Chance Event
Child Support Services	Administrative Services	N	N
City Hall - City of Santa Ana	Administrative Services	N	Y
County Administration South (CAS) - Internal Audit	Administrative Services	N	Y
County Branch Library - Orange County Public Library Administrative Headquarters	Administrative Services	N	N
County Conference Center	Administrative Services	N	Y
County Procurement Office	Administrative Services	N	Y
Headquarters	Administrative Services	N	N
Main Office	Administrative Services	N	Y

Name	Type	SFHA Exposure	
		1% Annual Chance Event	0.2% Annual Chance Event
OC Construction Materials Lab	Administrative Services	N	N
Youth Guidance Center	Administrative Services	N	Y
Amazing Stars Academy United	Alternative Education	N	N
Ari Guiragos Minassian Armenian	Alternative Education	N	Y
Bethel Baptist	Alternative Education	Y	Y
Calvary Chapel High / Maranatha Christian	Alternative Education	N	Y
Calvary Chapel Private School Program	Alternative Education	N	Y
Irvine Hebrew Day School	Alternative Education	N	N
Mater Dei High School	Alternative Education	N	Y
Middle College High	Alternative Education	N	Y
Montessori International Academy	Alternative Education	N	N
Santa Clara Nursery School	Alternative Education	N	Y
School of Our Lady	Alternative Education	N	Y
St. Anne	Alternative Education	N	N
St. Barbara Elementary	Alternative Education	N	Y
St. Joseph Elementary	Alternative Education	N	N
Storybook Preschool & Private	Alternative Education	N	Y
Sunflower Preschool & Kindergarten	Alternative Education	N	Y
American Med Ambulance	Ambulance Service	N	Y
Doctors Ambulance Service	Ambulance Service	N	Y
CRESCENT LANDING AT SANTA ANA MEMORY CAR	Assisted Living	N	Y
HOLLYBROOK SENIOR LIVING OF ORANGE	Assisted Living	N	N
RYAN'S REACH R&R II	Assisted Living	N	N
ST. FRANCIS HOME	Assisted Living	N	Y
TOWN & COUNTRY	Assisted Living	N	N
17TH ST NB ON RA - Bridge	Bridge	N	N
17TH STREET - Bridge	Bridge	N	N
1ST ST - Bridge	Bridge	N	N
4TH ST - Bridge	Bridge	N	N
4TH ST-S55 ON RAMP - Bridge	Bridge	N	N
55-405 HOV CONNECT - Bridge	Bridge	N	N
BEDFORD ROAD - Bridge	Bridge	N	Y
BNSF, AMTRAK, METRO - Bridge	Bridge	N	N
BRDWY NB OFF-RP - Bridge	Bridge	N	Y
BRISTOL ST-LA VETA - Bridge	Bridge	N	Y
BROADWAY - Bridge	Bridge	N	Y
CAMBRIDGE STREET - Bridge	Bridge	N	N
DYER RD-S55 ON RAM - Bridge	Bridge	N	Y
E22-N5 CONNECTOR - Bridge	Bridge	N	Y
E22-N5&N57 CONN - Bridge	Bridge	N	Y
E22-S5 CONNECTOR - Bridge	Bridge	N	Y

Name	Type	SFHA Exposure	
		1% Annual Chance Event	0.2% Annual Chance Event
EAST GARDEN GROVE-WINTERSBURG CHANNEL - Bridge	Bridge	Y	Y
EAST GARDEN GROVE-WINTERSBURG CHANNEL - Bridge	Bridge	Y	Y
EAST GARDEN GROVE-WINTERSBURG CHANNEL - Bridge	Bridge	N	Y
EAST GARDEN GROVE-WINTRSBURG CHANNEL - Bridge	Bridge	N	Y
EAST GARDEN GROVE-WINTRSBURG CHANNEL - Bridge	Bridge	Y	Y
FOURTH STREET - Bridge	Bridge	N	N
GREENVILLE-BANNING CHANNEL - Bridge	Bridge	N	Y
I 5 NB - Bridge	Bridge	N	Y
I 5 SB - Bridge	Bridge	N	Y
INTERSTATE 5 - Bridge	Bridge	N	N
INTERSTATE 5 NB - Bridge	Bridge	N	N
INTERSTATE 5 NB - Bridge	Bridge	N	N
INTERSTATE 5 SB - Bridge	Bridge	N	N
INTERSTATE 5 SB - Bridge	Bridge	N	N
LINCOLN AVE - Bridge	Bridge	N	N
MAIN ST - Bridge	Bridge	N	Y
MAIN ST - Bridge	Bridge	N	Y
MCFADDEN STREET - Bridge	Bridge	N	N
N5-1ST OFF-RAMP - Bridge	Bridge	N	N
S5&S57-E22 CONN - Bridge	Bridge	N	Y
S5&S57-E22 CONNECT - Bridge	Bridge	N	Y
S5&S57-W22 CONN - Bridge	Bridge	N	Y
S5-4TH ST & MABURY - Bridge	Bridge	N	N
S55-DYER RD OFF RP - Bridge	Bridge	Y	Y
S55-MACAR OFF RAMP - Bridge	Bridge	Y	Y
S57-E22 CONNECTOR - Bridge	Bridge	N	Y
S57-S5 CONNECTOR - Bridge	Bridge	N	Y
S57-W22 CONNECTOR - Bridge	Bridge	N	Y
S5-MAIN ST OFF-RP - Bridge	Bridge	N	Y
SANTA ANA DELHI CHANNEL - Bridge	Bridge	N	Y
SANTA ANA DELHI CHANNEL - Bridge	Bridge	N	Y
SANTA ANA DELHI CHANNEL - Bridge	Bridge	N	Y
SANTA ANA DELHI CHANNEL - Bridge	Bridge	N	Y
SANTA ANA DELHI CHANNEL - Bridge	Bridge	N	Y
SANTA ANA GARDENS CHANNEL - Bridge	Bridge	N	Y
SANTA ANA GARDENS CHANNEL - Bridge	Bridge	N	Y
SANTA ANA RIVER - Bridge	Bridge	N	Y

Name	Type	SFHA Exposure	
		1% Annual Chance Event	0.2% Annual Chance Event
SANTA ANA RIVER CHANNEL - Bridge	Bridge	N	Y
SANTA ANA RIVER CHANNEL - Bridge	Bridge	N	Y
SANTA ANA RIVER CHANNEL - Bridge	Bridge	N	Y
SANTA ANA RIVER CHANNEL - Bridge	Bridge	N	Y
SANTA ANA RIVER CHANNEL - Bridge	Bridge	N	Y
SANTA ANA SANTA FE CHANNEL - Bridge	Bridge	N	N
SANTA ANA-SANTA FE CHANNEL - Bridge	Bridge	N	N
SANTA CLARA AVE - Bridge	Bridge	N	N
SANTA CLARA-N5 ON - Bridge	Bridge	N	Y
SANTIAGO CREEK CHANNEL - Bridge	Bridge	Y	Y
SANTIAGO CREEK CHANNEL - Bridge	Bridge	Y	Y
SANTIAGO CREEK CHANNEL - Bridge	Bridge	Y	Y
STATE ROUTE 22 - Bridge	Bridge	N	Y
STATE ROUTE 22 - Bridge	Bridge	N	Y
STATE ROUTE 22 - Bridge	Bridge	N	Y
STATE ROUTE 55 - Bridge	Bridge	N	N
STATE ROUTE 55 - Bridge	Bridge	N	N
STATE ROUTE 55 - Bridge	Bridge	N	N
WARNER AVE - Bridge	Bridge	N	N
Old County Courthouse - Museum	County Facility	N	N
CENTURY HIGH	Electric Power Plant	N	N
GERALD P. CARR INTERMEDIATE	Electric Power Plant	N	Y
HEBT IRVINE 1	Electric Power Plant	N	N
MCFADDEN INTERMEDIATE	Electric Power Plant	N	Y
SADDLEBACK HIGH	Electric Power Plant	N	Y
SEGERSTROM HIGH	Electric Power Plant	N	Y
TAFT ELEMENTARY	Electric Power Plant	N	Y
Orange County EMS	EMS Services	N	N
Orange County Fire Authority - Station 71	Fire Station	N	Y
Orange County Fire Authority - Station 72	Fire Station	N	N
Orange County Fire Authority - Station 73	Fire Station	N	Y
Orange County Fire Authority - Station 74	Fire Station	N	N
Orange County Fire Authority - Station 75	Fire Station	N	N
Orange County Fire Authority - Station 76	Fire Station	N	Y
Orange County Fire Authority - Station 77	Fire Station	N	Y
Orange County Fire Authority - Station 78	Fire Station	N	Y
Orange County Fire Authority - Station 79	Fire Station	N	N
Orange County Fire Authority-Station 70	Fire Station	N	N
Newport Bay Watershed - Portola Park Hydstra Flood Station	Flood Monitoring Station	N	N
Newport Bay Watershed - Santa Ana Engineering Hydstra Flood Station	Flood Monitoring Station	N	N

Name	Type	SFHA Exposure	
		1% Annual Chance Event	0.2% Annual Chance Event
Santa Ana River Watershed - Santiago Creek Santa Ana Hydstra Flood Station	Flood Monitoring Station	N	Y
Kindred Hospital Santa Ana	Hospital	N	Y
Central Men's & Women's Jails	Jail	N	Y
Administrative Office	Law Enforcement	N	N
Central Justice Center	Law Enforcement	N	Y
Central Justice Center	Law Enforcement	N	Y
Civil Complex Center	Law Enforcement	N	Y
Coroner Division	Law Enforcement	N	Y
District Attorney Headquarters	Law Enforcement	N	Y
North Operations	Law Enforcement	N	Y
OC Crime Lab	Law Enforcement	N	Y
Public Defender Headquarters	Law Enforcement	N	Y
Santa Ana Office	Law Enforcement	N	N
Youth Reporting Center - Central Region	Law Enforcement	N	N
County Branch Library - Orange County Public Library Administrative Headquarters	Library	N	N
17th Street Testing, Treatment, and Care Clinic	Medical Center	N	Y
OC Links	Medical Center	N	Y
Office of Vital Records, Custodian of Records and California Children Services	Medical Center	N	N
Orange County Global Medical Center	Medical Center	N	N
South Coast Global Medical Center	Medical Center	N	Y
ADVANCED REHAB CENTER OF TUSTIN	Nursing Home	N	N
COUNTRY VILLA PLAZA CONVALESCENT CENTER	Nursing Home	N	Y
FRENCH PARK CARE CENTER	Nursing Home	N	N
SOUTH COAST POST ACUTE	Nursing Home	N	Y
ST. EDNA SUBACUTE AND REHABILITATION CEN	Nursing Home	N	Y
THE HILLS POST ACUTE	Nursing Home	N	N
TOWN AND COUNTRY MANOR	Nursing Home	N	N
AMERICAN INSTITUTE OF MASSAGE THERAPY	Post-Secondary Education	N	N
COLLEEN O'HARAS BEAUTY ACADEMY	Post-Secondary Education	N	N
NORTH-WEST COLLEGE-ANAHEIM	Post-Secondary Education	N	N
RANCHO SANTIAGO COMMUNITY COLLEGE DISTRICT OFFICE	Post-Secondary Education	N	Y
SANTA ANA BEAUTY ACADEMY	Post-Secondary Education	N	N
SANTA ANA BEAUTY COLLEGE	Post-Secondary Education	N	Y
SANTA ANA COLLEGE	Post-Secondary Education	N	Y

Name	Type	SFHA Exposure	
		1% Annual Chance Event	0.2% Annual Chance Event
TRINITY LAW SCHOOL	Post-Secondary Education	N	N
Abraham Lincoln Elementary	Primary Education	N	Y
Adams Elementary	Primary Education	N	Y
Andrew Jackson Elementary	Primary Education	N	Y
Carl Harvey Elementary	Primary Education	N	Y
Diamond Elementary	Primary Education	N	Y
Edward B. Cole Academy	Primary Education	N	N
Edward Russell Elementary	Primary Education	N	Y
El Sol Santa Ana Science and Arts Academy	Primary Education	N	Y
Fairhaven Elementary	Primary Education	N	N
Franklin Elementary	Primary Education	N	N
Fremont Elementary	Primary Education	N	Y
Garfield Elementary	Primary Education	N	N
George Washington Carver Elementary	Primary Education	N	Y
Greenville Fundamental Elementary	Primary Education	N	Y
Heritage Elementary	Primary Education	N	Y
Heroes Elementary	Primary Education	N	Y
Jefferson Elementary	Primary Education	N	Y
Jim Thorpe Fundamental	Primary Education	N	Y
John F. Kennedy Elementary	Primary Education	N	N
John Muir Fundamental Elementary	Primary Education	N	N
Lowell Elementary	Primary Education	N	Y
Madison Elementary	Primary Education	N	N
Manuel Esqueda Elementary	Primary Education	N	N
Martin Elementary	Primary Education	N	Y
Martin Luther King Jr. Elementary	Primary Education	N	Y
Martin R. Heninger Elementary	Primary Education	N	N
McFadden Institute of Technology	Primary Education	N	Y
Monroe Elementary	Primary Education	N	N
Monte Vista Elementary	Primary Education	N	Y
Newhope Elementary	Primary Education	N	Y
Orange County Educational Arts Academy	Primary Education	N	N
Pio Pico Elementary	Primary Education	N	Y
R. F. Hazard Elementary	Primary Education	N	Y
Romero-Cruz Academy	Primary Education	N	Y
Roosevelt Walker Academy	Primary Education	N	N
Rosita Elementary	Primary Education	N	Y
Santiago Elementary	Primary Education	N	Y
Scholarship Prep - Orange County	Primary Education	N	Y
Sierra Preparatory Academy	Primary Education	N	N

Name	Type	SFHA Exposure	
		1% Annual Chance Event	0.2% Annual Chance Event
Taft Elementary	Primary Education	N	Y
Thomas A. Edison Elementary	Primary Education	N	N
Vista Condor Global Academy	Primary Education	N	Y
Wallace R. Davis Elementary	Primary Education	N	N
Washington Elementary	Primary Education	N	Y
Wilson Elementary	Primary Education	N	Y
County Administration North (CAN) - OC Development Services	Public Works	N	Y
OC Construction	Public Works	N	N
Public Works - City of Santa Ana	Public Works	N	Y
SANTA ANA	Rail Station (Commuter)	N	N
Advanced Learning Academy	Secondary Education	N	N
Century High	Secondary Education	N	N
Cesar E. Chavez High	Secondary Education	N	N
Citrus Springs Charter	Secondary Education	N	N
College and Career Preparatory Academy	Secondary Education	N	N
Douglas MacArthur Fundamental Intermediate	Secondary Education	N	Y
Ednovate - Legacy College Prep.	Secondary Education	N	N
Gerald P. Carr Intermediate	Secondary Education	N	Y
Gonzalo Felicitas Mendez Fundamental Intermediate	Secondary Education	N	Y
Hector G. Godinez	Secondary Education	N	Y
Julia C. Lathrop Intermediate	Secondary Education	N	N
Lorin Griset Academy	Secondary Education	N	Y
Magnolia Science Academy Santa Ana	Secondary Education	N	Y
Nova Academy Early College High	Secondary Education	N	Y
OCSA	Secondary Education	N	N
Raymond A. Villa Fundamental Intermediate	Secondary Education	N	N
REACH Academy	Secondary Education	N	Y
Saddleback High	Secondary Education	N	Y
Samueli Academy	Secondary Education	N	Y
Santa Ana High	Secondary Education	N	Y
Segerstrom High	Secondary Education	N	Y
Stephen R. Fitz Intermediate	Secondary Education	N	Y
Valley High	Secondary Education	N	Y
Vista Heritage Global Academy	Secondary Education	N	Y
Willard Intermediate	Secondary Education	N	Y
A C D INC	TRI Facility	N	N
ALMATRON ELECTRONICS INC	TRI Facility	N	N
ALUMINUM PRECISION PRODUCTS INC	TRI Facility	N	Y
ALUMINUM PRECISION PRODUCTS, INC	TRI Facility	N	N
AMREP INC	TRI Facility	N	Y

Name	Type	SFHA Exposure	
		1% Annual Chance Event	0.2% Annual Chance Event
ANODYNE INC	TRI Facility	N	Y
ANOMIL ENTS INCORPORATED DBA DANCO METAL SURFACING	TRI Facility	N	N
ARLON ADHESIVE SYSTEM/DECORATIVE FILMS	TRI Facility	N	Y
AXIOM MATERIALS, INC	TRI Facility	N	N
B P JOHN FURNITURE CO	TRI Facility	N	N
BAF INDUSTRIES	TRI Facility	N	Y
BARCEL/CDT INC	TRI Facility	N	Y
BEHR PROCESS CORP	TRI Facility	N	Y
BEHR PROCESS CORP	TRI Facility	N	Y
BEO-MAG PLATING	TRI Facility	N	Y
BP CHEMICALS HITCO INC MATERIALS FOCUSED FACTORY	TRI Facility	N	N
BRASS TECH INC	TRI Facility	N	N
BRASSTECH	TRI Facility	N	N
BRASSTECH, INC.	TRI Facility	N	N
BRAVO CORP	TRI Facility	N	Y
BREAK-FREE INC	TRI Facility	N	N
BURTIN CORPORATION	TRI Facility	N	N
CAL QUALITY ELECTRONICS	TRI Facility	N	Y
CELLTECH MANUFACTURING CA, INC.	TRI Facility	N	Y
CHERRY AEROSPACE	TRI Facility	N	N
CHROME TECH INC	TRI Facility	N	Y
CIBA GEIGY	TRI Facility	N	Y
COAST COMPOSITES INC	TRI Facility	N	N
CONAGRA INCORPORATED GILROY FOODS DBA	TRI Facility	N	Y
DATA ELECTRONICS SERVICES	TRI Facility	N	Y
DESA FMI LLC	TRI Facility	N	Y
DICEON ELECTRONICS INC	TRI Facility	N	N
DUPLEX PRODUCTS INC	TRI Facility	N	Y
ELECTRODE TECHNOLOGIES INC DBA REID METAL FINISHING	TRI Facility	N	Y
ELECTROMATIC INC	TRI Facility	N	N
ELPOWER CORP TECHNACELL DIV	TRI Facility	N	Y
EXPRESS MANUFACTURING INC	TRI Facility	N	Y
EXPRESS MANUFACTURING INC	TRI Facility	N	Y
FILBUR MFG LLC	TRI Facility	N	N
FOREMOST IN PACKAGING SYS., INC.	TRI Facility	N	N
FURON CO ACD SANTA ANA	TRI Facility	N	N
GALLADE CHEMICAL INC	TRI Facility	N	N
GE ENERGY & ENVIRONMENTAL RESEARCH CORP	TRI Facility	N	N
GEMINI IND INC	TRI Facility	N	N

Name	Type	SFHA Exposure	
		1% Annual Chance Event	0.2% Annual Chance Event
HOLLIDAY ROCK SANTA ANA 25	TRI Facility	N	N
HOOD MANUFACTURING INC	TRI Facility	N	N
HOUGHTON INTERNATIONAL INC	TRI Facility	N	Y
ITT CORPORATION	TRI Facility	N	N
JACUZZI WHIRLPOOL BATH	TRI Facility	N	Y
JASCO CHEM CORP INC	TRI Facility	N	N
KAGA USA INC	TRI Facility	N	Y
KERR	TRI Facility	N	N
LA PLATA ENTERPRISES - SDC	TRI Facility	N	N
LINE-X FRANCHISE DEVELOPMENT CORPORATION	TRI Facility	N	N
MALLINCKRODT MEDICAL INC	TRI Facility	N	Y
MARK WINDOW PRODUCTS	TRI Facility	N	Y
MARKLAND MANUFACTURING INC	TRI Facility	N	N
MASK TECHNOLOGIES INC	TRI Facility	N	N
MEDITERRANEAN YATCH CORP INT'	TRI Facility	N	Y
MICROSEMI CORP	TRI Facility	N	Y
NEWPORT ELECTRONICS INC	TRI Facility	N	Y
NEWPORT LAMINATES	TRI Facility	N	Y
O C ALPHANETICS INC	TRI Facility	N	Y
ORCHID ORTHOPEDICS SOLUTIONS	TRI Facility	N	Y
PACIFIC CIRCUIT SERVICES INC	TRI Facility	N	N
PERFORMANCE CATAMARANS INC	TRI Facility	N	N
PLEION CORP	TRI Facility	N	N
POLYCLAD LAMINATES INC	TRI Facility	N	Y
POLYCLAD LAMINATES, INC.	TRI Facility	N	N
PONDEROSA FIBRES OF AMERICA BJ FIBRES DIV	TRI Facility	N	N
QUALTECH BACKPLANE INC.	TRI Facility	N	Y
RBC TRANSPORT DYNAMICS CORP	TRI Facility	N	Y
ROBERTSON'S READY MIX SANTA ANA PLANT 17	TRI Facility	N	Y
SANTA ANA PLATING INC	TRI Facility	N	N
SHERWOOD SHUTTER CORP	TRI Facility	N	Y
SOLDER STATION ONE INC	TRI Facility	N	Y
SOUTH COAST CIRCUITS, INC.	TRI Facility	N	Y
SPARKLETTS DRINKING WATER CORP	TRI Facility	N	Y
SPECIALTY PACKAGING CO INC	TRI Facility	Y	Y
STREMICKS HERITAGE FOODS LLC	TRI Facility	Y	Y
TRAIL RITE INC	TRI Facility	N	Y
TRIG AEROSPACE	TRI Facility	N	N
TRIUMPH PROCESSING, EMBEE DIV, INC.	TRI Facility	N	N
TROY SYSTEMS INC	TRI Facility	N	N
TTM TECHNOLOGIES INC	TRI Facility	N	Y

Name	Type	SFHA Exposure	
		1% Annual Chance Event	0.2% Annual Chance Event
UNIVERSAL CIRCUITS, INC.	TRI Facility	N	Y
URETHANE TECH INC	TRI Facility	N	N
WHEEL SERVICES GROUP, INC.	TRI Facility	N	N
WR GRACE & CO CONN CONSTRUCTION PRODUCTS DIV	TRI Facility	N	N

Source: California Department of Education 2024; Caltrans 2024; HIFLD 2022, 2023, 2024; Orange County 2022, Orange County Sheriff's Department 2024; U.S. Geological Survey 2024; USACE 2024
Note: N = Facility is NOT exposed to the SFHA Zone (1% / 0.2%); Y = Facility IS exposed to the SFHA Zone (1% / 0.2%).

Dam Hazard Vulnerability

The U.S. Army Corps of Engineers (USACE) operates and maintains approximately 740 dams across the United States, providing benefits such as flood risk management, water supply, hydropower, and environmental stewardship (USACE 2021). USACE classifies its dams into five Dam Safety Action Classes (DSAC), ranging from DSAC I (highest risk) to DSAC V (lowest risk), based on factors like event probability, probability of failure, and potential consequences (USACE 2010). This risk-informed approach ensures that dam safety decisions prioritize life safety and effective resource allocation (USACE 2021). Refer to Table 6-17 for the USACE dams located in the City of Santa Ana.

Table 6-17. USACE Dams and Population in Dam Inundation Area for City of Santa Ana

Dam Name	Total Population (2020 Decennial)	Estimated Number of People Located in Dam Inundation Area	Estimated Percent Total of People Located in Dam Inundation Area
Brea Dam	310,227	0	0.0%
Carbon Canyon Dam	310,227	0	0.0%
Fullerton Dam	310,227	0	0.0%
Prado Dam	310,227	178,188	57.4%
Whittier Dam	310,227	0	0.0%

Source: U.S. Census Bureau 2020; USACE 2024

The California Division of Safety of Dams (DSOD) oversees the design, construction, and maintenance of over 1,200 jurisdictional-sized dams in California (CA DWR 2025). Established in 1929, DSOD ensures dam safety by conducting annual inspections, reviewing structural and hydrological analyses, and approving modifications to existing dams. Dams are classified based on their downstream hazard potential, which ranges from high to low, reflecting the potential impact on life and property in the event of a failure (CA Office of Emergency Services GIS 2020). This classification system helps prioritize safety measures and resource allocation to protect communities and infrastructure. Refer to Table 6-18 for the CA DSOD dams located in the City of Santa Ana.

Table 6-18. CA DSOD Dams and Population in Dam Inundation Area for City of Santa Ana

Dam Name	Total Population (2020 Decennial)	Estimated Number of People Located in Dam Inundation Area	Estimated Percent Total of People Located in Dam Inundation Area
Big Canyon Dam	310,227	0	0.0%
Diemer Dam	310,227	0	0.0%
Deimer No.8 Dam	310,227	0	0.0%
Deimer Ozone Dam	310,227	0	0.0%
Dove Canyon Dam	310,227	0	0.0%
Harbor View Dam	310,227	0	0.0%
Mission Viejo Dam	310,227	0	0.0%
Lower Peters Canyon Dam	310,227	0	0.0%
Peters Canyon Dam	310,227	0	0.0%
Portola Dam	310,227	0	0.0%
Rattlesnake Dam	310,227	0	0.0%
Rossmoor Dam	310,227	0	0.0%
San Joaquin Dam	310,227	0	0.0%
Sand Canyon	310,227	0	0.0%
Santiago Dam	310,227	185,830	59.9%
Sulphur Creek Dam	310,227	0	0.0%
Syphon Dam	310,227	0	0.0%
Trampas Dam	310,227	0	0.0%
Upper Chiquita Dam	310,227	0	0.0%
Upper Oso Dam	310,227	0	0.0%
Villa Park Dam	310,227	31,460	10.1%
Walnut Dam	310,227	0	0.0%
Yorba Dam	310,227	0	0.0%

Source: U.S. Census Bureau 2020; State of California - Department of Water Resources, Division of Safety of Dams 2024

6.6.4 Identified Issues

After review of the City of Santa Ana hazard event history, hazard rankings, hazard location, and current capabilities, the City identified the following vulnerabilities within the community:

- Major disaster events can result in large amounts of debris that overwhelm normal trash collection operations. Depending on the amount generated, temporary staging areas for debris collection may be needed. The municipality does not have a disaster debris management plan in place. During a disaster that results in debris, a plan with outlined responsibilities is needed to adequately address post-disaster cleanup operations.
- The City does not have a post disaster response action plan.
- It has been discussed in planning meetings that the Santa Ana River will overtop its banks in parts of Santa Ana if the river flows reach 8,000 cubic feet per second. The City can estimate where that would occur, but have never been able to find an inundation map or how far the inundation would spread and how deep it would be; all of which the City needs to know for evacuations, sandbagging, etc. Presumably

if the river reached 10,000 or 12,000 cubic feet per second there would be overtopping in additional locations, and the flooding would reach further and deeper into the City.

- The City does not participate in the CRS Program, to date. Subsequently, the City does not have a designated CRS Coordinator on staff.
- The City's storm drain system is generally undersized and causes flooding during high intensity storms.

6.7 MITIGATION STRATEGY AND PRIORITIZATION

The City of Santa Ana participated in the mitigation strategy workshop for this FMP to identify appropriate actions to include in a mitigation action catalogue. Its comprehensive consideration of all possible activities to address flood-related hazards of concern included review of the six CRS action categories:

- **Property Protection (PP)** -These actions include public activities to reduce hazard losses or actions that involve (1) modification of existing buildings or structures to protect them from a flood hazard or (2) removal of structures from the flood hazard area.
- **Preventative Measures (PR)** - Government, administrative, or regulatory actions, or processes that influence the way land and buildings are developed and built. Examples include planning and zoning, capital improvement plans, etc.
- **Public Information (PI)** - Actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them.
- **Natural Resource Protection (NPR)** - Actions that minimize flood hazard loss and preserve or restore the functions of natural systems.
- **Structural Flood Control Project (SP)** - Actions that involve the construction of structures to reduce the impact of a flood hazard. Such structures include dams, setback levees, floodwalls, retaining walls, and safe rooms.
- **Emergency Services (ES)** - Actions that protect people and property during and immediately following a disaster or flood related hazard event. Services include warning systems, emergency response services, and the protection of essential facilities.

Action summary information is provided in Table 6-19. Volume I identifies 14 evaluation criteria for prioritizing the mitigation actions. To assist with rating each mitigation action as high, medium, or low priority, a numeric rank is assigned (-1, 0, or 1) for each of the evaluation criteria. Table 6-20 provides a summary of the prioritization of all proposed mitigation actions for the FMP.

Table 6-19. Mitigation Action Summary

Project Number	Project Name	Flood Hazard	Responsible Party	Brief Summary of the Problem and the Solution (Project)	CRS Category
2025-SantaAna-FMP1	Disaster Debris Management Plan	All Natural Hazards	Public Works	Major disaster events can result in large amounts of debris that overwhelm normal trash collection operations. Depending on the amount generated, temporary staging areas for debris collection may be needed. The municipality does not have a disaster debris management plan in place. During a disaster that results in debris, a plan with outlined responsibilities is needed to adequately address post-disaster cleanup operations. The municipality will develop a disaster debris management plan. This plan will establish procedures and guidelines for managing disaster debris in a coordinated, environmentally responsible, and cost-effective manner. The plan will identify responsibilities for execution of the plan. The plan will align with permitted temporary collection areas.	ES
2025-SantaAna-FMP2	Post Disaster Response Action Plan	All Natural Hazards	Public Works	The City does not have a post disaster response action plan. The municipality will develop a disaster debris management plan. This plan will establish procedures and guidelines for managing disaster debris in a coordinated, environmentally responsible, and cost-effective manner. The plan will identify responsibilities for execution of the plan. The plan will align with permitted temporary collection areas.	ES
2025-SantaAna-FMP3	Santa Ana River Inundation Mapping	Riverine Flooding	Engineering Department and Public Works Department: USACE and FEMA	It has been discussed in planning meetings that the Santa Ana River will overtop its banks in parts of Santa Ana if the river flows reach 8,000 cubic feet per second. The City can estimate where that would occur, but have never been able to find an inundation map or how far the inundation would spread and how deep it would be; all of which the City needs to know for evacuations, sandbagging, etc. Presumably if the river reached 10,000 or 12,000 cubic feet per second there would be overtopping in additional locations, and the flooding would reach further and deeper into the City. The City departments will reach out to USACE and FEMA region to discuss possible riverine flooding inundation mapping efforts for the Santa Ana River. Once the project is detailed and funding is secured, the City departments will assist USACE and/or FEMA as they lead these efforts.	PP
2025-SantaAna-FMP4	Establish a CRS Coordinator	All Natural Hazards	Public Works Department	The City does not participate in the CRS Program, to date. Subsequently, the City does not have a designated CRS Coordinator on staff. The City public works department will explore the feasibility of the City joining the CRS Program. The City will then appoint a CRS Coordinator who will lead the CRS efforts for the City.	PR

Project Number	Project Name	Flood Hazard	Responsible Party	Brief Summary of the Problem and the Solution (Project)	CRS Category
2025-SantaAna-FMP5	Rousselle Street Flood Protection Project	Riverine Flooding	Public Works Department	The City's storm drain system is generally undersized and causes flooding during high intensity storms. The City is currently implementing the Rousselle Street Flood Protection Project. The Project includes the upgrade of approximately 1,300 linear-feet of existing 51" storm drain to a 7' x 8' reinforced concrete box storm drain along Rousselle Street, from Warner Avenue to St Gertrude Place. This project is part of a Top 10 recommended capital project in the City's 2018 Storm drain Master Plan.	SP

Table 6-20. Summary of Prioritization of Actions

Project Number	Project Name	Scores for Evaluation Criteria															High / Medium / Low
		Life Safety	Property Protection	Cost-Effectiveness	Political	Legal	Fiscal	Environmental	Social Vulnerability	Administrative	Hazards of Concern	Climate Change	Timeline	Community Lifelines	Other Local Objectives	Total	
2025-SantaAna-FMP1	Disaster Debris Management Plan	1	1	1	1	1	1	0	1	1	1	1	0	1	1	12	High
2025-SantaAna-FMP2	Post Disaster Response Action Plan	1	1	1	1	1	1	0	1	1	1	1	0	1	1	12	High
2025-SantaAna-FMP3	Santa Ana River Inundation Mapping	1	1	1	1	1	0	1	1	1	1	1	1	1	1	13	High
2025-SantaAna-FMP4	Establish a CRS Coordinator	1	1	1	1	1	0	0	1	1	1	1	1	1	1	12	High
2025-SantaAna-FMP5	Rousselle Street Flood Protection Project	1	1	1	1	1	1	1	1	0	1	1	1	1	1	13	High

Note: Volume I, Section 6 (Mitigation Strategy) conveys guidance on prioritizing mitigation actions. Low (0-6), Medium (7-10), High (11-14).

Action 2025-SantaAna-FMP1. Disaster Debris Management Plan

Lead Agency:	Public Works
Supporting Agency	-
Hazard(s) of Concern:	All Natural Hazards
Description of the Problem:	Major disaster events can result in large amounts of debris that overwhelm normal trash collection operations. Depending on the amount generated, temporary staging areas for debris collection may be needed. The municipality does not have a disaster debris management plan in place. During a disaster that results in debris, a plan with outlined responsibilities is needed to adequately address post-disaster cleanup operations.
Description of the Solution:	The municipality will develop a disaster debris management plan. This plan will establish procedures and guidelines for managing disaster debris in a coordinated, environmentally responsible, and cost-effective manner. The plan will identify responsibilities for execution of the plan. The plan will align with permitted temporary collection areas.
Estimated Cost:	Staff time
Potential Funding Source:	Municipal budget
Implementation Timeline:	Short-term (< 5 years); ongoing updates
Benefits:	High ($100,000)
CRS Category	Emergency Services
Priority	High

Action 2025-SantaAna-FMP2. Post Disaster Response Action Plan

Lead Agency:	Public Works
Supporting Agency	-
Hazard(s) of Concern:	All Natural Hazards
Description of the Problem:	The City does not have a post disaster response action plan.
Description of the Solution:	The City Public Works will coordinate with other agencies on developing a post disaster response action plan. Other agencies included will b ethe Fire Department, Police Department, first responders, and other emergency responders.
Estimated Cost:	Staff time
Potential Funding Source:	Municipal budget
Implementation Timeline:	Short-term (< 5 years); ongoing updates
Benefits:	High ($100,000)
CRS Category	Emergency Services
Priority	High

Action 2025-SantaAna-FMP3. Santa Ana River Inundation Mapping

Lead Agency:	Engineering Department and Public Works Department
Supporting Agency	USACE and FEMA
Hazard(s) of Concern:	Riverine Flooding
Description of the Problem:	It has been discussed in planning meetings that the Santa Ana River will overtop its banks in parts of Santa Ana if the river flows reach 8,000 cubic feet per second. The City can estimate where that would occur, but have never been able to find an inundation map or how far the inundation would spread and how deep it would be; all of which the City needs to know for evacuations, sandbagging, etc. Presumably if the river reached 10,000 or 12,000 cubic feet per second there would be overtopping in additional locations, and the flooding would reach further and deeper into the City.
Description of the Solution:	The City departments will reach out to USACE and FEMA region to discuss possible riverine flooding inundation mapping efforts for the Santa Ana River. Once the project is detailed and funding is secured, the City departments will assist USACE and/or FEMA as they lead these efforts.
Estimated Cost:	TBD
Potential Funding Source:	USACE, FMA, HMGP, Other FEMA
Implementation Timeline:	TBD
Benefits:	High ($100,000)
CRS Category	Property Protection
Priority	High

Action 2025-SantaAna-FMP4. Establish a CRS Coordinator

Lead Agency:	Public Works Department
Supporting Agency	-
Hazard(s) of Concern:	All Natural Hazards
Description of the Problem:	The City does not participate in the CRS Program, to date. Subsequently, the City does not have a designated CRS Coordinator on staff.
Description of the Solution:	The City public works department will explore the feasibility of the City joining the CRS Program. The City will then appoint a CRS Coordinator who will lead the CRS efforts for the City.
Estimated Cost:	Staff Time
Potential Funding Source:	Municipal Budget
Implementation Timeline:	Short-term (< 5 years); ongoing updates
Benefits:	High ($100,000)
CRS Category	Preventative Measures
Priority	High

Action 2025-SantaAna-FMP5. Rousselle Street Flood Protection Project

Lead Agency:	Public Works Department
Supporting Agency	-
Hazard(s) of Concern:	Riverine Flood
Description of the Problem:	The City's storm drain system is generally undersized and causes flooding during high intensity storms.
Description of the Solution:	The City is currently implementing the Rousselle Street Flood Protection Project. The Project includes the upgrade of approximately 1,300 linear-feet of existing 51" storm drain to a 7' x 8' reinforced concrete box storm drain along Rousselle Street, from Warner Avenue to St Gertrude Place. This project is part of a Top 10 recommended capital project in the City's 2018 Storm drain Master Plan.
Estimated Cost:	Staff Time
Potential Funding Source:	Municipal Budget
Implementation Timeline:	Short-term (< 5 years)
Benefits:	High ($100,000)
CRS Category	Structural Flood Control Project
Priority	High

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APPENDIX A. ACRONYMS AND ABBREVIATIONS

This resource identifies the acronyms and abbreviations used in the Floodplain Management Plan.

BRIC—Building Resilient Infrastructure and Communities

CA DWR—California Department of Water Resources

CDBG—Community Development Block Grant

CDBG-DR—Community Development Block Grant—Disaster Recovery

CIP—Capital Improvement Program

CRS—Community Rating System

DR—Major Disaster Declaration (FEMA)

DSOD—Division of Safety of Dams (CA DWR)

EM—Emergency Declaration (FEMA)

EMS—Emergency Medical Services

EOP—Emergency Operations Plan

ES—Emergency Services

FEMA—Federal Emergency Management Agency

FIRM—Flood Insurance Rate Map

FMA—Flood Mitigation Assistance

FMP—Floodplain Management Plan

GIS—Geographic Information System

HMA—Hazard Mitigation Assistance

HMGP—Hazard Mitigation Grant Program

ISO—Insurance Services Office

NAVD—North American Vertical Datum of 1988

NFIP—National Flood Insurance Program

NOAA—National Oceanic and Atmospheric Administration

NRP—Natural Resources Protection

NWS—National Weather Service

OCFCD—Orange County Flood Control District

OCPW—Orange County Department of Public Works

PDM—Pre-Disaster Mitigation Program

PP—Property Protection

PI—Public Information/Outreach

PR—Preventive Measures

RL—Repetitive Loss

SFHA —Special Flood Hazard Area

SP—Structural Projects

USACE—U.S. Army Corps of Engineers

APPENDIX B. GLOSSARY

0.2% flood—A flood that has a 0.2-percent chance of being equaled or exceeded in any one year.

1% flood (100-year flood)—A flood that has a 1-percent chance of being equaled or exceeded in any given year. This flood event is also referred to as the base flood. The term “100-year flood” can be misleading; it is not the flood that will occur once every 100 years. Rather, it is the flood elevation that has a 1- percent chance of being equaled or exceeded each year. Therefore, the 100-year flood could occur more than once in a relatively short period of time. The 100-year flood, which is the standard used by most federal and state agencies, is used by the National Flood Insurance Program (NFIP) as the standard for floodplain management to determine the need for flood insurance.

Asset—Any man-made or natural feature that has value, including but not limited to people, buildings, infrastructure (such as bridges, roads, and sewer and water systems), and lifelines (such as electricity and communication resources or environmental, cultural, or recreational features like parks, dunes, wetlands, or landmarks).

Benefit—Net project outcomes, usually defined in monetary terms. Benefits may include direct and indirect effects. For the purposes of conducting a benefit-cost analysis of proposed mitigation measures, benefits are limited to specific, measurable, risk reduction factors, including a reduction in expected property losses (building, content, and function) and protection of human life.

Building Code—Regulations that set forth standards and requirements for construction, maintenance, operation, occupancy, use, or appearance of buildings, premises, and dwelling units. Building codes can include standards for structures to withstand natural disasters.

Capability Assessment—An assessment that provides a description and analysis of a community or state’s current capacity to address the threats associated with hazards. The capability assessment attempts to identify and evaluate existing policies, regulations, programs, and practices that positively or negatively affect the community or state’s vulnerability to hazards or specific threats.

Community Lifeline—A subset of critical facilities that are fundamental services and systems that support a community’s ability to survive and recover from disasters. A lifeline enables the continuous operation of critical business and government functions and is essential to human health and safety or economic security.

Community Rating System (CRS)—CRS is a program that provides incentives for National Flood Insurance Program communities to complete activities that reduce flood hazard risk. When the community completes specific activities, the insurance premiums of these policyholders in communities are reduced.

Critical Facility—Facilities that are critical to the health and welfare of the population and that are especially important following a hazard.

Debris—The scattered remains of assets broken or destroyed during the occurrence of a hazard. Debris caused by a wind or water hazard event can cause additional damage to other assets.

Exposure—The number and dollar value of assets that are considered to be at risk during the occurrence of a specific hazard.

Extent—The severity of a hazard event, typically based on a quantitative measure of hazard conditions (e.g., flood depth or floodwater flow velocity).

Flash Flood—A flood occurring with little or no warning where water levels rise at an extremely fast rate.

Flood—A general and temporary condition of partial or complete inundation of normally dry land areas resulting from (1) the overflow of inland or tidal waters, (2) the unusual and rapid accumulation or runoff of surface waters from any source, or (3) mudflows or the sudden collapse of shoreline land.

Flood Elevation—Height of the water surface above an established datum (for example, the National Geodetic Vertical Datum of 1929, North American Vertical Datum of 1988, or mean sea level).

Flood Insurance Rate Map (FIRM)—Map of a community, prepared by the FEMA that shows both the special flood hazard areas and the risk premium zones applicable to the community.

Flood Mitigation Assistance (FMA) Program—A program created as a part of the National Flood Insurance Report Act of 1994. FMA provides funding to assist communities and states in implementing actions that reduce or eliminate the long-term risk of flood damage to buildings, manufactured homes, and other NFIP insurance structures, with a focus on repetitive loss properties.

Floodplain—Any land area, including a watercourse, susceptible to partial or complete inundation by water from any source.

Floodplain Management—A community-based effort to prevent or reduce the risk of flooding, resulting in a more resilient community.

Frequency—A measure of how often events of a particular magnitude are expected to occur. Frequency describes how often a hazard of a specific magnitude, duration, and/or extent typically occurs, on average. Statistically, a hazard with a 100-year recurrence interval is expected to occur once every 100 years on average and would have a 1-percent chance of happening in any given year. The reliability of this information varies depending on the kind of hazard being considered.

Hazard Mitigation—Sustained actions taken to reduce or eliminate the long-term risk and effects that can result from the occurrence of a specific hazard. For example, building a retaining wall can protect an area from flooding.

Hazard Mitigation Plan—A collaborative document in which hazards affecting the community are identified, vulnerability to hazards assessed, and consensus reached on how to minimize or eliminate the effects of these hazards.

Hazard Profile—A description of the physical characteristics of a hazard, including a determination of various descriptors including magnitude, duration, frequency, probability, and extent. In most cases, a community can most easily use these descriptors when they are recorded and displayed as maps.

Hazus—A GIS-based nationally standardized earthquake, flood, and wind loss estimation tool developed by FEMA.

Infrastructure—The public services of a community that have a direct impact on the quality of life. Infrastructure includes communication technology such as phone lines or Internet access, vital services such as public water supplies and sewer treatment facilities, transportation system (such as airports, heliports; highways, bridges,

tunnels, roadbeds, overpasses, railways, bridges, rail yards, depots; and waterways, canals, locks, seaports, ferries, harbors, dry docks, piers and regional dams).

Inventory—The assets identified in a study region. It includes assets that can be lost when a disaster occurs and community resources are at risk. Assets include people, buildings, transportation, and other valued community resources.

Magnitude—A measure of the strength of a hazard occurrence. The magnitude (also referred to as severity) of a given hazard occurrence is usually determined using technical measures specific to the hazard. For example, ranges of wind speeds are used to categorize tornados.

Major Disaster Declarations—Post-disaster status requested by a state's governor when local and state resources are not sufficient to meet disaster needs. It is based on the damage assessment, and an agreement to commit state funds and resources to the long-term recovery. The event must be clearly more than the state or local government can handle alone.

Mitigation Actions—Specific actions that help you achieve your goals and objectives.

National Flood Insurance Program (NFIP)—Federal program created by Congress in 1968 that makes flood insurance available in communities that enact minimum floodplain management regulations in 44 Code of Federal Regulations §60.3.

Post-disaster mitigation—Mitigation actions taken after a disaster has occurred, usually during recovery and reconstruction.

Preparedness—Actions that strengthen the capability of government, citizens, and communities to respond to disasters.

Recovery—The actions taken by an individual or community after a catastrophic event to restore order and lifelines in the community.

Repetitive Loss Property—A property that is currently NFIP insured for which two or more flood insurance claims (occurring more than 10 days apart) of more than $1,000 each have been paid by the NFIP within any 10-year period since 1978.

Risk—The estimated impact that a hazard would have on people, services, facilities, and structures in a community; the likelihood of a hazard occurring and resulting in an adverse condition that causes injury or damage. Risk is often expressed in relative terms such as a high, moderate or low likelihood of sustaining damage above a particular threshold due to occurrence of a specific type of hazard. Risk also can be expressed in terms of potential monetary losses associated with the intensity of the hazard.

Risk Assessment—A methodology used to assess potential exposure and estimated losses associated with priority hazards. The risk assessment process includes four steps: (1) identifying hazards, (2) profiling hazards, (3) conducting an inventory of assets, and (4) estimating losses.

Riverine—Of or produced by a river (for example, a riverine flood is one that is caused by a river overflowing its banks).

Severe Repetitive Loss Property— structure that is currently insured by an NFIP policy that has incurred flood-related damage for which four or more separate claims payments have been made, with the amount of each claim

(including building and contents payments) exceeding $5,000, and with the cumulative amount of such claims payments exceeding $20,000; or For which at least two separate claims payments (building payments only) have been made under such coverage, with the cumulative amount of such claims exceeding the market value of the building.

Social Vulnerability—Social vulnerability is the susceptibility of social groups to the adverse impacts of natural hazards, including disproportionate death, injury, loss, or disruption of livelihood.

Special Flood Hazard Area (SFHA)—An area within a floodplain having a 1-percent or greater chance of flood occurrence in any given year (that is, the 100-year or base flood zone); represented on FIRMs as darkly shaded areas with zone designations that include the letter “A” or “V.”

Stakeholder—Stakeholders are individuals or groups, including businesses, private organizations, and citizens, that will be affected in any way by an action or policy.

Substantial Damage—Damage of any origin sustained by a structure in a SFHA, for which the cost of restoring the structure to its pre-hazard event condition would equal or exceed 50 percent of its pre-hazard event market value.

Vulnerability—Description of how exposed or susceptible an asset is to damage. This value depends on an asset’s construction, contents, and the economic value of its functions. Like indirect damages, the vulnerability of one element of the community is often related to the vulnerability of another. For example, many businesses depend on uninterrupted electrical power. If an electric substation is flooded, it will affect not only the substation itself, but a number of businesses as well. Often, indirect affects can be much more widespread and damaging than direct affects.

Watershed—Area of land that drains down gradient (from areas of higher land to areas of lower land) to the lowest point; a common drainage basin. The water moves through a network of drainage pathways, both underground and on the surface. Generally, these pathways converge into streams and rivers, which become progressively larger as the water moves downstream, eventually reaching an estuary, lake, or ocean.

Zoning Ordinance—Designation of allowable land use and intensities for a local jurisdiction. Zoning ordinances consist of two components: a zoning text and a zoning map.