2024

LOCAL HAZARD MITIGATION PLAN

Prepared by: Mark D. Annas

City of Riverside ANNEX – Pending Approval

8/29/2024

CITY OF RIVERSIDE - ANNEX
LOCAL HAZARD MITIGATION PLAN
2023

CONTACT INFORMATION

CITY OF RIVERSIDE

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EXECUTIVE SUMMARY

Hazard Mitigation Overview

The purpose of the City of Riverside Local Hazard Mitigation Plan is to evaluate and assess the identified hazards posed to the city, and review and assess past disaster occurrences. Hazard mitigation is the use of long-term and short-term policies, programs, projects, and other activities to minimize the loss of life, injury, and property damage that can result from a disaster. The City of Riverside has developed a local hazard mitigation plan to reduce risks from disasters to the people, property, economy, and environment within the city. The plan complies with federal and state hazard mitigation planning requirements to establish eligibility for funding under Federal Emergency Management Agency (FEMA) grant programs.

Plan Development Approach

The Riverside Fire Department – Office of Emergency Management coordinated the update to the City of Riverside LHMP for the year 2023 to address planning considerations unique to the City of Riverside.

This plan update was prepared pursuant to the requirements of the Disaster Mitigation Act of 2000 to achieve eligibility and potentially secure mitigation funding through Federal Emergency Management Agency (FEMA) Flood Mitigation Assistance, Pre-Disaster Mitigation, and Hazard Mitigation Grant Programs.

The City of Riverside LHMP integrates with the Riverside County Operational Area Multi-Jurisdictional Hazard Mitigation Plan and provides a uniform approach to community mitigation efforts.

The planning process followed a methodology presented by FEMA and Cal OES which included conducting meetings coordinated by Riverside Fire Department – Office of Emergency Management along with our partners at Riverside County Emergency Management Department. These meetings were comprised of participating Federal, State and local jurisdictions, departments, agencies, special districts, school districts, non-profit communities, universities, businesses and public entities.

The plan identifies vulnerabilities, provides recommendations for prioritized mitigation actions, evaluates resources and identifies mitigation shortcomings, provides future mitigation planning and maintenance of the existing plan.

The plan is implemented upon FEMA approval, and adoption by Riverside City Council.

PLAN ADOPTION/ RESOLUTION

The City of Riverside will submit plans to Riverside County Emergency Management Department who will forward to California Governor's Office of Emergency Services (CAL OES) for review prior to being submitted to the Federal Emergency Management Agency (FEMA). In addition, we will wait to receive an "Approval Pending Adoption" letter from FEMA before taking the plan to our local governing bodies for adoption. Upon approval, the City of Riverside will insert the signed resolution as an attachment.

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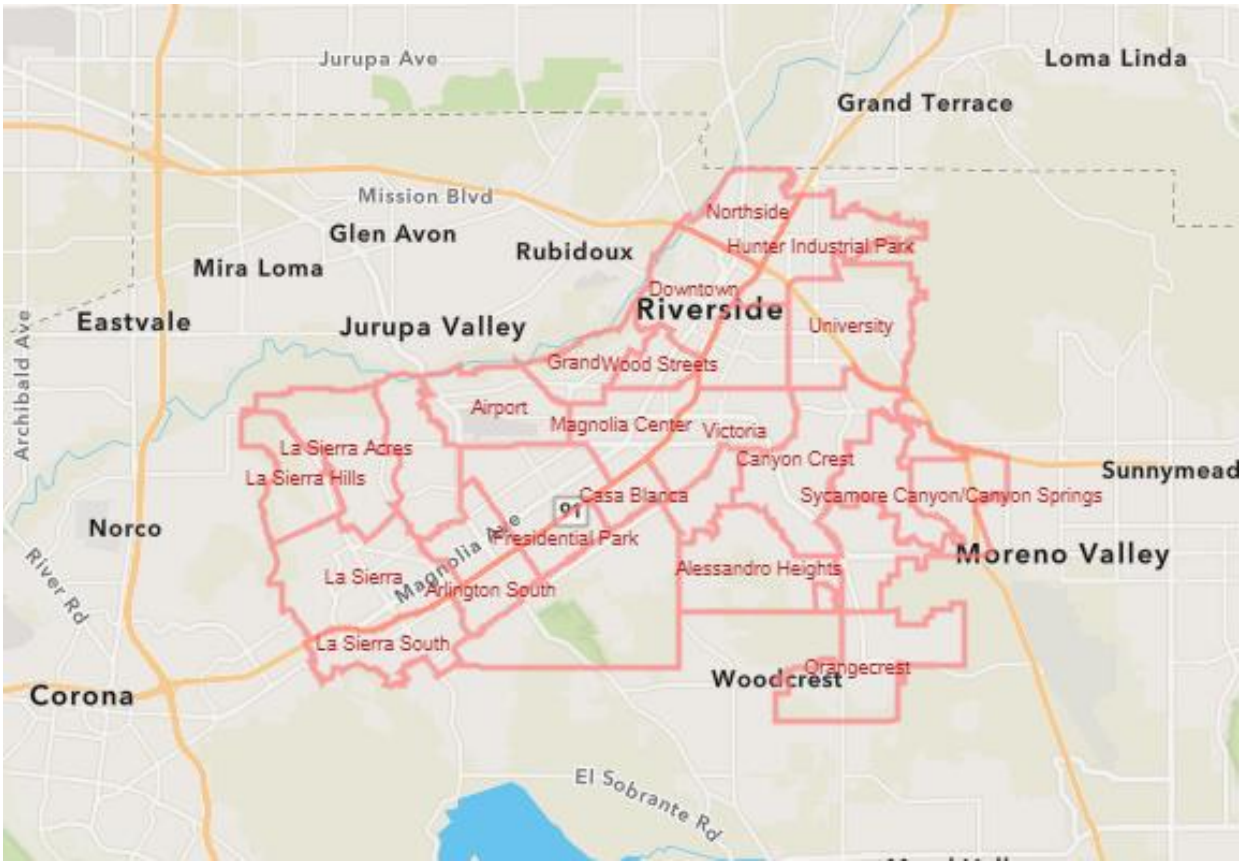
SECTION 1.0 - COMMUNITY PROFILE

1.1 CITY MAP



1.2 GEOGRAPHY AND CLIMATE DESCRIPTION

The City of Riverside is located in Riverside County, California, and is the county seat. Named for its location beside the Santa Ana River, it is located at the center of the Inland Empire and is the largest city in the Riverside-San Bernardino-Ontario metropolitan area of Southern California, the 4th largest inland California City and is located approximately 60 miles (97 km) east of Los Angeles. Riverside is the 61st most populous city in the United States and the 12th most populous city in California. The City of Riverside is currently 81 square miles. According to the California Department of Finance, Riverside has a 2021 estimated population of 317,261.

The City of Riverside sits in a valley surrounded by small mountain areas as well as large mountain ranges such as the San Jacinto and San Bernardino mountains. Within the City, surface elevations range from 700 feet above sea level near the Santa Ana River to

over 1,400 feet west of La Sierra Avenue. The highest point in the city is Mt. Rubidoux, standing 1,331. The city's downtown elevation is 860 feet.

The County seat for the County of Riverside is in the City of Riverside, along with numerous state and federal facilities. Riverside is situated along two major freeway systems; both freeways bisect the city. Along the northern edge of the city runs Highway 60 and is considered a primary east-west freeway link flowing traffic and goods westward to the Los Angeles metropolitan area and easterly to the Arizona border and beyond. The 91/215 freeway traverses the center portion of the city and is a primary north and south route for traffic and goods connecting Los Angeles metropolitan area to Las Vegas, Salt Lake City and beyond.

Major railway freight and passenger traffic follows the 91/215 freeway through the city leading from the Ports of Los Angeles and Long Beach to the San Bernardino/Colton rail yards, where the railcars are re-assembled for connections to northern and eastern portions of the country.

The City of Riverside is home to four large college campuses: University of California at Riverside, California Baptist University, La Sierra University and Riverside Community College. With the exception of Riverside Community College, each of these campuses houses students throughout the academic year. The University of California at Riverside, an important agricultural, research, and engineering university, attracts students from throughout the world. K-12 education is provided by two school districts, Riverside Unified and Alvord Unified, with a total of (40) elementary schools, (11) middle schools, and (12) high schools. In addition, the Riverside County Office of Education is headquartered in Riverside and supports (1) regional learning center, (7) Head Start Programs, (2) School of Career Education sites, as well as providing education at: (1) community school, (6) Welcome Back Kids Programs; and (2) Detention Centers within the city limits. There are also several private schools including Sherman Indian High School (houses students throughout the academic year) and the California School for the Deaf.

Other attractions in Riverside include the Fox Performing Arts Center, Riverside Metropolitan Museum, which houses exhibits and artifacts of local history, the California Museum of Photography, the California Citrus State Historic Park, and the Parent Washington Navel Orange Tree, one of the two original orange trees in California.

The City of Riverside is served by three major hospitals (Kaiser, Riverside Community, and Parkview Community).

The City of Riverside experiences a semi-arid or an arid Mediterranean climate with hot, dry summers and mild, relatively wet winters. Temperatures in the summer can exceed 95°F (35°C) but with low humidity. In the winter, high temperatures may not rise above 55°F (13°C) during rainy days. On average, January is the coldest month with an average high/low of 68°F/43°F (20°C/6°C) while August is the hottest with a high/low of 95°F/64°F (35°C/18°C). Riverside receives 10.22" of precipitation annually with most of it occurring in the winter and early spring, especially January through March, with January and February being the wettest months. However, during El Nino years, Southern California can receive considerably more precipitation and cooler temperatures than average.

Figure 1.2.1 – Table – Climate Data for City of Riverside

Climate Riverside - California

	Jan	Feb	Mar	Apr	May	Jun
Average high in °F	68	68	71	76	80	87
Average low in °F	43	44	46	49	54	57
Av. precipitation in inch	2.33	2.42	1.69	0.68	0.20	0.09

	Jul	Aug	Sep	Oct	Nov	Dec
Average high in °F	94	95	91	83	74	67
Average low in °F	62	62	59	53	46	42
Av. precipitation in inch	0.04	0.09	0.16	0.46	0.81	1.37

Source: https://www.usclimatedata.com/climate/riverside/california/united-states/usca1695

1.3 CITY OF RIVERSIDE HISTORY

On March 20, 1774, Juan Bautista De Anza, leading an exploratory expedition to find a good land route from southern Mexico to Alta California, reached what is today known as Riverside.

Riverside was founded in the early 1870s and is the birthplace of the California citrus industry. Founded by John W. North and a group of Easterners who wished to establish a colony dedicated to furthering education and culture. Riverside was built on land that was once a Spanish rancho. Investors from England and Canada transplanted traditions and activities adopted by prosperous citizens: the first golf course and polo field in Southern California were built in Riverside.

The first orange trees were planted in 1871, but the citrus industry in Riverside began two years later when Eliza Tibbets received two Brazilian navel orange trees sent to her by a friend at the Department of Agriculture in Washington. The trees thrived in the Southern California climate and the navel orange industry grew rapidly. Within a few years, the successful cultivation of the newly discovered navel orange led to a California Gold Rush of a different kind: the establishment of the citrus industry. By 1882, there were more than half a million citrus trees in California, almost half of which were in Riverside. By the mid-1880s five packing houses sprang up in Riverside. The Santa Fe Railroad opened a direct line to Riverside in 1886 allowing direct shipment to the east. Eight years later the first refrigerated rail cars shipped oranges from Riverside to the east on the Santa Fe Railroad. The development of refrigerated railroad cars and innovative irrigation systems established Riverside as the wealthiest City per capita by 1895.

About 1875, Matthew Gage began work on a canal to bring water to all of Riverside, parts of which had no water available. With the irrigation made possible by Gage's canal, Riverside's greatest growth period began. Three new subdivisions—White's Addition, Hall's Addition, and Arlington Heights—were developed.

One of the first documented “disaster incidents” was on April 17, 1908, when there was an elephant stampede in Downtown Riverside. The elephant leading the stampede was named Floto. Floto was owned by the circus Sells-Floto Circus. The incident occurred when a Standard Oil wagon caught fire and ignited several of the circus tents. Frightened by this undue excitement, the herd of elephants became uncontrollable and charged through the east side of town, knocking down fences, outhouses and despoiling orchards.

During World War I, March Field, now March Air Reserve Base was established for the training of aviators. During World War II, March Field was expanded and another base, Camp Haan, was started across from March Field. The site is now occupied by the new

National Veteran's Cemetery. A third base was built, called Camp Anza, which later became a Riverside subdivision, called Arlanza.

As the City prospered, a small guest hotel designed in the popular Mission Revival style grew to become the world-famous Mission Inn, favored by presidents, royalty and movie stars. Postcards of lush orange groves, swimming pools, and magnificent homes have attracted vacationers and entrepreneurs throughout the years. Many relocated to the warm, dry climate for reasons of health and to escape Eastern winters.

Riverside has over 100 City Landmarks, 20 National Register Sites and 2 National Landmarks have been designated by the City Council, all offering enjoyment and education to City residents and visitors. Examples include the Mission Inn, the Chinatown site, the National Packing House, Citrus Experiment Station and engineering feats like the Gage Canal. Many of these landmarks are found in Downtown's Mission Inn Historic District. California's Mission Revival style, born in Riverside, can be seen throughout the city, most notably in the Mission Inn, the Municipal Auditorium, First Church of Christ Scientist, and the Fox Theater, home of the Riverside International Film Festival.

The Mission Inn was developed from the Glenwood Tavern, owned by Captain Christopher Columbus Miller, who moved to Riverside in 1874 to survey land for the Gage Canal, which brought water to Riverside. His son Frank developed a lasting interest in culture and the arts and took over the expansion of the Inn. Over the years he embellished and expanded it into a unique resort known all over the world. It has played host to numerous movie stars, musicians and heads of state. Ronald and Nancy Reagan honeymooned there, and Richard and Pat Nixon were married on its grounds. Teddy Roosevelt planted a tree in its courtyard, and a special chair, built for President William Howard Taft when he visited, is still in the Inn's collection.

1.4 ECONOMY DESCRIPTION

The city has seven distinct economic factors. These factors show the diversity of the city as it develops from a bedroom and agricultural community to a city of expanding activity. These factors are:

a. Residential/Bedroom Community
    i. Both long-term permanent housing and short-term temporary college dormitory housing
b. Industrial/Warehouse
c. Arts and Culture
d. Agriculture

e. Military
f. Education - College/University Level
    i. University of California, Riverside
    ii. California Baptist University
    iii. La Sierra University
    iv. Riverside Community College
g. Major Medical Care
    i. Three major primary hospitals for the region and several Senior Care Facilities

Figure 1.4.1 – Table Listing City of Riverside Major Employers

#	Employer	# of Employees
1	County of Riverside	24,290
2	University of California, Riverside	8,593
3	Riverside Unified School District	5,003
4	Kaiser Permanente	5,846
5	City of Riverside	2,336
6	Cal Baptist University	1,442
7	Riverside Community Hospital	2,200
8	Riverside Community College District	2,100
9	Alvord Unified School District	1,898
10	Riverside County Office of Education	1,700
11	Parkview Community Hospital	1,200
12	Riverside Community College District	1,061
13	Collins Aerospace System	1,000

1.5 POPULATION AND HOUSING

The 2021 population of the City of Riverside from the California Department of Finance was estimated at 317,261.

Figure 1.5.1 Population Characteristics – City of Riverside

2021 Census Population: 317,257

	Number of People	Percent
Hispanic or Latino	177,393	55.9%
White Alone	80,131	25.3%
Asian Alone	26,833	8.5%
Black or African American Alone	20,964	6.6%
Native Hawaiian and Other Pacific Islander Alone	1,531	0.5%
American Indian and Alaska Native Alone	271	0.1%
Population of two or more races	9,201	2.9%
Some other race	933	0.3%

Source: https://data.census.gov/table?q=Riverside+city,+California&tid=ACSDP1Y2021.DP05

1.6 VULNERABLE POPULATIONS

Some populations are at a greater risk from hazard events because of decreased resources or physical abilities. Residents of the City of Riverside living near or below the poverty line, the elderly, individuals with disabilities, women with children, ethnic minorities and renters all experience, to some degree, more severe effects from disasters than the general population. These residents lack access to key services, and many other factors affect their ability to prepare for and protect themselves and their property from a hazardous event. Higher-income households, for instance, are likely more able to afford the cost of retrofitting their homes to resist flooding or move to a location that is less prone to flooding than a lower-income household. As a result, the higher-income household is less likely to experience significant damage during a flood event than the lower-income household, even if the same amount of rain falls on both.

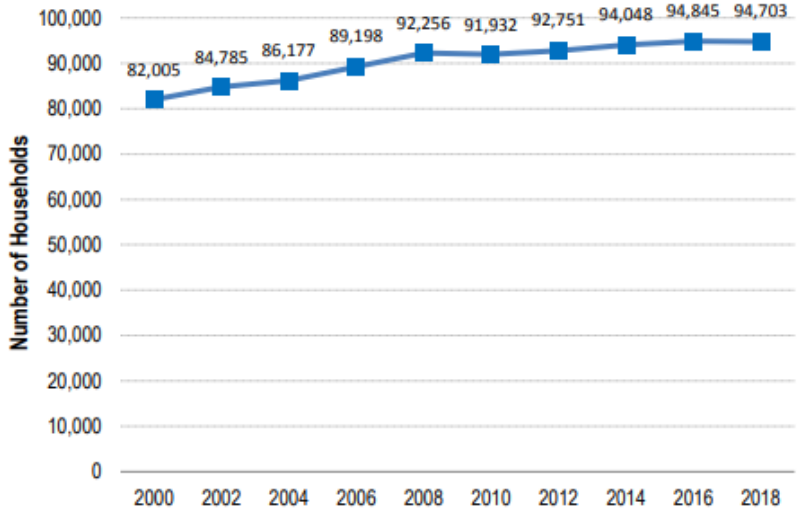
Indicators from the Census data are commonly used to assess social vulnerability.

Figure 1.6.1 US 2021 City of Riverside Income & Poverty Facts

Income & Poverty		
Median household income (in 2022 dollars), 2018-2022	$83,448	$84,505
Per capita income in past 12 months (in 2022 dollars), 2018-2022	$31,632	$35,356
Persons in poverty, percent	⚠ 12.8%	⚠ 10.9%

Figure 1.6.2 Housing Characteristics – City of Riverside

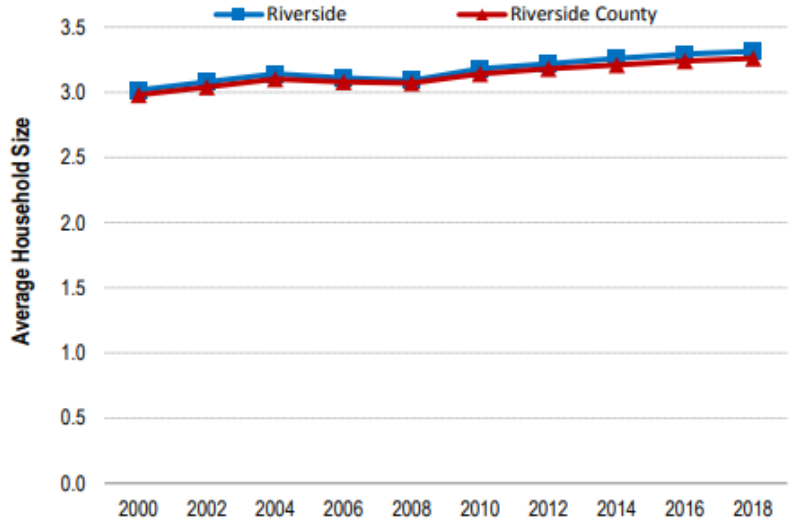
Number of Households: 2000 - 2018



Sources: California Department of Finance, E-5, 2000-2018

- Between 2000 and 2018, the total number of households in the City of Riverside increased by 12,698 units, or 15.5 percent.
- During this 18-year period, the city's household growth rate of 15.5 percent was lower than the county growth rate of 44.2 percent.
- 13.0 percent of Riverside County's total number of households are in the City of Riverside.

Average Household Size: 2000 - 2018



Source: California Department of Finance, E-5, 2000-2018

- In 2018, the city's average household size was 3.3, the same as the county average of 3.3.

1.7 DEVELOPMENT TRENDS AND LAND USE

The City of Riverside continues to grow in all areas. In the past five years the Riverside Community Hospital opened a $420 million expansion of the hospital consisting of an additional 105 rooms. Approximately 38 single family, senior, and multi-family residential projects with a total of 3,210 units are currently in the planning pipeline. Two new hotels are slated for development in the downtown area. Industrial warehouses are being built within the city limits as well adjacent to the city in the March Joint Powers area.

Changes in the land development within the City of Riverside have been seen as consistent with the expected hazard risks identified in the previous LHMP. Because this plan has integrated into the general plan for the city's Zoning, the hazards identified in this plan have not had an increase in vulnerability.

SECTION 2.0 – LHMP PLANNING & DEVELOPMENT PROCESS

2.1 LOCAL PLANNING PROCESS

The City of Riverside participated in various LHMP planning meetings in anticipation of updating the LHMP Plan as well as updating the City's Safety Element of the General Plan.

The City of Riverside's Office of Emergency Management works closely with the representatives from various City department's (See Table 2.1) on the development of updates for the City's General Plan's Safety Element and Local Hazard Mitigation Plan updates. To ensure that the city had a comprehensive approach to updating the LHMP, OEM formed a planning team consistent with best practices identified in the FEMA Hazard Mitigation Planning Guide. Representatives on the planning team are referenced in Table 2.1. OEM reached out to departments via in person meetings, phone calls and email to seek representation in the LHMP planning process. Department Representatives were invited to meetings via email. Meetings and virtual calls were held to discuss, identify, and prioritize appropriate mitigation strategies. The group was presented with an overview of the identified threats to the City of Riverside and surrounding areas. An assessment and ranking of hazards were conducted by the city LHMP Planning Team in 2023. Input from the public was sought via a survey and town halls in 2023 to gather information on how the public viewed hazards and possible mitigation strategies.

Table 2.1.1 City LHMP Planning Team

Hazard Mitigation Planning Team (HMPT) members were drawn from the Public Safety Element planning team, Sustainability and Resilience Team and department representatives.

Agency	Department	Position	Department Representative
City of Riverside	City Attorney	Assistant City Attorney	Brandon Mercer
City of Riverside	City Management	Assistant City Manager	Rafael Guzman
City of Riverside	Community & Economic Development	Deputy Director	Chris Christopoulos
City of Riverside	Community & Economic Development	City Planner	Mary Kopaskie-Brown
City of Riverside	Community & Economic Development	Principal Planner	Matthew Taylor
City of Riverside	Community & Economic Development	Senior Project Manager	Joyce Jong
City of Riverside	Fire Department	Division Chief/Fire Marshal	Craig Kodat
City of Riverside	Fire Department Office of Emergency Management	Emergency Services Administrator	Mark Annas
City of Riverside	Fire Department Office of Emergency Management	Emergency Services Coordinator	Peter Sellas
City of Riverside	Fire Department Office of Emergency Management	Homeland Security Planner	Anunciata Greer
City of Riverside	Fire Department Office of Emergency Management	Community Preparedness Coordinator	Phillip Stachelski
City of Riverside	Parks, Recreation & Community Services	Director	Pamela Galera
City of Riverside	Parks, Recreation & Community Services	Deputy Director	Randy McDaniel
City of Riverside	Police Department	Lieutenant	Kevin Kauk
City of Riverside	Public Works	Emergency Services Coordinator	Jason Jolly
City of Riverside	Public Works	Deputy Director	Nathan Mustafa
City of Riverside	Public Works	Wastewater	Kevin Street
City of Riverside	Public Utilities	Power Resources Manager	Tracy Sato

Meetings with the City Planning team members were held on:

- 5/5/21 – Public Safety Element Meeting
- 5/12/21 – Public Safety Element Meeting
- 8/29/22 – LHMP Planning Meeting
- 9/28/22 – Sustainability and Resiliency Team Meeting
- 10/26/22 – Sustainability and Resiliency Team Meeting
- 1/25/23 – Sustainability and Resiliency Team Meeting
- 2/22/23 – Sustainability and Resiliency Team Meeting

In addition to department planning members, the University of California Riverside participated in the planning process at Community Partnership, City LHMP Planning meetings, local planning process meetings with Riverside County, and/or via email and telecommunication.

2.2 PARTICIPATION IN LOCAL and REGIONAL (OA) PLANNING PROCESS

The City also participated in workshops and meetings with the Operational Area (OA) to assist in developing the plan. This process ensures that the actions and hazards are consistent with the overall hazards of the OA. Meetings the planning team attended are as follows:

- 1/13/22 – OAPC introduction/overview of LHMP given
- 3/24/22 – OAPC – update of status
- 4/13/22 – Sub Committee Meeting – review of hazards, objectives, strategies
- 5/26/22 – OAPC – updates of plan and next steps
- 6/14/22 – Multi-Jurisdictional Local Hazard Mitigation Plan / Local Hazard Mitigation Plan Kick-Off Meeting.
- 8/2/22 – MJLHMP Workshops were held for OA partners
- 8/3/22 – Sub Committee meeting – update of status determines new mitigation strategies and finalization of hazard definitions
- 8/5/22 – Local Hazard Mitigation Plan Jurisdiction Workshop – workshops for OA to refine hazard profiles, review timeline
- 11/3/22 – OAPC Meeting – update of status and delivery date identification
- 1/4/23 – Sub Committee meeting – status update
- 1/5/23 – Riverside County Emergency Management Department – meeting to determine the needs of the City of Riverside
- 1/14/23 – Community Emergency Response Team

2.3 DATES AVAILABLE FOR PUBLIC COMMENT

A public survey was held from January 9 – January 26, 2023. The survey was provided to the community using the City's website and through a survey tool. The survey was promoted via City Council meeting, social media, website, and via an email. The survey results consisted of a representative group of community members from Riverside city. There was a discussion of several mitigation efforts identified by members of the city. An assessment and top five ranking of hazards was conducted by the community members who turned in 91 completed surveys the results of which are shown on the table below. The survey also sought input on risk reduction methods and projects to reduce hazard related losses. The public comment period was promoted via release, social media accounts, email and at a CERT meeting that took place during the comment period. (See Appendix A for copies of survey.)

Public Meetings and/or comment periods were held on:

- 1/10/2023 – City Council Presentation to Promote Survey
- 3/31/2023 to 4/9/2023 – Public Comment Period on LHMP Annex Draft

In addition, an LHMP webpage was created to allow feedback to be submitted at any time. This webpage was linked to from the City of Riverside's main site, www.riversideca.gov, as well as at the direct link of https://riversideca.gov/fire/divisions/office-emergency-management/lhmp

Figure 2.3.1 Survey Social Media Posts

Figure 2.3.2 Public Comment Period Social Post

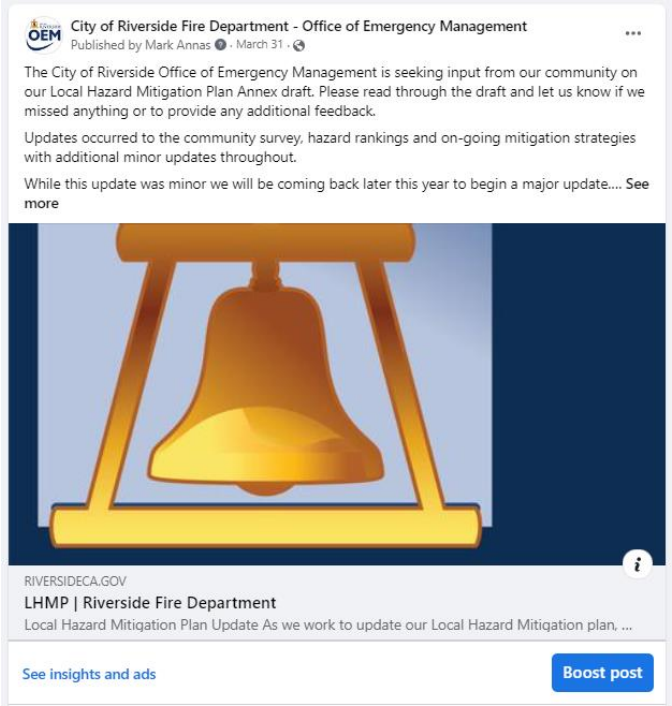


Figure 2.3.3 LHMP Webpage, February 20, 2023

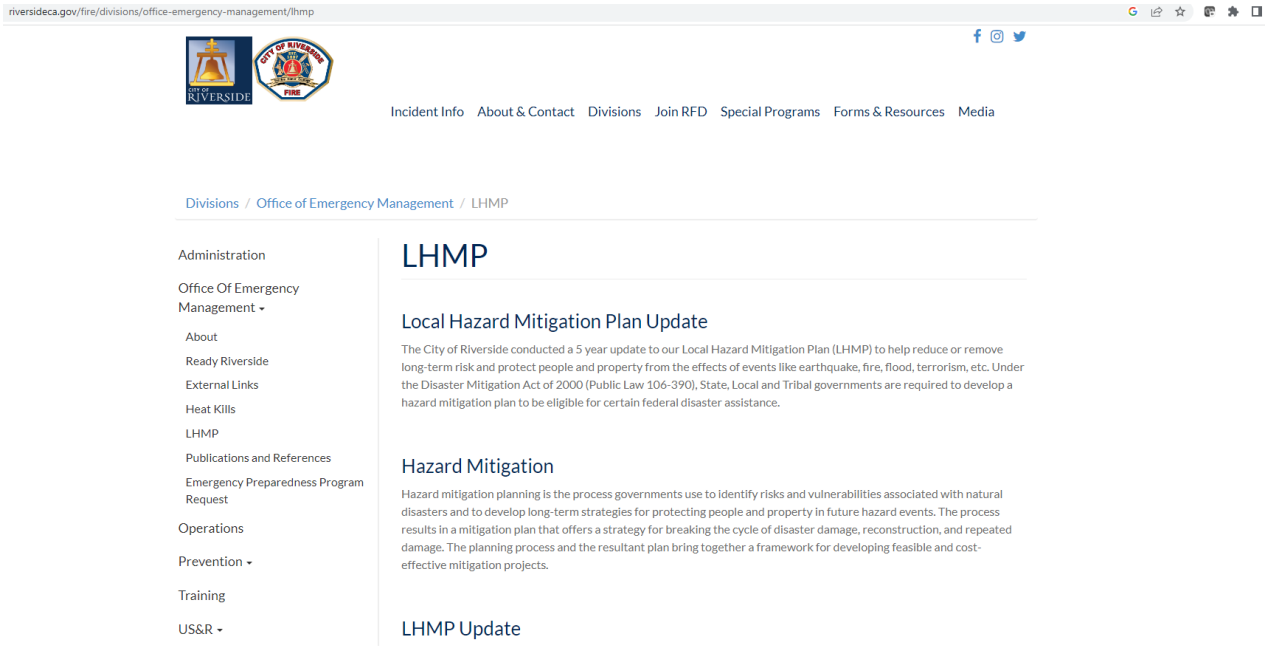


Table 2.3.1 2023 Ranking Community Survey- City of Riverside

Residents, Community Organizations, Non-Profit Organizations and business owners were asked to rank their top five hazards of most concern to their neighborhood, home and/or business.

HAZARD	Community Survey
Earthquake	1
Power Grid Emergency (Power Outage/Disruption)	2
Water Supply Disruption	3
Wildland Fire	4
Severe Weather: Extreme Heat	5

2.4 PLANS ADOPTED BY RESOLUTION

Upon approval by FEMA, the LHMP will be presented to the City of Riverside City Council in a public meeting for adoption via an official Resolution.

SECTION 3.0 – MITIGATION ACTIONS/UPDATES

3.1 UPDATES FROM 2018 PLAN

The City of Riverside has not experienced significant changes in priorities since the approval of the 2018 plan. The previous plan updates included new hazards based on risk assessments completed for the City. It reconciled changes made to the plan as required by FEMA for local hazard mitigation plan updates. This section is a list of mitigation actions that have been updated.

Table 3.1.1 List of 2018 Mitigation Project Updates

Hazard Type	Project Description	Lead Department	Status/Update
Multi-Hazard	Incorporate Updated Local Hazard Mitigation Plan with City of Riverside General Plan	Fire Department -Office of Emergency Management	Public Safety Element adopted by Council 10/5/2021. Completed
Earthquake	Seismic Improvements to City's Drinking Water System	City of Riverside Public Utilities	Not Completed, has been postponed for future mitigation
Earthquake	Retrofit Hunter Substation	City of Riverside Public Utilities	Not Completed, RFP in process
Earthquake	Museum Retrofit (Harada House)	Museum of Riverside	Not Completed, has been incorporated in 2023 LHMP
Fire	Wildfire Mitigation Plan.	City of Riverside Public Utilities	Completed 2023. 2024 Plan is under review.

Fire	Brush Clearance in wildland urban interface areas	City of Riverside Fire, Public Utilities, and Parks	Not Completed, project has been incorporated in new plan. Awarded $1,275,200 from Climate Investments Wildfire Prevention Grant in 2023 for Boy Scout Camp area of Santa Ana River bottom.
Flood	Doty-Trust Park Storm Preparations Install plastic sheeting and sandbagging on slopes to reduce runoff and prevent mudslides in parks.	City of Riverside Parks, Recreation, Community Services	Completed
Flood	Raise levee between Water Quality Control Plant (WQCP) and Santa Ana River	Public Works	Completed 2017/2018
Multi-Hazard	Video surveillance and access control project. Substation physical security project at all RPU critical electric infrastructure sites.	City of Riverside Public Utilities	Completed June 23, 2016. Continual Upgrades occurring.

3.2 NEW HAZARDS OR CHANGES FROM 2018

The following hazards were changed since the approval of the 2018 plan: Nuclear – SONGS incident was changed to Nuclear or Radiological Incident. Additionally, the Attack Against Agriculture – Terrorism was merged with the main Terrorism hazard.

Consequence Analysis

To rank the hazards for the city. The planning team was asked to evaluate the potential for an event to occur in the jurisdiction by hazard and the potential impact on the following:

1. Public (loss of life and injuries)
2. Responders
3. Continuity of operations for continued delivery of services
4. Property, facilities, and infrastructure
5. Environment
6. Economic condition of the jurisdiction
7. Ability to recover from the event and return to normal daily activities
8. Public confidence in the jurisdiction's governance

The planning team was then asked to rate the potential and severity using a scale of between 0 and 4 (4 being the most severe). The jurisdictions were also asked to rank the listed hazards as they relate to their jurisdiction from 1 to 24 (1 being the highest overall threat to their jurisdiction). From those factors, the significance of each hazard was prioritized in a high medium to low significance. See table 3.2.1 City Hazard Chart for the summary along with the methodology for defining the significance. Additional information about what documentation, tools and resources were used to identify the hazards is discussed under section 4.0.

Table 3.2.1 City Hazard Chart

Hazard	Severity Average	Probability Average	Ranking Average	2023 Final Rank	2018 LHMP Rank	Top 5 Hazard Significance
Earthquake	4.00	3.29	1.00	**1**	1	High
Drought	3.14	3.00	3.43	**2**	3	High
Flood	3.00	2.71	3.71	**3**	2	High
Wildland Fire	2.57	3.14	4.86	**4**	5	High/ or Medium
Terrorism	2.50	2.00	7.29	**5**	4	Medium
Severe Weather: Extreme Heat	2.14	3.00	7.43	**6**	7	
Power Outage/ Disruption	2.17	2.50	7.57	**7**	6	
Pandemic/ Disease/ Contamination	2.86	2.86	8.29	**8**	18	
Transportation Disruption	2.17	2.33	9.14	**9**	9	
Severe Weather: Wind Event	2.14	2.71	10.14	**10**	8	
Water System Disruption	2.00	1.86	11.43	**11**	10	
Gas/Fuel Pipeline Disruption	2.17	2.00	11.71	**12**	13	
Cyber Disruption	2.29	2.14	12.29	**13**	12	
HazMat Incident	2.17	2.86	13.00	**14**	11	
Severe Weather: Winter Weather	1.86	1.71	14.43	**15**	14	
Civil Unrest	2.00	1.83	15.57	**16**	21	
Dam Failure/Inundation	2.00	1.57	17.43	**17**	19	
Communications Outage	2.17	1.86	17.71	**18**	15	

Sewer System Disruption	2.00	1.71	18.71	**19**	16	
Insect Infestation	1.71	1.71	19.00	**20**	20	
Landslide	1.29	1.00	20.29	**21**	22	
Tornado	2.00	1.00	21.00	**22**	24	
Nuclear/Radiological Incident	2.17	1.17	21.43	**23**	23	
Jail/Prison Event	1.33	1.29	22.14	**24**	25	

Geographic Extent:
Limited: Les then 10% of planning area
Significant: 10-25% of planning area
Extensive: 25-50% of planning area
Extreme: 50-100% of planning area
Likelihood of Future Occurrences:

Highly Likely: Near 100% chance of occurrence in next year, or happens every year
Likely: between 10 an 100% chance of occurrence in next year, or has a reoccurrence interval of 10 years or less
Occasional: Between 1 and 10% chance of occurrence in the next year, or has a reoccurrence interval of 11 to 100 years
Unlikely: Less than 1% chance of occurrence in the next 100 years, or has a reoccurrence interval of greater than every 100 years

Magnitude/Severity:
Catastrophic: More than 50% of property severely damaged; shutdown of facilities for more than 30 days; and/or multiple deaths
Critical: 25-50% of property severely damaged: shutdown of facilities for at least two weeks; and/or injuries and/or illnesses result in permanently disability
Limited: 10-25% of property severely damaged: shutdown of facilities for at least two weeks; and/or injuries and/or illnesses result in permanently disability
Negligible: Less than 10% of property severely damaged, shutdown of facilities and services for less than 24 hours; and/or injuries/illnesses treatable with first aid

Significance:
High: widespread potential impact
Medium: moderate potential impact
Low: minimal potential impact

**This rating scale was developed by the Federal Emergency Management Administration. (2013) FEMA Local Mitigation Planning Handbook

3.3 BRIEF STATEMENT OF UNIQUE HAZARDS

The City of Riverside faces a diverse array of potential natural and human caused hazards. As with most cities in the Inland Empire, one of the primary concerns is the impact of a large earthquake in the region. Flood risk is a real concern with the Santa Ana River nearby, the large number of dams and reservoirs in and close to the City, the number of canals and arroyos traversing the city, and the low lying areas in the City that are routinely subject to flooding during heavy rains. The City's undeveloped hillsides and the Santa Ana River Basin provide an untapped fuel base for the City's yearly round of wildfires. Additionally, the legal and illegal activities of businesses and members of the community in the basin present potential hazards as well. The City's transportation network of roads, freeways, rail lines and airports provide additional associated risks to the city.

Table 3.3.1 List of County and City Hazards Crosswalk

County Hazard	City Hazard
Earthquake	Earthquake
Pandemic Flu	Pandemic/Disease/Contamination
Wildland Fire	Wildland Fire
Electrical Failure	Power Outage/Disruption
Emergent Disease/Contamination	See Pandemic/Disease/Contamination
Cyber Attack	Cyber Disruption
Terrorist Event	Terrorism
Communications Failure	Communications Outage
Flood	Flooding
Civil Disorder	Civil Unrest
Climate Change	Impacts multi hazards
Drought	Drought
Nuclear/Radiological Incident	Nuclear Radiological Incident–
Extreme Weather	See Severe Weather: Extreme Heat See Severe Weather: Wind Event See Severe Weather: Winter Weather
Transportation Failure	Transportation Disruption
Dam Failure	Dam Failure/Inundation
Aqueduct	See Water System Disruption

Tornado	Tornado
Insect Infestation	Insect Infestation
Jail/Prison Event	Jail/Prison Event
Pipeline Disruption	Gas/Fuel Pipeline Disruption
Landslide	Landslide
Hazmat Incident	Hazmat Incident
Water Supply Disruption/Contamination	Water System Disruption
	Sewer System Disruption
	Severe Weather: Wind Event
	Severe Weather: Extreme Heat
	Severe Weather: Winter Weather

SECTION 4.0 - HAZARD IDENTIFICATION AND RISK ASSESSMENT

4.1 HAZARD IDENTIFICATION

Hazard Mitigation Planning Team (HMPT) conducted a hazard identification study to determine the hazards that threaten the planning area. This section details the methodology and results of this effort. The following data sources were used for this Hazard Identification portion of the plan update:

- General Plan
- LHMP Survey
- 2018 Riverside County MJLHMP
- NOAA Storm Events Database
- FEMA National Risk Index (NRI) Comparison Report
- FEMA Disaster Declaration Database

Using existing natural hazards data and input gained from the kickoff planning meeting, the HMPT agreed upon a list of natural hazards that could affect the City. Hazards data from the California Office of Emergency Services (Cal OES), FEMA, the National Oceanic and Atmospheric Administration (NOAA), and many other sources were examined to assess the significance of these hazards to the City. The significance of each identified hazard was measured in quantitative terms and focused on key criteria such as frequency and resulting damage, which includes deaths and injuries, as well as property and economic damage. The natural hazards evaluated as part of this LHMP

include those that have occurred historically or have the potential to cause significant human and/or monetary losses in the future.

As a starting point, the National Risk Index (NRI) Comparison Report for the census tracts in the Planning Area was run to identify hazards of concern to the City of Riverside. Building upon this effort, the Disaster Declaration Database was downloaded from FEMA and the California Treasures Office, additionally, a storms data search was conducted via the NOAA Website. The Hazard Mitigation Planning Team (HMPT) also considered the City's General Plan Safety Element and 2018 Riverside County MJLHMP. Based upon these historical documents, the HMPT identified 4-High Significant hazards, which were profiled and had vulnerability assessments conducted in the Local Hazard Mitigation Plan (LHMP).

4.2 CRITICAL FACILITIES AND INFRASTRUCTURES

Critical facilities and infrastructures are facilities that are essential to the health and welfare of the population and have a potential to impact public health and welfare – especially after a hazard event. For this reason, the list of critical facilities was categorized using the following lifeline categories defined in the FEMA Hazard Mitigation Guidelines:

Safety and Security—Law Enforcement/Security, Search and Rescue, Fire Services, Government Service, Responder Safety, and Imminent Hazard Mitigation

Food, Water and Sheltering—Evacuations, Schools, Food/Potable Water, Shelter, Durable Goods, Water Infrastructure, and Agriculture

Health and Medical—Medical Care/Hospitals: Patient Movement, Public Health, Fatality Management, Health Care, and Supply Chain

Energy—Power (Grid), Temporary Power and Fuel

Communications—Infrastructure, Alerts, Warnings, Messages, 911 and Dispatch, Responder Communications and Financial Services

Transportation—Highway/Roadway, Mass Transit, Railway, Long Beach Airport, Maritime and Pipeline, Port of Long Beach

Hazardous Materials—Facilities, Hazardous Debris, Pollutants and Contaminants

The total amount of facilities and infrastructures within the City of riverside are shown in Table 4.2.1.

Table 4.2.1 Facilities and Critical Infrastructure

Critical Facilities Type	Number
Airports	1
Communications Centers	3
Community Centers (Shelters)	15
Courts	4
Dams/Reservoirs	11
Detention Centers	3
Emergency Command Centers	2
Federal Law Enforcement/Court Facilities	9
Fire Stations	14
Maintenance Yards	2
Non-Governmental Buildings	25
Police Stations	6
Primary Care Hospitals	3
Primary County Buildings	30
Primary City Buildings	13
Public Utilities – Electric Facilities	19
Public Utilities – Water Facilities	33
Schools and Day Care Facilities	121
Water Treatment Plants	2

4.3 ESTIMATING POTENTIAL LOSS

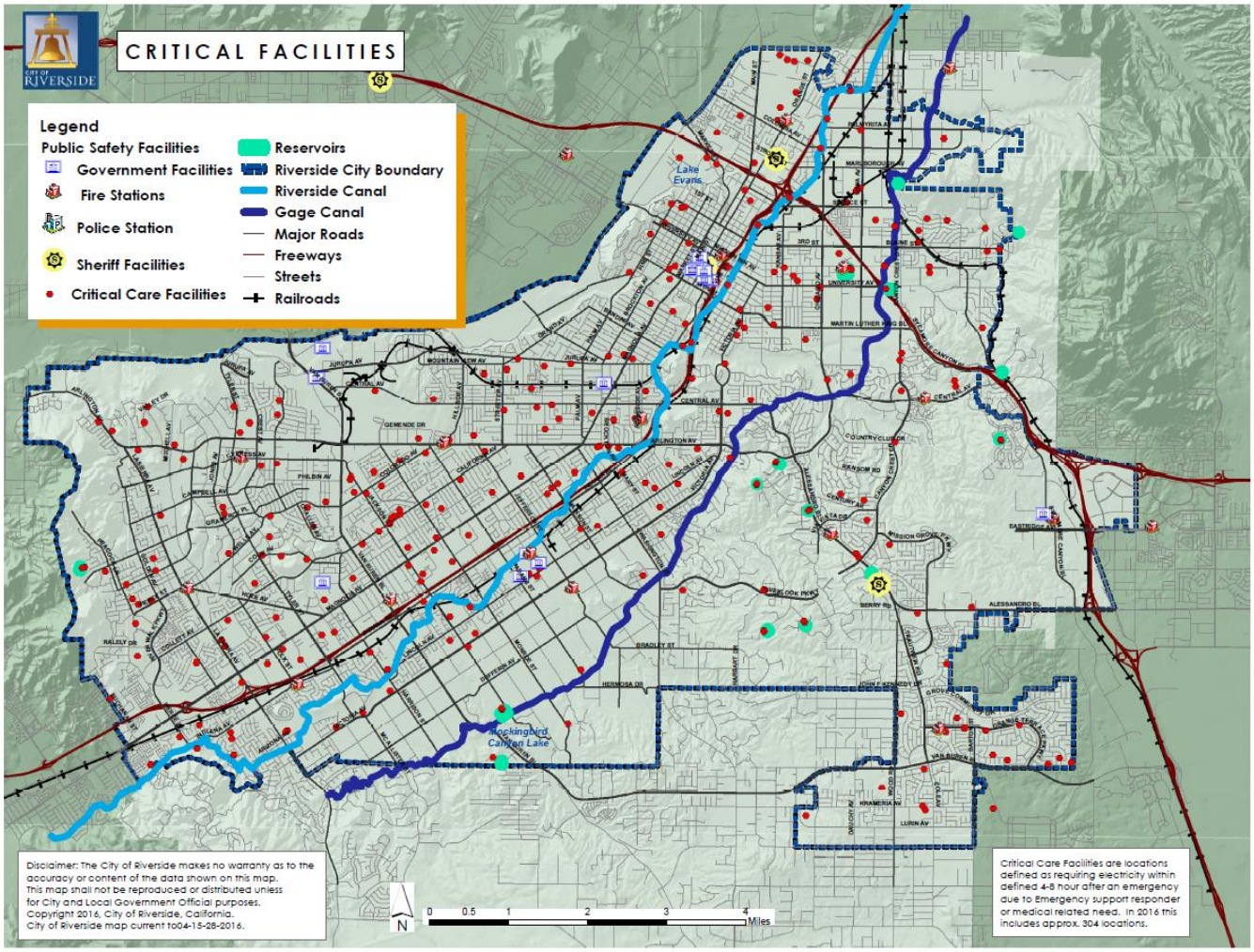
Please refer to Riverside County Operational Area MJLHMP Section 4.5 for the property loss value for the City of Riverside.

4.4 FACILITIES AND CRITICAL INFRASTRUCTURE REPLACEMENT VALUES

Current listed assets in the City that are exposed to multiple hazards.

Type of Asset	Total Sum of Building Value ($)
Commercial	$26,936,826,374
Government	$214,331,572
Higher Education	$4,206,429,438
Hospitals	$765,231,532
Residential	$2,286,051,541
Schools	$2,537,729,610

Figure 4.4.1 Critical Facilities



4.5 IDENTIFICATION OF RISKS AND VULNERABILITIES

The Planning Team conducted a comprehensive vulnerability assessment of the city's susceptibility to various natural hazards ensuring effective disaster preparedness and mitigation strategies. Guided by the mandates of the Disaster Mitigation Act regulations, the Planning Team evaluated the risk and vulnerability associated with priority natural hazards identified in the planning process. The vulnerability assessment quantifies, to the extent feasible using best available data, assets at risk to natural hazards and estimates potential losses.

This section summarizes the possible impacts and quantifies, where data permits, the City's vulnerability to each of the hazards identified in table 3.2.1.

- Earthquake
- Drought
- Flood
- Wildfire

Earthquake - Severity – 4, Probability – 3, Rank 1

The Alquist-Priolo Earthquake Fault Zoning Act requires the State Geologist to identify earthquake fault zones along traces of both recently and potentially active major faults. Although there are no such zones within the City or its Sphere of Influence, earthquakes are still of a major concern with the proximity of major fault zones to the City. See Figure 4.4.1 Fault Zone Map and Figure 4.4.2 Fault Map Riverside County.

For planning purposes, the City of Riverside uses FEMA's HAZUS data for determining the types of damages and impacts of various earthquakes. For the LHMP process, the City has selected a scenario of a 7.8M earthquake on the San Andreas Fault with an epicenter in the Salton Sea region. This scenario has been used by Cal-OES for planning purposes and provides the highest potential for damage to the City based on the capabilities of all of the earthquakes in the area.

A major earthquake occurring in or near the City may cause deaths and casualties, extensive property damage, fires and hazardous material spills and other ensuing hazards. The effects could be aggravated by aftershocks and by the secondary effects of fire, hazardous material/chemical accidents and possible failure of the waterways and dams. The time of day and season of the year would have a profound effect on the number of dead and injured and the amount of property damage sustained. Extensive search and rescue operations would be required to assist trapped or injured persons. Emergency medical care, food and temporary shelter could be required by injured or

displaced persons. The identification and burial of many dead persons would pose difficult problems; public health would be a major concern. Mass evacuation may be essential to save lives, particularly in areas downwind from hazardous material releases. Many families would be separated particularly if the earthquake should occur during working hours, and a personal inquiry or locator system could be essential to maintain morale. Emergency operations could be seriously hampered by the loss of communications and damage to transportation routes within, and to and from, the disaster area and by the disruption of public utilities and services.

(See Figure 4.4.1 Fault Zone Map and Figure 4.3.1 Critical Facilities.)

The economic impact on the City of Riverside from a major earthquake would be considerable in terms of loss of employment and loss of tax base. Also, a major earthquake could cause serious damage and/or outage of computer facilities. The loss of such facilities could curtail or seriously disrupt the operations of banks, insurance companies and other elements of the financial community. In turn, this could affect the ability of local government, business and the population to make payments and purchases.

Although there are a number of faults within a 50-mile range of the City, the fault zones listed below are seen as primary faults to the City.

The **San Andreas Fault** lays to the east of the City and at its closest point is eleven miles from Downtown Riverside, abutting the San Bernardino Mountains. The San Andreas Fault is estimated to have the capability of producing up to an 8.3 magnitude (M) earthquake.

The **San Jacinto Fault** also lays to the east of the City and at its closest point, is seven miles from Downtown. This fault passes through the intersection of Interstates 10 and 215, the City of Loma Linda and the Box Springs Mountains. This fault has the capability of producing up to a 7.0M earthquake.

The **Elsinore Fault** passes within thirteen miles of Downtown, extending approximately four miles west of Lake Mathews and Corona and south into the city of Lake Elsinore. This northwest-southwest trending fault has the capability of producing up to a 6.0M earthquake.

The **Chino and Whittier Faults** are the two upper branches of the Elsinore Fault Zone. Northwest of Corona (Glen Ivy area), the Elsinore fault splits into two segments: the southwestern strand becoming the 40 km long Whittier Fault (probable magnitudes

between 6.0 and 7.2) and the northeastern strand becoming the 21 km long Chino Fault (probable magnitudes between 6.0 and 7.0).

The **Chino-Central Avenue Fault** is located in the western portion of the Valley Region and is within an Alquist-Priolo Zone indicating that movement within the past 11,000 years is suspected. The Chino-Central Avenue fault is a southwest dipping, reverse-right lateral oblique slip fault that splays off from the Elsinore fault in the Corona area and continues to the Chino area for a total length of about 17 miles (28 kilometers). The Chino-Central Avenue fault is considered capable of generating a magnitude 6.7 earthquake.

(See Riverside County OA MJLHMP Section 5.3.1).

Figure 4.5.1 Fault Zone Map City of Riverside

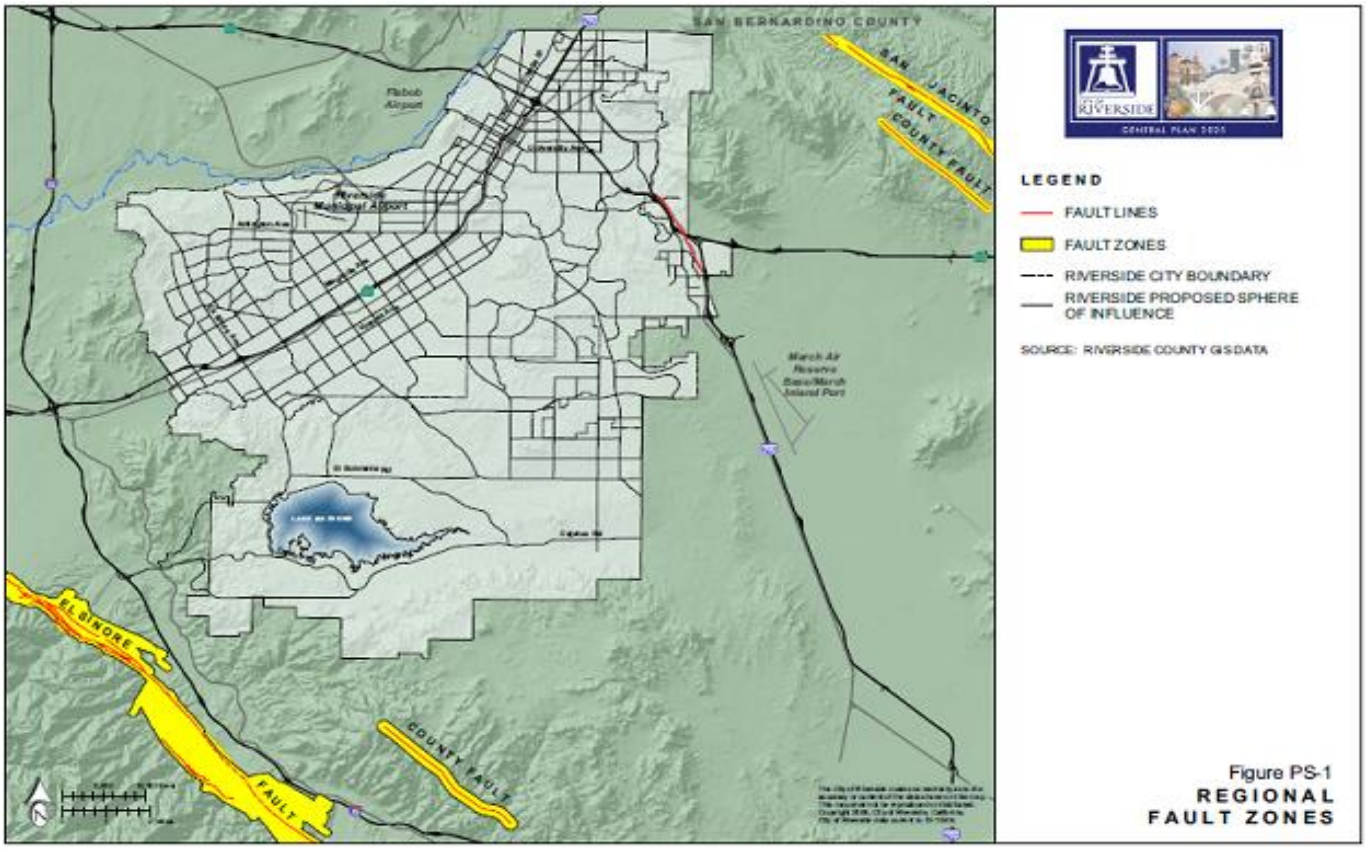
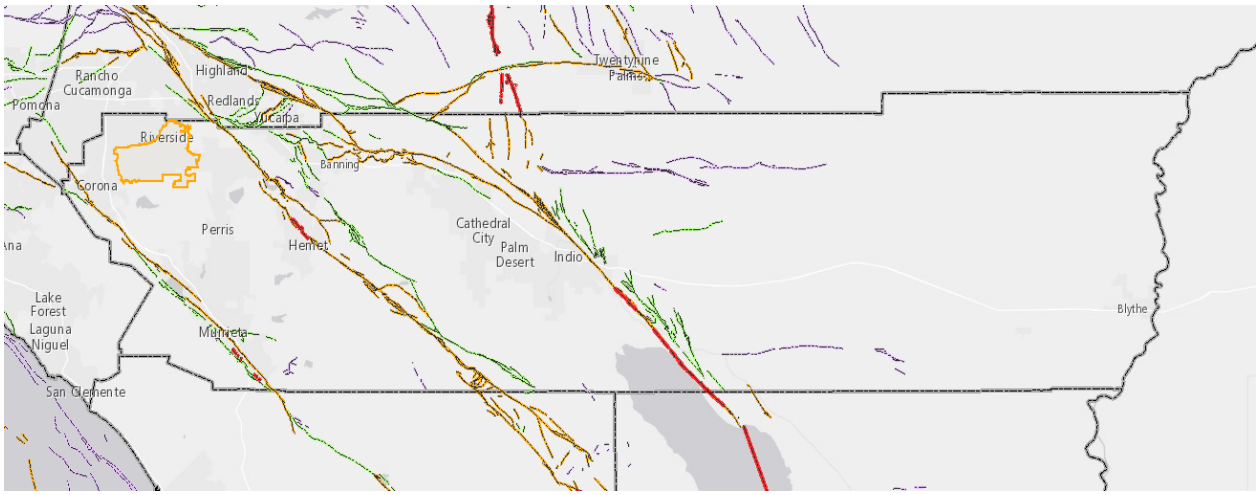
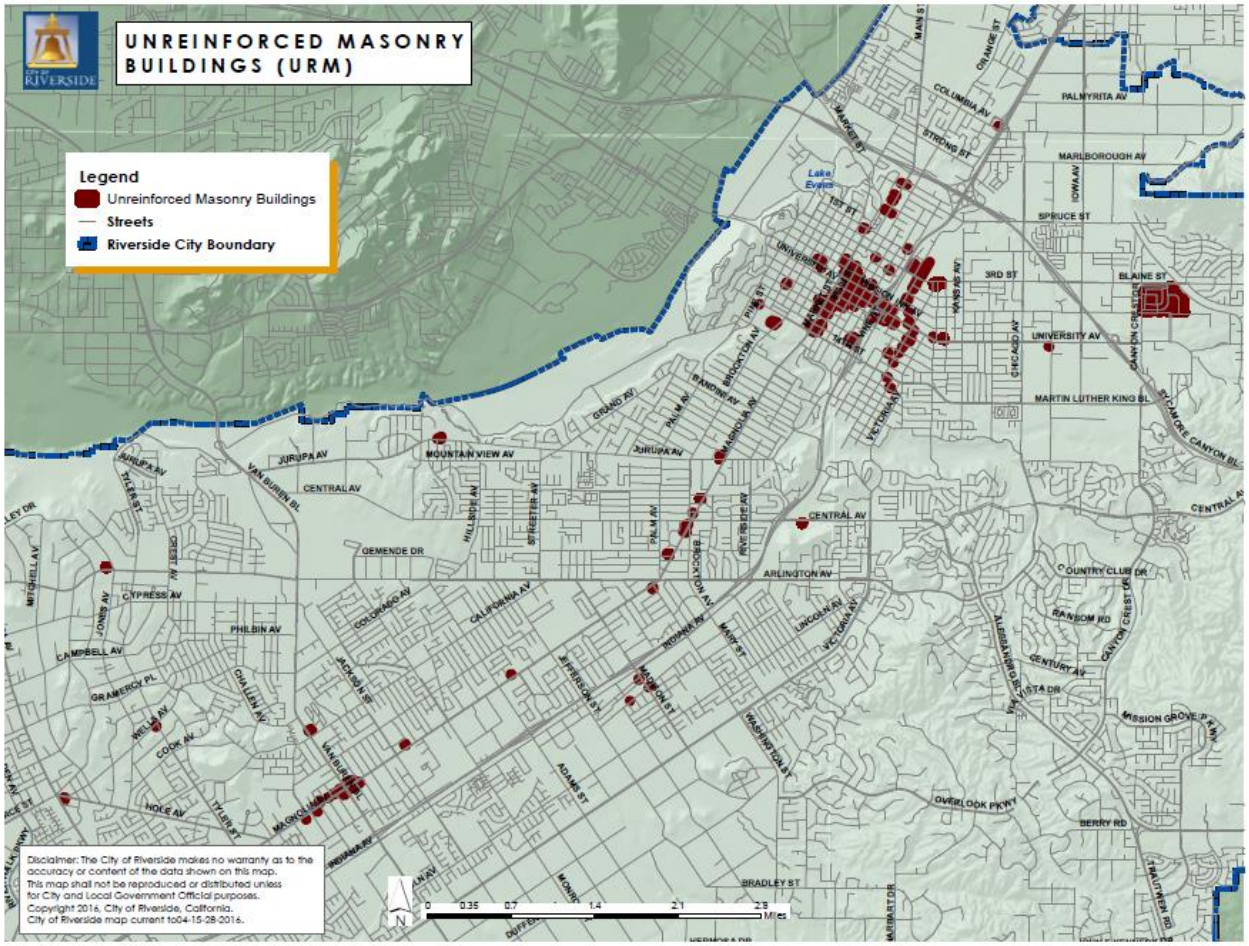


Figure 4.5.2 Fault Map – Riverside County





Drought – Severity – 3, Probability – 3, Rank 2

A drought is a period of dry weather: a long period of extremely dry weather when there is not enough rain for the successful growing of crops or the replenishment of water supplies.

Drought is a gradual phenomenon. Normally, one dry year does not constitute a drought in California, but rather serves as a reminder of the need to plan for droughts. California's extensive system of water supply infrastructure (reservoirs, groundwater basins, and interregional conveyance facilities) generally mitigates the effects of short-term dry periods for most consumers of water.

Drought can have secondary impacts. For example, drought is a major determinant of wildfire hazard, in that it creates greater propensity for fire starts and larger, more prolonged conflagrations fueled by excessively dry vegetation, along with reduced water supply for firefighting purposes. Drought is also an economic hazard. Significant economic impacts on California's agriculture industry can occur as a result of short- and long-term drought conditions; these include hardships to farmers, farm workers, packers, and shippers of agricultural products.

In some cases, droughts can also cause significant increases in food prices for the consumer due to shortages.

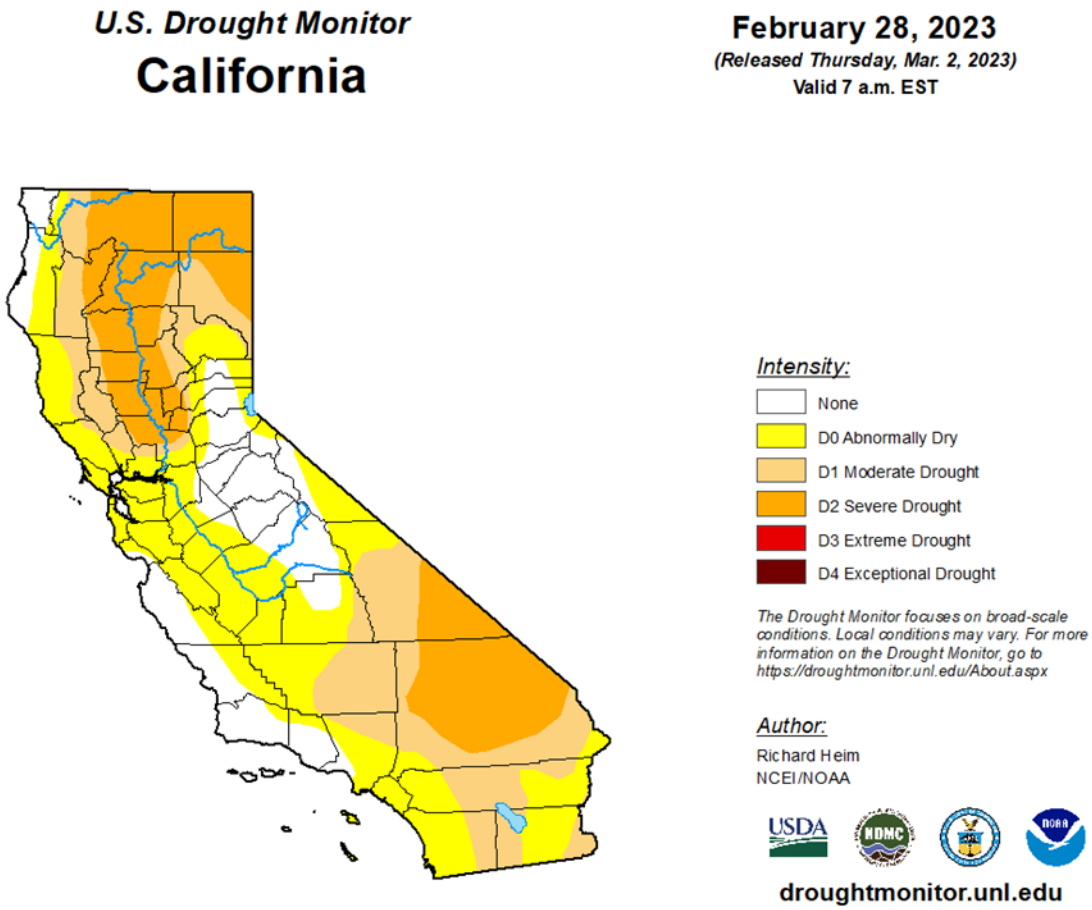
Experience with California droughts tell us that drought impacts are felt first by those most dependent on or affected by annual rainfall – agencies fighting forest fires, ranchers engaged in dryland grazing, rural residents relying on wells in low yield rock formations, or small water systems lacking a reliable water source.

Drought Risk Assessment

Although a drought in and of itself is not a direct threat to property and life, the impact on the agricultural industry and home development can be monumental. The costs to Riverside County for the current drought in terms of fire damage and forest management have been in the millions. This is a chronic problem for Riverside County and accounts for significant indirect costs, loss of property and threat to human life.

Climate scientists studying California find that drought conditions are likely to become more frequent and persistent over the 21st century due to climate change. The experiences of California during recent years underscore the need to examine more closely the state's water storage, distribution, management, conservation, and use policies.

Figure 4.5.3 U.S. Drought Monitor – California



(See Riverside County OA MJLHMP Section 5.3.11)

Flood – Severity – 3, Probability – 3, Rank 3

The City has been involved in six Presidential Declarations in the last fifteen years for flooding events. Flooding represents a potential hazard to residents and property within the City. Flood hazards may be considered in two categories:

- Natural flooding from heavy rains
- Dam, reservoir or water tank failure.

While the majority of the area potentially subject to flooding is located along the Santa Ana River, local topography and the presence of a number of large aboveground water

storage tanks, increase the potential for flood events in other portions of the City. There has been one property with a repetitive loss within the City of Riverside. The principal types of flood hazards in the City include stream flooding, bridge scours, dam inundation and earthquake-induced flooding (seiches). The City is potentially vulnerable to flooding associated with the Santa Ana River and other small-scale floods originating from the hillsides in the City, local dams, and canals. While not likely to occur in the City, bridge foundations are vulnerable to scouring during a flood.

There are several portions of the City of Riverside that are prone to urban flooding due to debris accumulation in storm drains and in flood control channels and basins, overburdened sewage pumping stations, and aged drainage systems. Low-lying areas of the City are particularly susceptible to regular flooding. Over the past several years, the City has had heavy flooding as a result of heavy rains.

The flood hazard areas of the City are subject to periodic flooding that can adversely affect the public health, safety, and general welfare. Contamination due to flooded sewage systems poses the greatest risk to health and safety of persons in the affected areas. The heavy rains will overtax the sewer system, causing a backup. Many times, this will cause sewage to flow up from manhole covers onto the streets.

Additionally, there is a high probability that there will be some underground facilities (transformers and switches) impacted by the high volume of water. Potentially this will cause power outages, electrical shorts and fires in some underground vaults, as well as potentially severe damage to the electric supply equipment.

(See Figures 4.5.3 and Figure 4.5.4 for 100 - 500-year flood maps.)

Repetitive flooding areas

In many cases, the flooding has caused repetitive damage. These repetitive areas include:

- 14th Street and Highway 91
- Arlington Avenue and the railroad tracks
- Don Derr Park
- Downtown Area
- Fairmount Park
- Lake Evans
- Reid Park Rugby Field
- University Avenue at the railroad tracks
- Van Buren Avenue and Indiana Avenue

Table 4.5.1 City of Riverside Repetitive Loss Properties

Location	Mitigated?	Insured?	Date of Loss	Date of Loss	Total Paid
Riverside	Yes	No	04/13/2016	02/14/2019	$ 30,844.87

(See Riverside County OA MJLHMP Section 5.3.9)

Figure 4.5.4 – 100- and 500-Year FEMA Flood Zone Map – City of Riverside

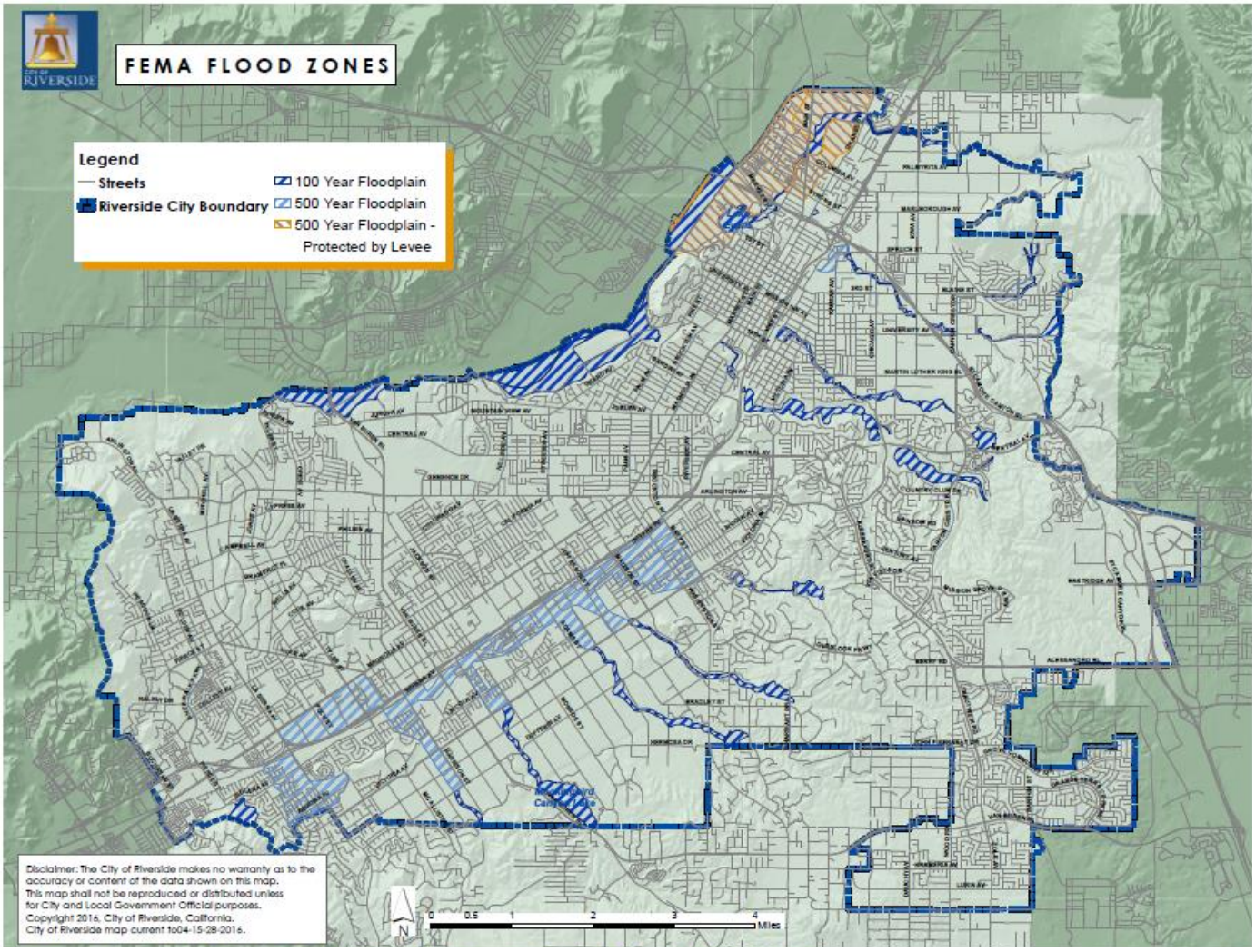


Figure 4.5.5 Flood Zones - Licensed Health Care Facilities

Wildland Fire - Severity –2, Probability –3, Rank 4

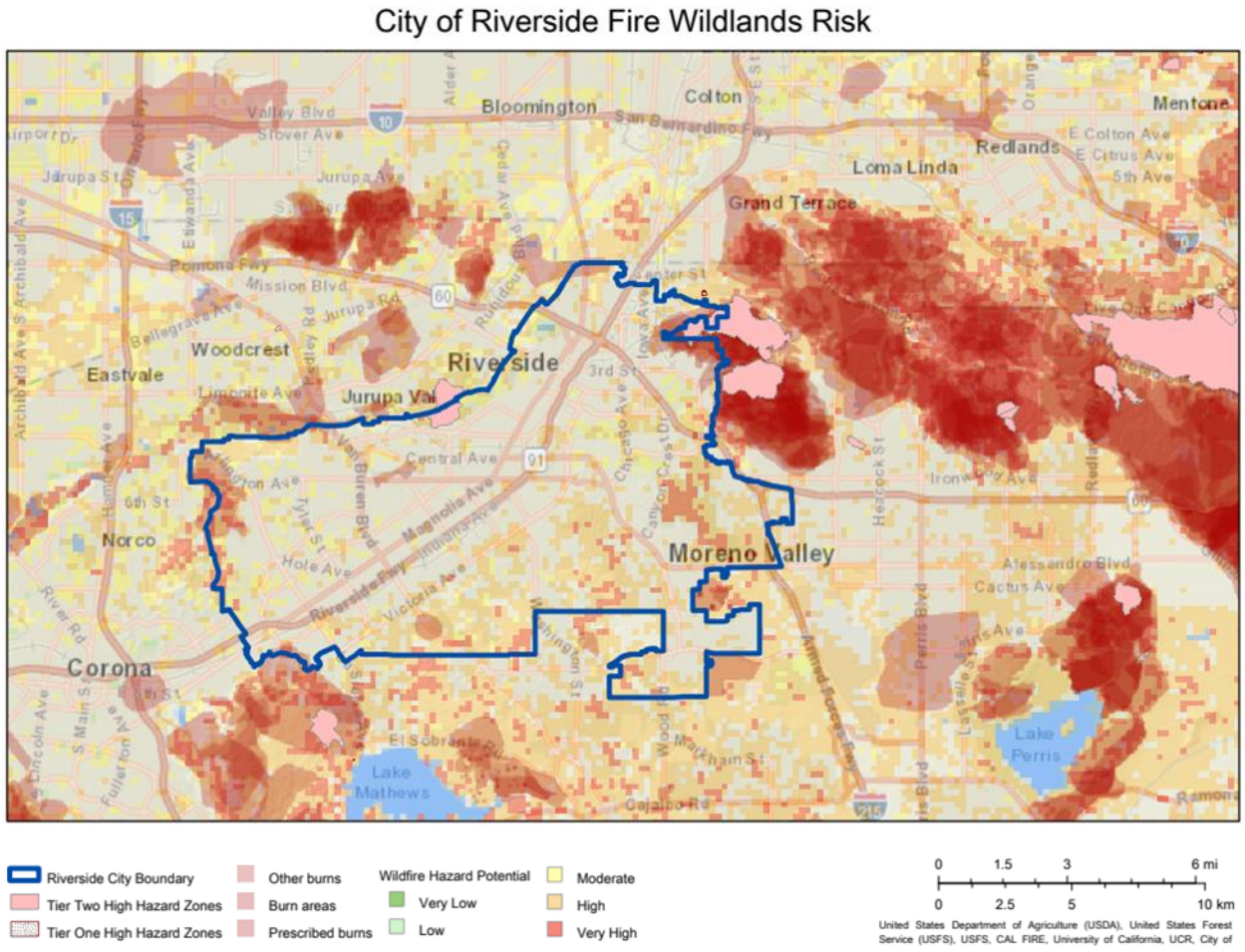
The City of Riverside has had twenty-two (twenty acres or more) wildland type fires in the last ten years and numerous smaller wildland fires. California law requires that periodic assessments and strategic plans be developed to inform policy decisions on the state's forest and rangeland resources (Cal Fire is mandated by Public Resource Code 4789). The City of Riverside participated in the assessment process for the City and its Sphere of Influence and the attached map has been approved by Cal Fire and the City. As shown on the map, the City has three distinct areas where the threat of wildland fires exists. See Figure 4.5.6 Fire Hazard Map.

The Santa Ana River corridor is made up of a large amount of lush, natural vegetation within the watercourse and its immediate surroundings. The threat of fire in the riverbed is high from both natural causes and human created causes. Many of the fires in the riverbed have been associated with the various encampments that exist within the foliage areas.

This area within the City exists where the urban and suburban developments have come together against open expanses of wildland areas. This type of interface can be found in the City in the areas of UCR, Sycamore Canyon/Canyon Crest, Norco Hills, and the regional nature parks.

The City rests in a valley surrounded on three sides by foothill areas that fall under this category. Typically, these areas are mostly covered with scrub brush and small trees. Firefighting efforts in these areas are hampered by limited fire apparatus access and a limited supply of water. Areas that fall in this category are Mt. Rubidoux, Woodcrest, Lake Hills/Mockingbird Canyon/Monroe Hills/La Sierra/Norco Hills areas, and Box Springs Mountain.

Figure 4.5.6 Fire Hazard map



(See Riverside County MJLHMP Section 5.3.3)

Figure 4.5.7 Past Wildland Fires

Terrorism – Severity – 3, Probability – 2, Rank 5

In 2012 a suspect in a terror case involved a Riverside resident who was tried and convicted at Riverside Federal Court of material support to terrorism. In 2013 "domestic terror" suspect Christopher Dorner shot and killed two law enforcement officers including Riverside Police Department Officer Michal Crain and wounded two others including a Riverside officer. A Riverside resident was charged with material support to terrorism in connection with the December 2, 2015, San Bernardino terror attacks and accused of plotting to carry out attacks in 2011 and 2012. As with most cities in California, Riverside has its vulnerabilities from both international and domestic U.S. terrorist groups and lone offenders. Located in the City are numerous locations which are part of the City's Critical Infrastructure List that could be sites of potential terrorism. These sites include numerous local, state and federal buildings, local dams/reservoirs, research facilities, agricultural sites, and public assembly sites. As the County Seat, there are many locations that could be a target for a localized individual terrorist attack.

The National Terrorism Advisory System has stated that the United States remains in a heightened threat environment. Lone offenders and small groups motivated by a range of ideological beliefs and/or personal grievances continue to pose a persistent and lethal threat to the Homeland. Domestic actors and foreign terrorist organizations continue to maintain a visible presence online in attempts to motivate supporters to conduct attacks in the Homeland.

(See Riverside County OA MJLHMP Section 5.3.7)

Table 4.5.2 Extreme Weather Hazards

Hazard	Severity	Probability	Ranking
Drought	3	3	2
Extreme Heat	2	3	6
Wind Event	2	3	10
Winter Weather	2	2	15
Tornado	2	1	22

Extreme Weather: Extreme Heat - Severity – 2, Probability – 3, Rank 6

Extreme heat can be described as overly hot temperatures that are sustained to the extent that human and animal overexposure can cause heat illness and death. Heat illness is a major cause of preventable morbidity in regions characterized by high ambient temperatures.

(See Riverside County OA MJLHMP Section 5.3.13)

Extreme Weather: Wind Event - Severity – 2, Probability – 3, Rank 10

Santa Ana Winds have caused large amounts of damage and increased the fire damage level dramatically. The history table for Wind Events shows the high number of events that are directly attributed to Santa Ana Winds.

(See Riverside County OA MJLHMP Section 5.3.13)

Extreme Weather: Winter Weather - Severity – 2, Probability – 2, Rank 15

Sustained temperatures below freezing in California's generally mild weather regions can cause life loss and health risks to vulnerable populations. Although infrequent, when temperatures reach freezing, this can severely affect California agriculture. Freezing temperatures occurring during winter and spring growing seasons can cause extensive crop damage. (SHMP).

(See Riverside County OA MJLHMP Section 5.3.13)

Tornado - Severity – 2, Probability – 1, Rank 22

The area around the intersection of the 60 Freeway and the 215 Freeway has been the location in the City where two separate tornados events (rated F1) and a funnel cloud have occurred. In the May 22, 2008, incident, two tornados were observed together in the same area.

(See Riverside County OA MJLHMP Section 5.3.17)

Power Outage - Severity – 2, Probability – 3, Rank 7

The City of Riverside operates its own electric utility service and distributes electricity to more than 105,000 residential, commercial, and industrial customers. The City has one primary connection from the State Grid into the City's power grid. The loss of this primary electrical source completely isolates the City from any outside power supply. As a backup to this single supply source, the City has two cogeneration facilities capable of supplying enough power to support 40% of the City's power needs.

In October 2007, there was a failure of the primary power source, causing a complete loss of power to all customers in the service area. As the cogeneration facilities did come on-line as quickly as anticipated, power was slower to return than anticipated. This outage lasted approximately 6 hours.

The City of Riverside is a member of the CAISO, which controls 75 percent of California's Power Grid. The CAISO controls the flow of power and identifies when there is the need for power providers to reduce their usage. Should there be a notice from the CAISO to the City to reduce usage, the city would reduce usage by using the cogeneration plants to supplement power usage, or if necessary, begin the process of interrupting service on a rotating black-out basis. Power will be turned off in portions of the utility's service area for approximately a half hour and then will be restored—at which time the power will be turned off in another portion of the grid. This rotation will continue until the service can be restored to full capacity.

The City's above ground power lines are susceptible to the high winds that pass through the city. The potential for arcing lines causing sparks to drop onto buildings or brush is a hazard that the utility department continues to address. Traffic accidents where a pole is struck by a vehicle is an on-going occurrence in the city, however, there have been few major fires caused by this type of event.

In addition to the overhead lines, there is a potential for events relating to underground vaults and power lines. These vaults and lines are susceptible to flooding during heavy rains as well as being broken by contractors digging in the streets and on property where underground utilities are used.

(See Riverside County OA MJLHMP Section 5.3.4)

Transportation - Rail/Aircraft/Highway – Severity - 2, Probability – 2, Rank 9

The City's multi-faceted transportation network contains major freeways, rail lines, aircraft routes, and airports.

Highway Transportation

The road systems include the 60 Freeway on the north, the 91 Freeway through the center of the City, and the 215 Freeway along the east. The 91 Freeway ranks as one of the busiest in California. The following data was developed in 2006 (most recently known study) by CalFire when they performed their Highway Hazardous Materials Study.

(See figure 4.5.8 for a map of Ground Transportation Corridors in and adjacent to the City of Riverside).

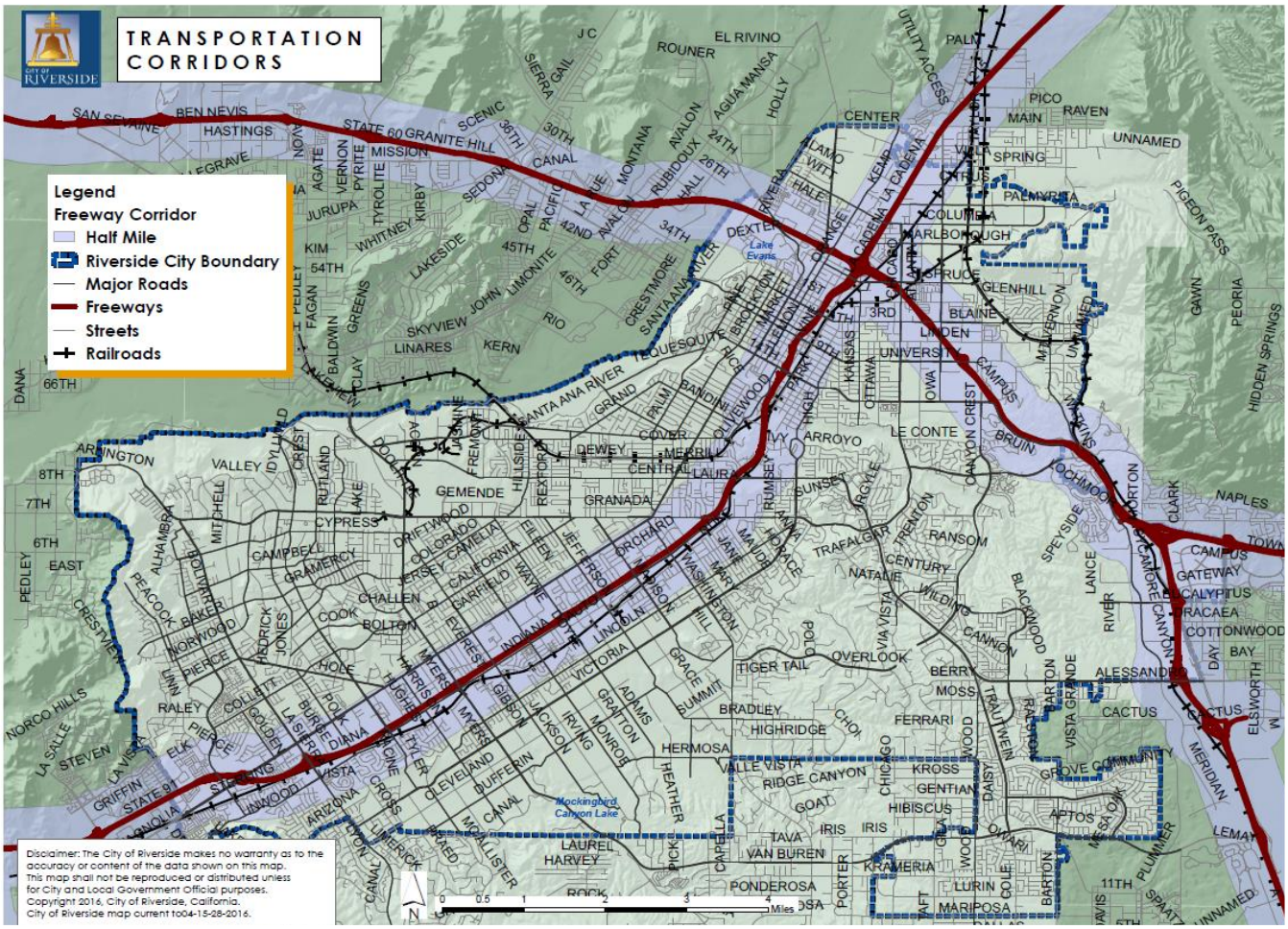
One of the primary study sites in the County used by CalFire in their Hazardous Materials Study (2006) was the 60 Freeway at the Orange Street Overpass in Riverside (only site in the City). Of the study sites, this site had the highest number of commercial trucks (16 per hour) displaying hazardous materials placards. Of those, 63 percent of the bulk hazardous loads were flammable liquids and 2 percent were toxic and/or corrosive substances. In addition to these placarded trucks, there are numerous smaller delivery trucks that carry hazardous materials under the amount that requires placarding.

Additional information shows those existing freeway traffic volumes within the City range from 101,000-125,000 vehicles per day on SR 60, 160,000-197,000 vehicles per day on SR-91, and 151,000-173,000 vehicles per day on I-215.

In addition to the freeways, there are several heavily traveled north-south and east-west connector roadways in the City.

Kaiser Hospital, St. Francis de Sales School, and Sherman Indian High School are located in close proximity to the 91 Freeway. (See Riverside County OA MJHMP Section 5.3.14)

Figure 4.5.8 Ground Transportation Corridors – City of Riverside



Rail Service

The primary hazard with rail service has not been any train vs. train or track derailments. There continues to be many train v. vehicle or train v. pedestrian accidents in the city. These accidents have caused both traffic and rail service delays of up to 6 hours but have not caused any major derailments. The danger with these types of accidents is that they can create train derailments or accidents when the train impacts with a vehicle or when the train engineer attempts to stop the train quickly.

The City of Riverside is served by two main line freight railroads, operating along 17 miles of railroad corridors within the city. The two rail services in the region follow the 91 and 215 Freeways with both passenger and freight service. There are 26 mainline crossings where the railroads intersect with City streets and approximately 128 trains (100 cars per train) pass through the city each day. The Union Pacific (UP) line is the main line from the Pacific Coast to Texas and the Midwest. The Burlington Northern Santa Fe (BNSF) line is the life blood route to the Ports of Los Angeles and Long Beach, and to all parts of the east. A third system, Metrolink, provides commuters a direct route to Los Angeles, Orange and San Bernardino Counties as well as stops in Riverside County. Amtrak, a national rail service, passes through the city, on the route between Chicago and Los Angeles, using the BNSF route, twice per day. Both rail lines are major arteries to the Los Angeles and Long Beach ports. The bulk of the port traffic comes through the Riverside area. Any type of interruption to service would cripple the railroads. In addition to the main line tracks, a variety of railroad spurs and industry tracks are throughout the city. Also, the Riverside Branch line of Union Pacific from downtown Riverside to the Hunter Park area connects with the San Jacinto Branch line near Marlborough, running near the base of Box Springs Mountain.

Figure 4.5.9 Railroads - Schools and Care Facilities – City of Riverside

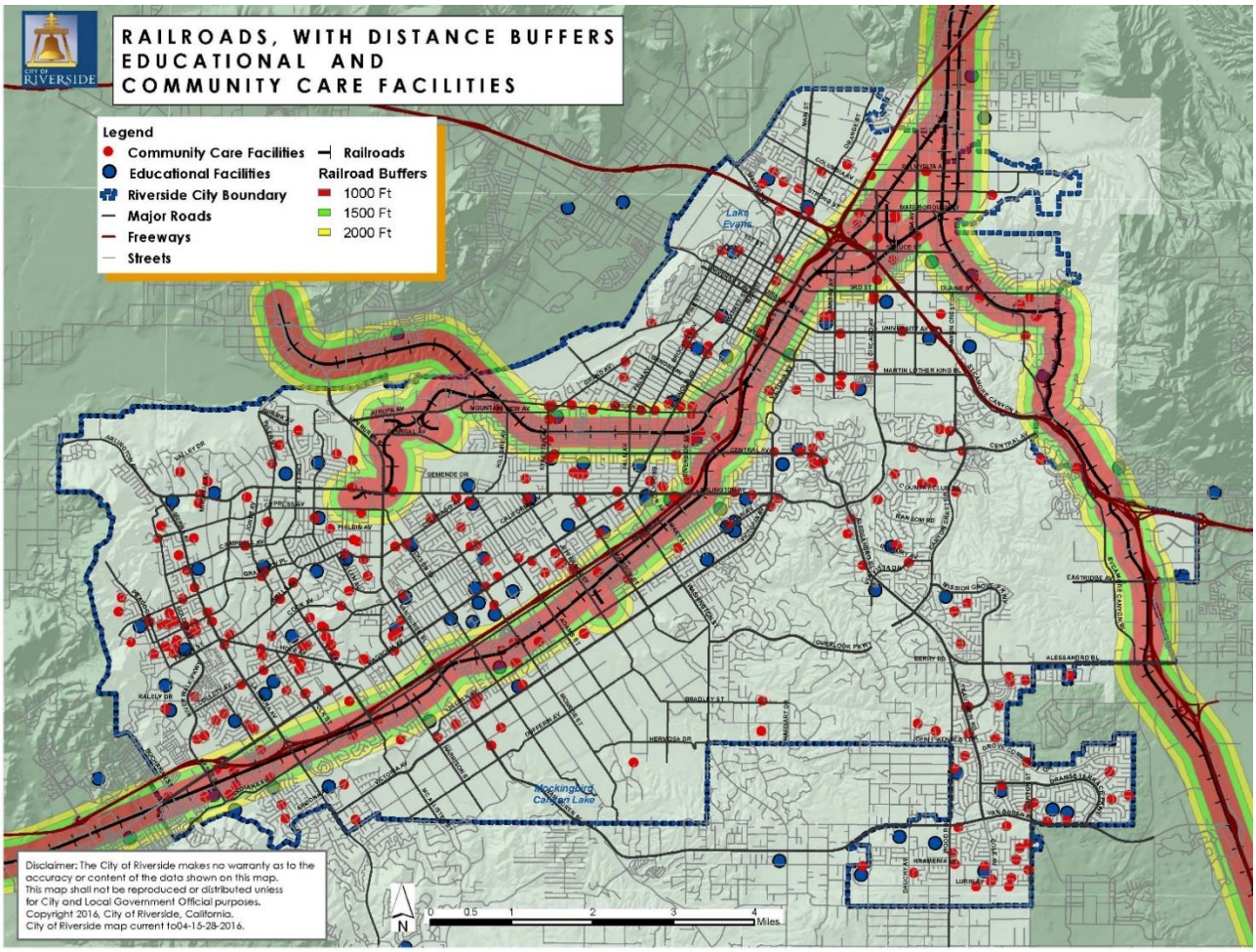


Figure 4.5.10 Public Safety Facilities – Railroads – City of Riverside

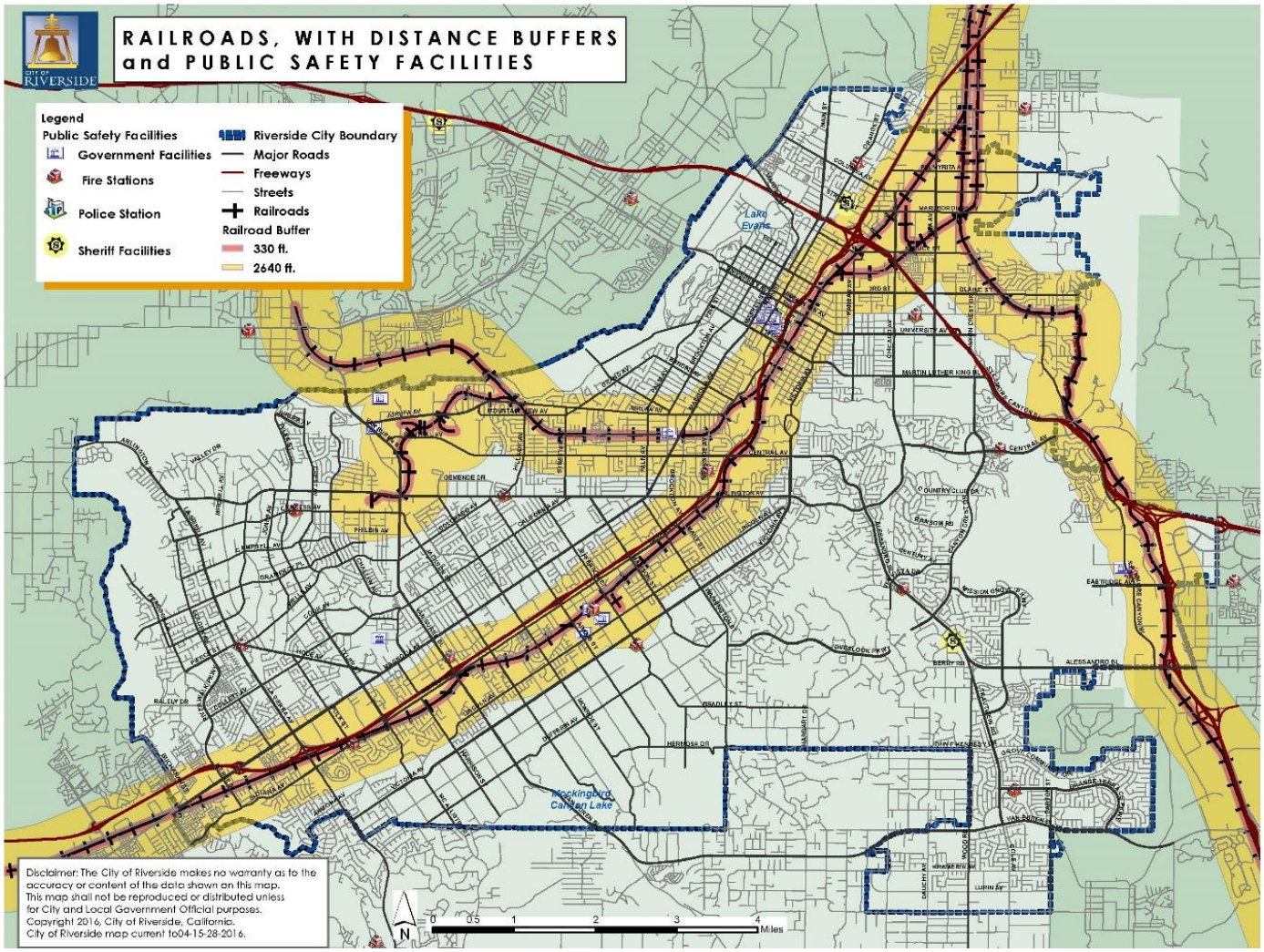


Figure 4.5.11 Schools and Community Services within Mile of Railroad

Airports and Air Transportation

Air transportation hazards not only include our local airports, but also the fact that many of the flight paths into and out of airports such as Ontario, Long Beach, Orange County, LAX, Riverside Municipal, Flabob, Corona, and March Reserve Base, all cross over the city. Only a small number of aircraft accidents have occurred within the sphere of the city, and those are all small planes crashing into the ground. There has been one accident involving a military aircraft that occurred in the March Joint Powers Authority area near the border with the City of Riverside. The potential for a single large commercial or military aircraft crash or some type of mid-air accident is remote but has the potential to cause significant damage and/or death from passengers on the plane and people on the ground. Local airports of interest are:

Ontario Airport

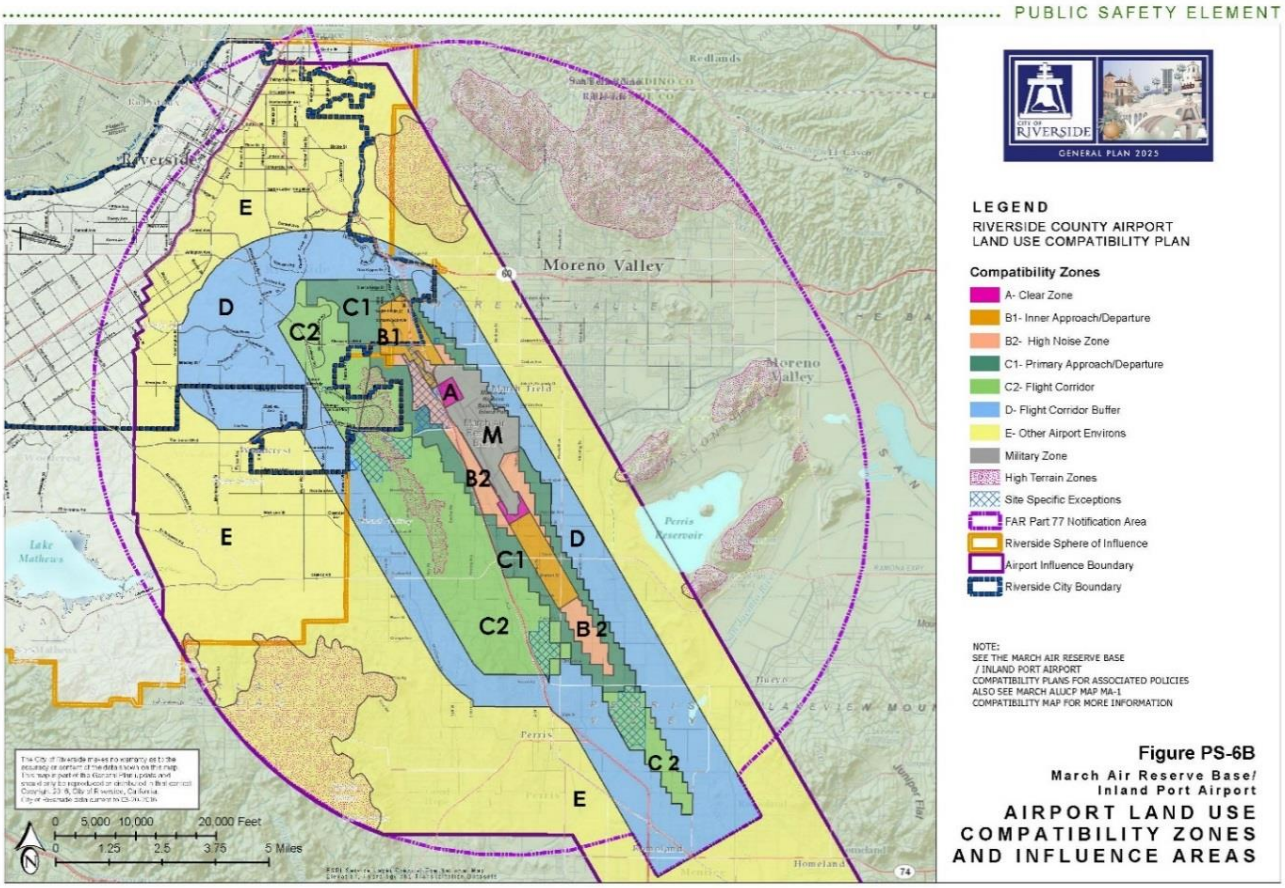
The nearest commercial airport to the City of Riverside is Ontario International Airport located in Ontario, CA. The airport is a combination of cargo and passenger services. It is ranked as the 56th busiest airport nationally in terms of air travel and 10th in cargo.

March Air Reserve Base

This base is located on the easterly border of the City. Once an active Air Force base, it is now a large military reserve base. Activity at the base has increased rather than decreased since its transition to a reserve base. It currently houses the State Air National Guard, Air Force reserve units, federal law enforcement ground and air operations, and most recently is being developed as a joint use facility for civil air cargo operations. One of the primary military missions of the base is the transportation of military personnel to and from overseas locations, usually by commercial carrier. It also houses KC-135 air refueling tankers, F-16 combat jets, and C-17 cargo planes. The KC-135 flights leaving March on missions are carrying a full load of jet fuel, increasing the hazards should one crash off-base in the City. The base is also identified as a FEMA jump-off and landing location for FEMA resources. Although the base does have its own fire agency, the base relies on mutual aid agreements for additional fire and law enforcement assistance.

There has been one major aircraft incident in the March Joint Powers Authority area near the border with the City of Riverside involving an aircraft approaching March Air Reserve Base. The potential remains high as the normal practice path for aircraft is to take off in a northerly direction, turn west traveling over the City, and then land from a southerly direction.

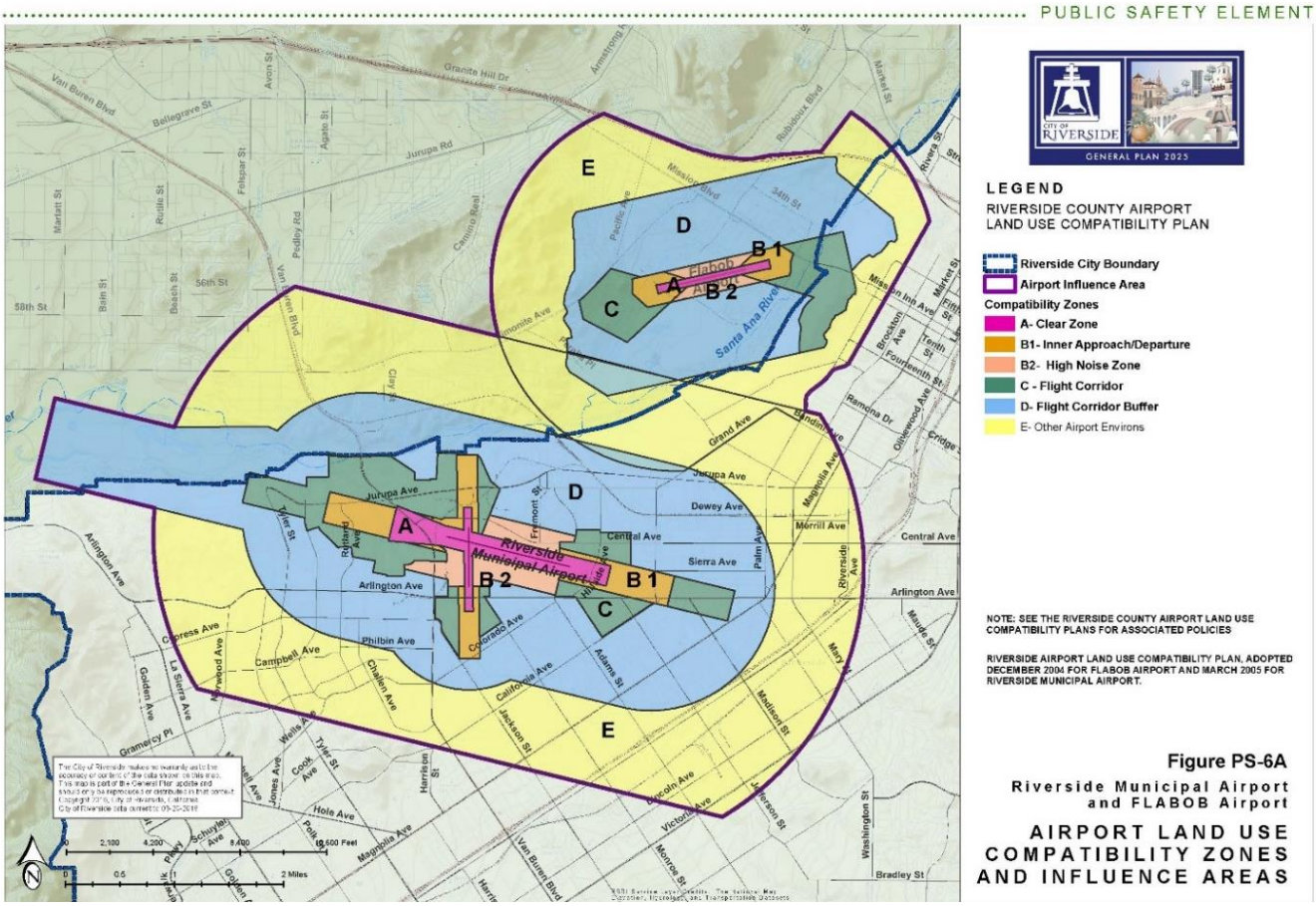
Figure 4.5.12 March Land Use Compatibility Area



Riverside Municipal Airport

This is a general aviation/executive airport with an average of 7000 flights per month. The airport is host to mostly small private and small to medium executive type aircraft but does have the ability to handle a plane up to the size of a 737 or a military C-17. The military practices yearly landing and taking off from the airport. In the past ten years there have been three aircraft crashes near the airport.

Figure 4.5.13 Airport Land Use Compatibility Areas



(See Riverside County OA MJLHMP Section 5.3.14)

Water System - Severity – 2, Probability – 2, Rank 11

The City owns and operates both the drinking water and sewage systems. The various water pipelines running through the City may not be as volatile as a natural gas, petroleum, or aviation fuel line, but as a hazard, these pipelines can cause physical damage to the City's infrastructure, as well as creating a health risk. Many of the City's pipelines are of significant age and subject to breaking.

Besides the impact of an earthquake on these systems, the second greatest concern for both systems is damage caused by contractors digging in the area where there are pipes. Although there are in place ways for contractors to become aware of the locations of

pipelines, many of the incidents have been as a direct result of a contractor's digging or excavating.

Drinking Water Systems

Water Transportation Pipelines

Water transportation pipelines that support Southern California traverse the City. The sizes of these lines range from 20 inches up to as large as 42 inches. Among the pipelines in the area is the Colorado Aqueduct that runs from Parker Dam to Lake Mathews. Damage to one of these lines can cause contamination to the fresh water supply throughout the region as well as disruption of the supply of regional drinking water.

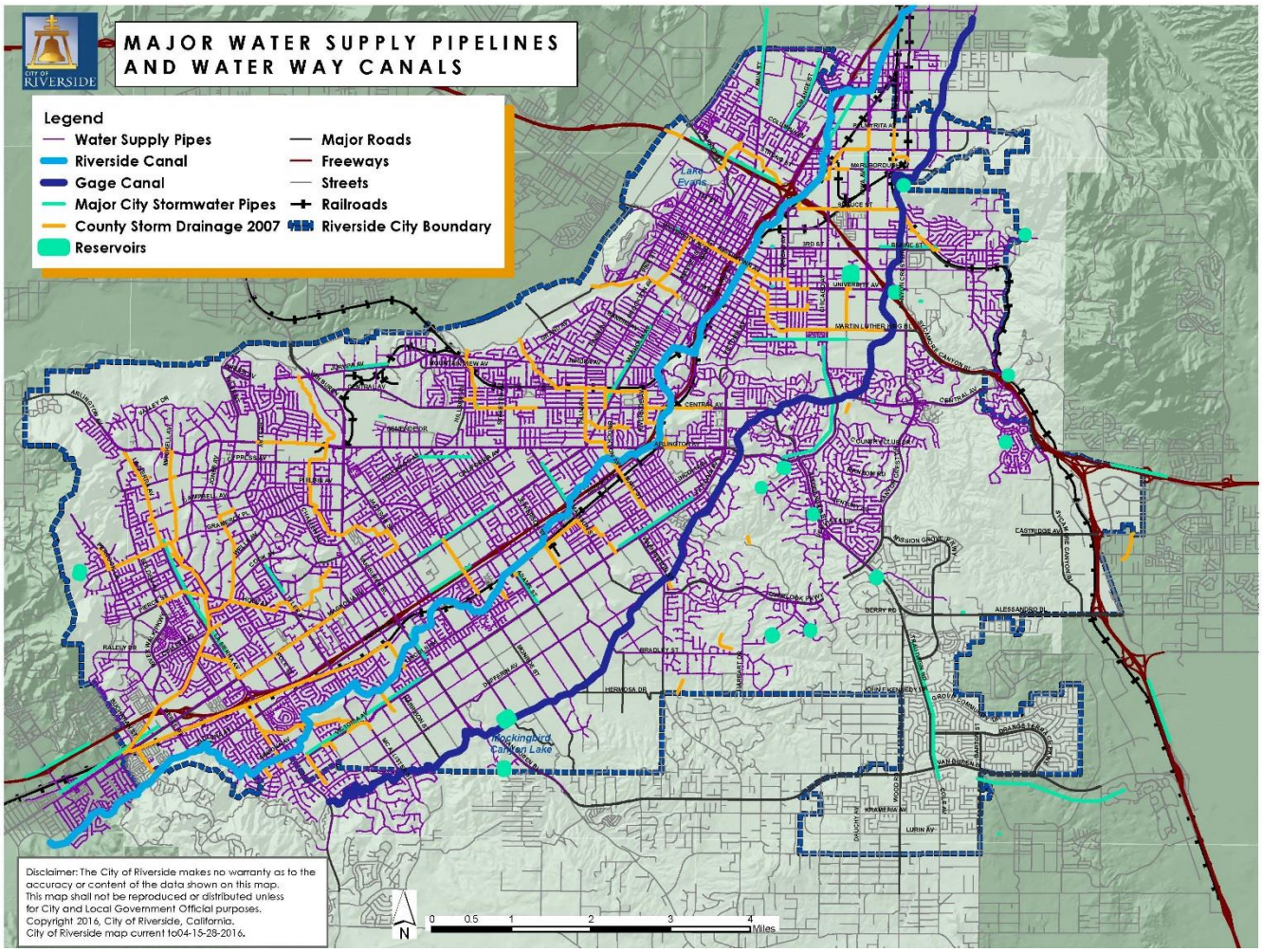
City Drinking Water

The City of Riverside Public Utilities, Water, provides drinking water to approximately 288,000 people mostly within the City. An average of approximately 68 million gallons of water per day are transported and distributed through approximately 967 miles of pipeline and stored in 16 reservoirs. Riverside's water system also includes 10 water treatment plants, 51 domestic wells, 39 booster pump stations and 14 miles of canal. Local drinking water is obtained from water wells located in the City of San Bernardino. The City relies on pipelines running from wells in San Bernardino, across the 10 Freeway, through Grand Terrace and into the filtration and treatment plants. The wells rely on electricity not supplied by the City, but rather Edison. Both the water wells and the local transport water lines are in close proximity to the San Andreas Fault and various rail tracks. These pipelines are subject to damage from earthquakes, flooding, and power outages. Once the water reaches the City, it is either stored in one of the 16 above ground water tanks or closed reservoirs (storage capacity designed to provide one peak day of supply or up to three (3) to five (5) days under emergency conditions) or pushed out to the City through smaller distribution lines. The City's drinking water supply is also the water supply for its fire hydrants. A small portion of the City has water supplied by the Western Municipal Water District.

The Gage Canal/Pipeline

This system of canals and pipelines is the primary source of water for the agricultural industry in the City of Riverside. Should there be a loss of this canal system; there would be a significant impact on the citrus industry in the City of Riverside.

Figure 4.5.14 Water Supply Pipelines and Canals



(See Riverside County OA MJLHMP Section 5.3.20)

Hazmat Incidents – Industrial - Severity – 2, Probability – 3, Rank 14

A hazardous chemical release in the City of Riverside would most likely involve either legal transportation of chemicals by railroad or commercial truck carrier or the handling of chemicals at a licensed facility. Illegal activities such as a clandestine lab or illegal dumping of chemical waste have been identified as threats within the community. The City has not had a major hazmat release or spill in the past 10 years. There have been several illegal labs discovered in the city. The City has one EPA superfund site in the city and two within its sphere of influence. Hazardous materials can be found in three formats: legal/licensed sources, illegal sources, and illegal dumping.

LEGAL SOURCES - These are licensed companies/businesses and common carriers on the roadways. There are approximately 700 licensed hazardous material sites within the City of Riverside. These facilities are a combination of large quantity and small quantity users. Small quantity users are school laboratories, department stores, home improvement stores, etc. Large quantity users include gas stations, chemical production companies, warehouses, and large storage facilities with large refrigeration units. There are locations within the city that use and/or store radioactive material for various medical and research activities. See Figure 4.3.6 Hazardous Material Site Map.

ILLEGAL SOURCES - These situations involve clandestine labs. Many clandestine labs in the area are involved in the production of methamphetamine, but a number of other drugs may also be synthesized, including phencyclidine (PCP), methylenedioxyamphetamine (MDA) and methylenedioxymethamphetamine (MDMA), lysergic acid diethylamide (LSD), methcathinone (CAT), amphetamine, and other controlled substances. Generally, these illegal labs are quite volatile because of the chemicals used and the production methods used. The locations are not constructed in a way to prevent fires, explosions, or toxic releases and the locations are not known to law enforcement or fire. There have been numerous labs of this type located in the city. See Figure 4.5.14- 4.5.15 Hazardous Waste Sites.

Clandestine Dumping

This is the criminal act of disposing of toxic materials and hazardous waste on public or private property. As the costs and restrictions increase for legitimate hazardous waste disposal sites, the number of illegal dumping of hazardous materials has increased proportionately.

Figure 4.5.15 Hazardous Material Site Map – City of Riverside

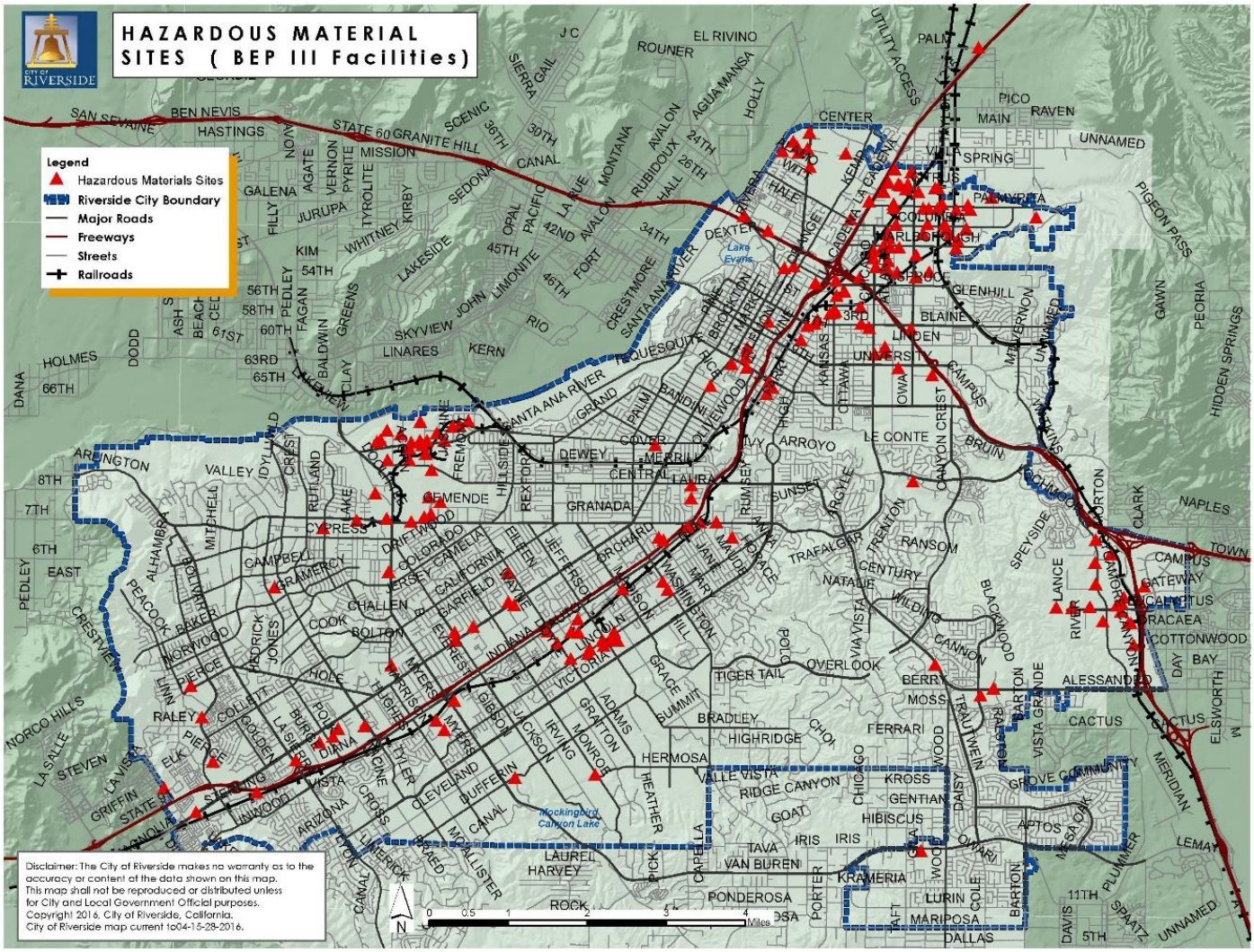
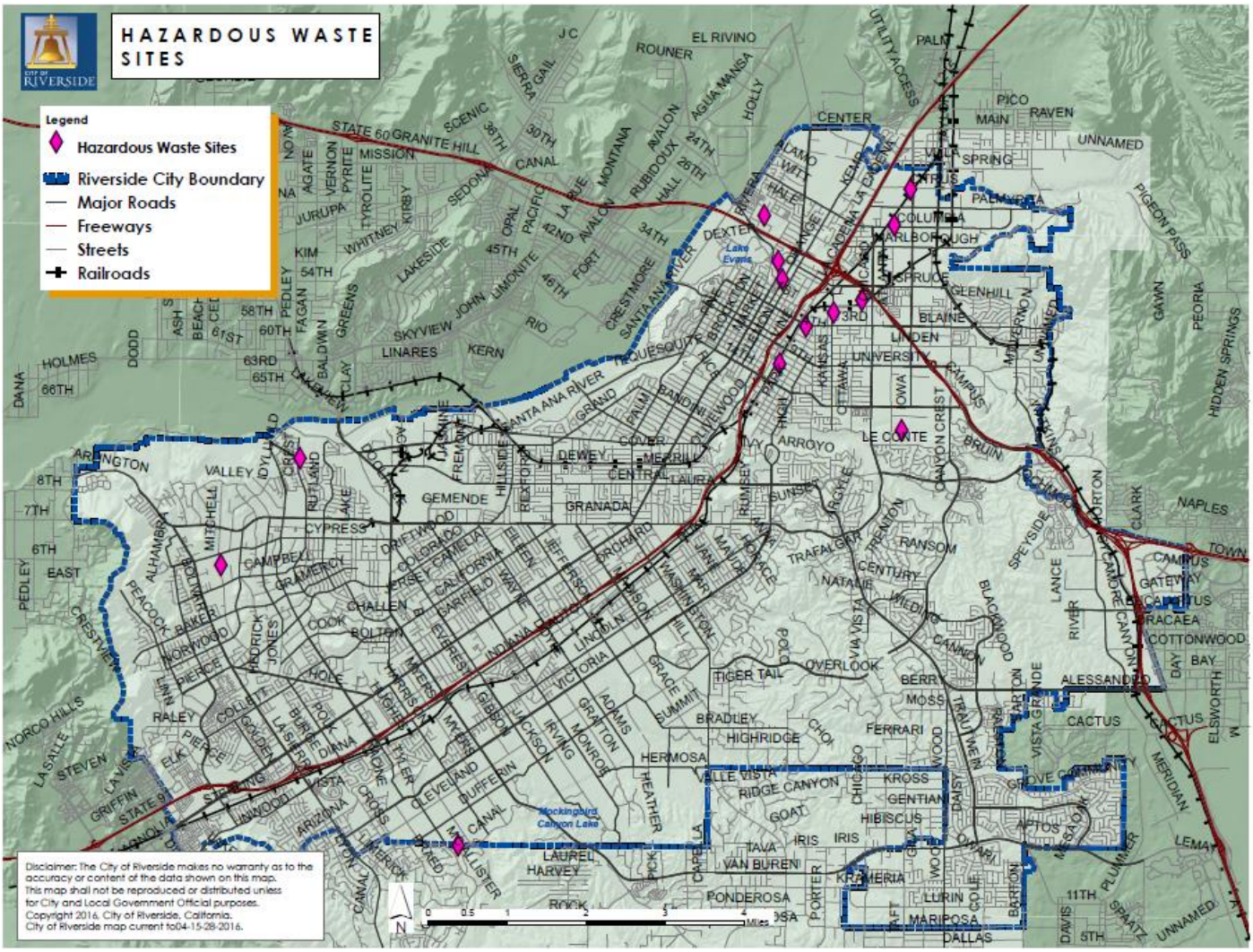


Figure 4.5.16 Hazardous Waste Sites – City of Riverside



(See Riverside County OA MJLHMP Section 5.3.12 and 5.3.22)

Cyber Security- Severity – 2, Probability – 2, Rank 13

The City of Riverside has multiple Critical Infrastructure services that rely on technology and could be vulnerable to a cyber-attack.

1. Denial of service
    a. Public facing websites and internet facing services are vulnerable to denial-of-service attacks disrupting electronic communication capabilities
2. Malicious software
    a. The city has many users utilizing various types of software and computing technologies; aging systems can be exploited to run unauthorized malicious software or grant an attacker access to non-public information
    b. Employees access the internet and email as a part of their daily duties, malicious software, ransomware, phishing, malvertising or exploits could compromise a user or a workstation.
3. Loss, theft or damage of electronic assets
    a. The City's electronic assets are vulnerable to natural, or human caused disasters that could result in service disruption.
    b. Employee's computers and mobile devices can expose sensitive data if lost or stolen.

(See Riverside County OA MJHMP Section 5.3.6)

Gas/Fuel Pipeline Disruption - Severity – 2, Probability – 2, Rank 12

The term "pipeline" relates to natural gas, petroleum, and aviation fuel lines. Besides the impact of an earthquake on these systems, the second greatest concern for these pipelines is damage caused by contractors digging in the area where there are pipes. Although there are methods in place ways for contractors to become aware of the locations of pipelines, many of the incidents have been as a direct result of a contractor's digging or excavating. The specific number and locations of the various high pressure natural gas, aviation, and fuel lines are known by public safety responders, however the specific locations and descriptions are restricted as Law Enforcement Sensitive by Department of Homeland Security requirements. See Figure 4.5.17 Pipelines and Water Way Canals Map displays a rough placement of the pipelines within the City. The following types of pipelines are within the City and are possible hazards.

Natural Gas Lines

Traversing the City are several high-pressure natural gas lines. These natural gas lines are classified into two categories:

Local Distribution Lines:

These lines are designed to provide natural gas into the community for residential and commercial use. These lines usually run down the middle of the street and can be located within the general vicinity of a school, railroad track, or freeway. These pipes are generally the cause of pipeline incidents in the City when they are broken by someone digging in the street. These lines are both cast iron and the new plastic lines.

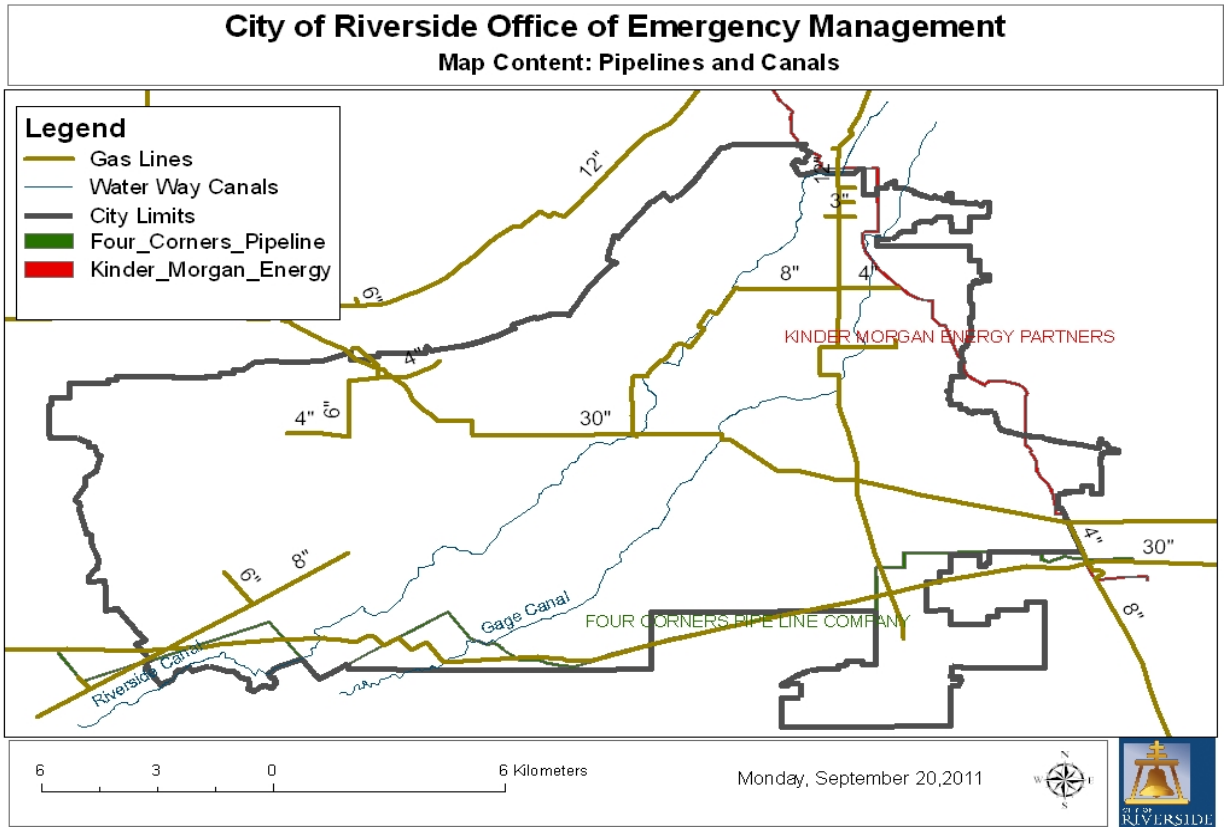
Intra and Inter State Transport Lines:

These pipelines carry natural gas at pressures anywhere from 200 to 1500 pounds per square inch (psi) and are much larger than the local distribution lines. The natural gas in these lines is being transported to locations in and out of the state.

Aviation and Petroleum Lines:

Many of the petroleum lines traversing the city start in the refinery areas in Los Angeles County and provide petroleum projects to the various commercial distribution tank farms and rail centers both locally and out of state. These pipelines range from 6 inches to 14 inches in size. In some instances, these pipelines are within the general vicinity of a school, railroad track, or freeway. Kinder/Morgan runs from Jurupa through the City of Riverside to March Air Reserve Base. The line is 14.53 miles long and it carries Jet-A fuel and refined petroleum.

Figure 4.5.17 Pipelines and Canals



(See Riverside County OA MJLHMP Section 5.3.20)

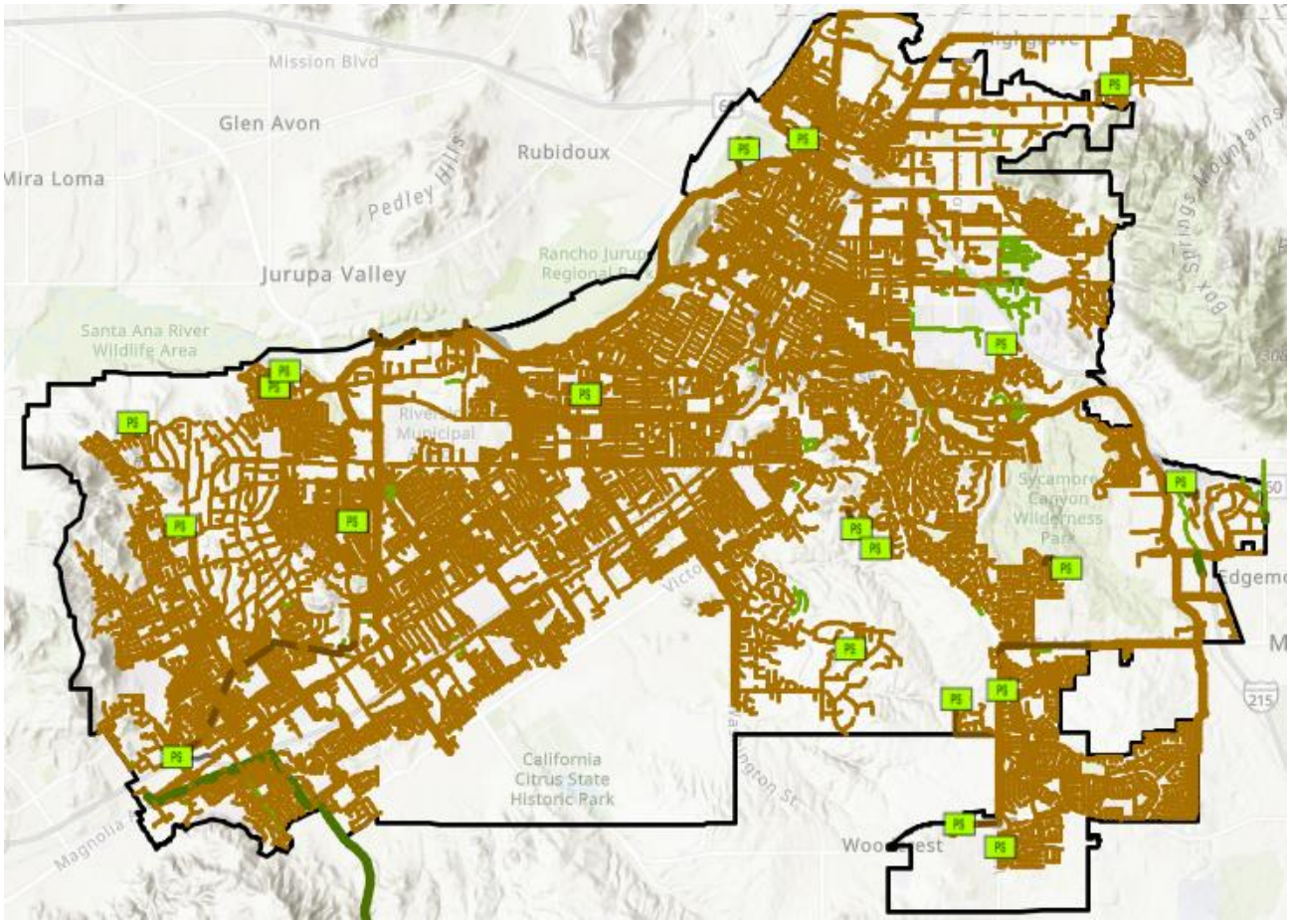
Communications Outage - Severity – 2, Probability – 2, Rank 18

The City's communications systems are vulnerable to natural, or human caused disasters that could result in service disruption. As the home of two emergency communications centers a disruption could not only be an inconvenience but a risk to public safety if 911 communications is down.

(See Riverside County OA MJLHMP Section 5.3.8)

Sewer System - Severity – 2, Probability – 2, Rank 19

Figure 4.5.18 Riverside City Sewer System



Wastewater and rain runoff from Riverside's residential, commercial and industrial contributors is collected through over 820 miles of sewer main and 414 miles of sewer lateral pipelines from 5 basins that drain flow to the treatment plant. The City's sewer pipes are all underground and thus susceptible to being broken by digging in the streets and on property. The City has several events each year where pipelines are damaged in this manner; any resulting disruption of service is minor. These pipelines can cause physical damage to the City's infrastructure, as well as creating health risks. Many of the City's pipelines are of significant age and which can contribute to breakage. Distributed at low points throughout the system are 20 sewer lift stations which collect wastewater and pump it to an elevation where it can again gravity flow to the wastewater treatment plant.

Waste Water Treatment Plant

The City's wastewater treatment plant receives wastewater and storm water runoff for treatment. The Riverside Water Quality Control Plant provides treatment of all domestic and industrial wastewater generated within the City and in the Rubidoux, Edgemont, and Jurupa Community Services Districts. There is only one primary collection pipe that collects storm water and carries it to the plant and in heavy rains, the City has experienced sewage backup into the City streets. Once the sewage has been treated, the water is used for recharging the aquifer under the Santa Ana River. Primary power for the plant is supplied through the normal City supplied electrical service and is directly connected to one of the City's cogeneration plants should there be a loss of primary power. The wastewater treatment plant also has six stationary emergency diesel generators to provide power in the event of a complete outage. Many of the plants pipelines and treatment systems are old, which has caused issues in the past. The plant does not use liquid chlorine as part of its processing.

Pandemic/Disease/Contamination - Severity – 3, Probability – 3, Rank 8

A disease outbreak can cause illness and result in significant casualties. Since 1900, there have been three influenza pandemics that killed approximately 600,000 people in the United States. The 2009 H1N1 flu, first identified in Imperial and San Diego counties, killed more than 550 Californians, sent thousands more to hospitals, caused widespread fear and anxiety and the declaration of a public health emergency. H1N1 in 2009 tested the State's medical infrastructure as never before. H1N1 quickly spread nationwide and then around the globe, taking a heavy toll on people not usually susceptible to serious influenza.

Dam Failure/Inundation - Severity – 2, Probability – 1, Rank 17

Although very unlikely, a catastrophic uncontrolled release of water from a dam would devastate large portions of the City. The event would more likely be a situation of a dam overtopping where water behind the dam sloshes over the top of the dam as a result of an earthquake or heavy rains or a higher-than-normal release of water from the dam to prevent overtopping or dam damage. This usually happens in heavy rain. The City has had events related to high water releases. Because most of the City's dams/reservoirs have little or no levee systems downstream, the flow of water would be mainly uncontrolled. There are nine dams in the City of Riverside area. They are Alessandro Dam, Mary Street Dam, Box Springs Dam, Harrison Dam, Lake Matthews Dam (Dike 1 and 2), Mockingbird Canyon Dam, Prenda Dam, and Woodcrest Dam. All the dams except for Lake Mathews are made of compacted earth. Lake Matthews Dam (Dikes 1 and 2) has concrete faces to prevent wash action. Of these dams, Mockingbird Canyon

and Lake Matthews could have a significant impact on the City in the event of a dam event.

Figure 4.5.19 Dam Inundation Zones – City of Riverside

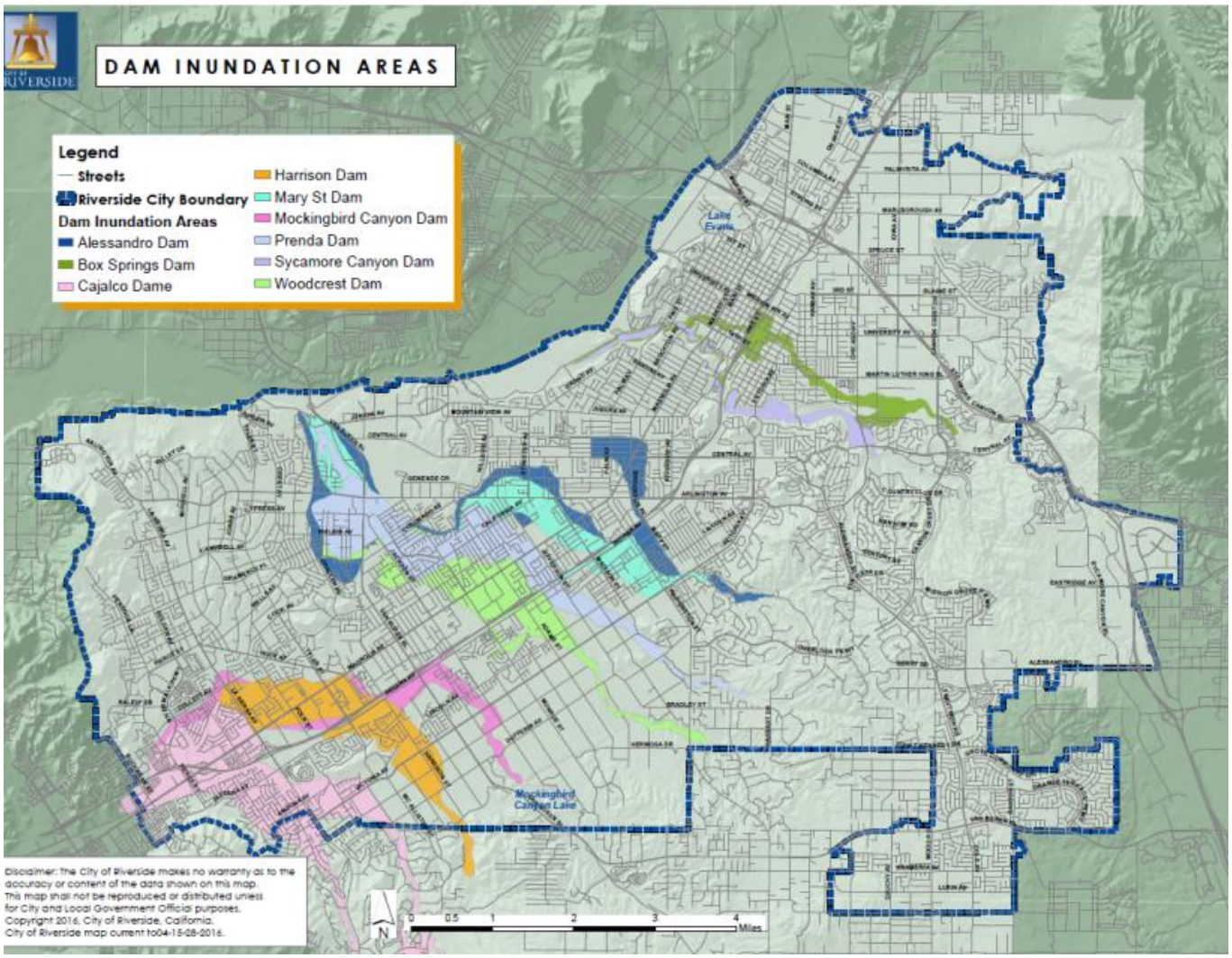


Figure 4.5.20 Dam Inundations Zones – Schools and Care Facilities – City of Riverside

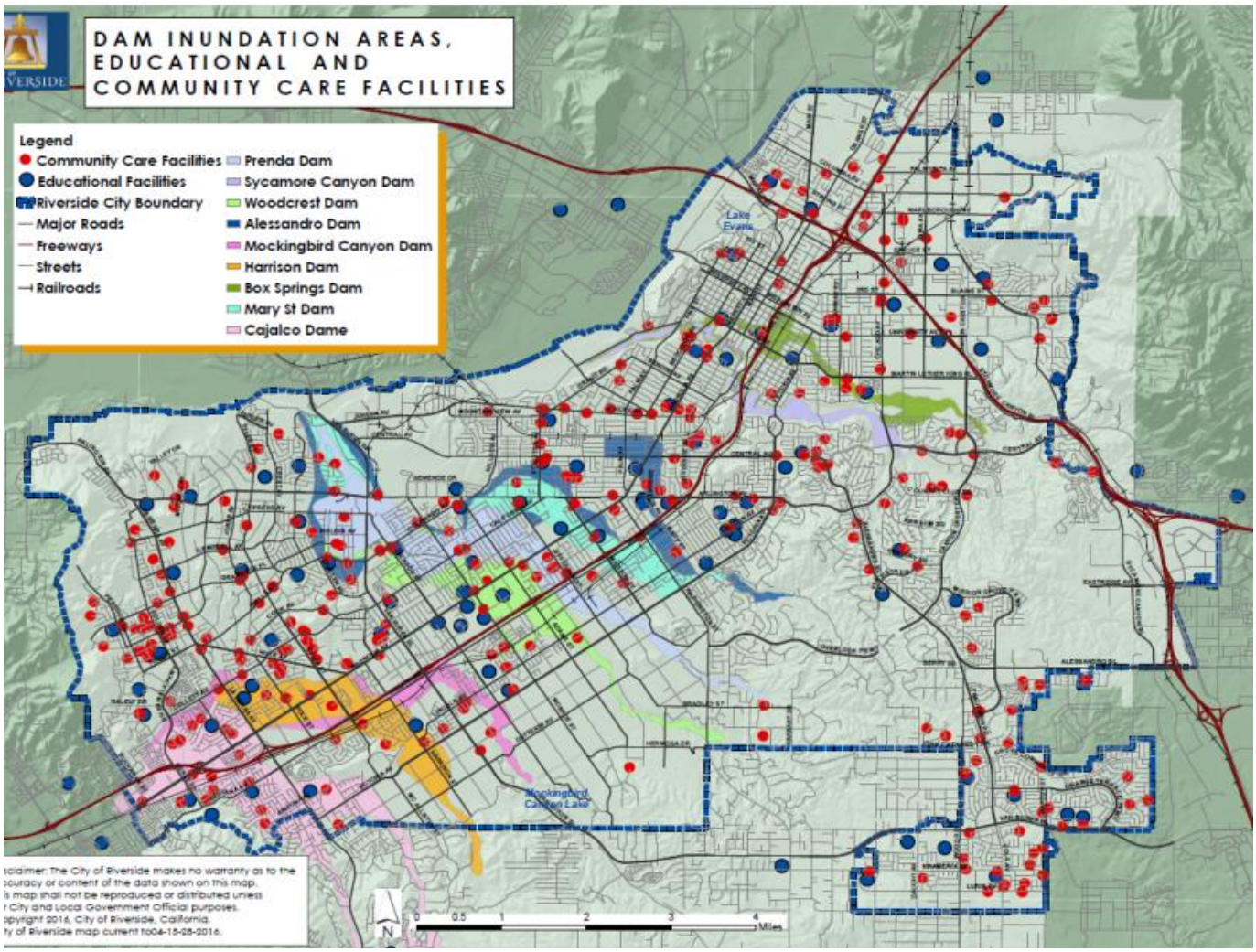
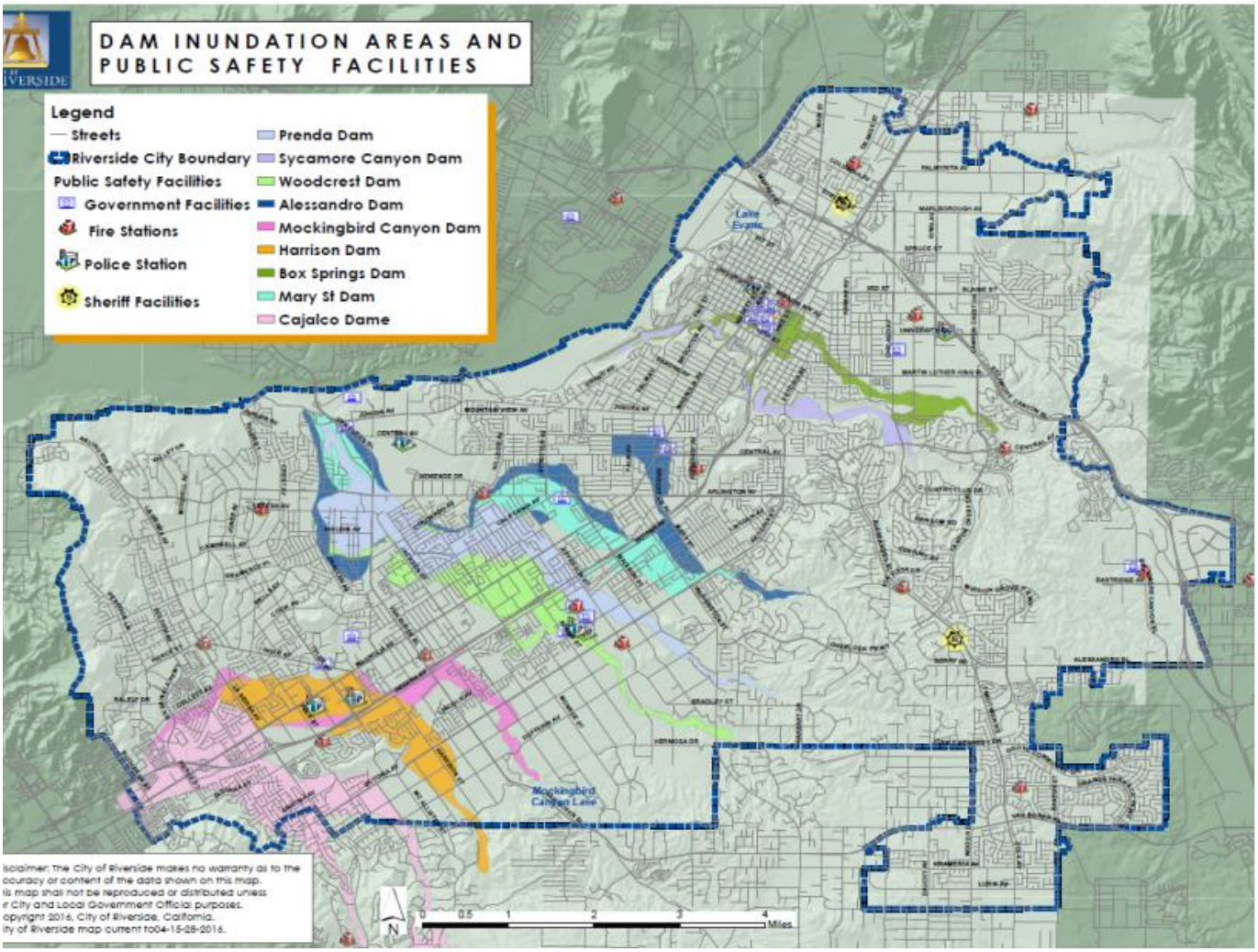


Figure 4.5.21 Dam Inundation – Public Safety Facilities – City of Riverside



(See Riverside County OA MJLHMP Section 5.3.15)

Insect Infestation - Severity – 2, Probability – 2, Rank 20

Insect infestation occurs when an undesirable type of insect inhabits an area in a manner that causes serious harm to cash crops, livestock, or poultry; wild land trees, plants, or animals; or humans. Countless insects live on, in, and around plants, animals, and humans in all environments. Many are harmless, while others can cause fatal damage. Under some conditions, insects that have been present and relatively harmless can become hazardous. For example, severe drought conditions can weaken trees and make them more susceptible to destruction from insect attacks.

Insect infestation is an ongoing threat to agriculture and public health. The effects on people and property can be disastrous and costly.

(See Riverside County OA MJLHMP Section 5.3.18)

Civil Unrest - Severity – 2, Probability – 2, Rank 16

The City has been the focal point of numerous civil protests over the past ten years. Although none of these have been overly violent or caused major property damage, the potential for large-scale events is always present. Most of the events fall under the classification of civil protest (picketers, etc.) rather than civil unrest (mobs, looting, property damage, etc.). With the large number of facilities located in the City that represent Federal, State, and Local governments, along with the various colleges and universities, Riverside has averaged some type of protest on a monthly basis.

(See Riverside County MJLHMP Section 5.3.10)

Landslides/Liquefaction - Severity –1, Probability – 1, Rank 21

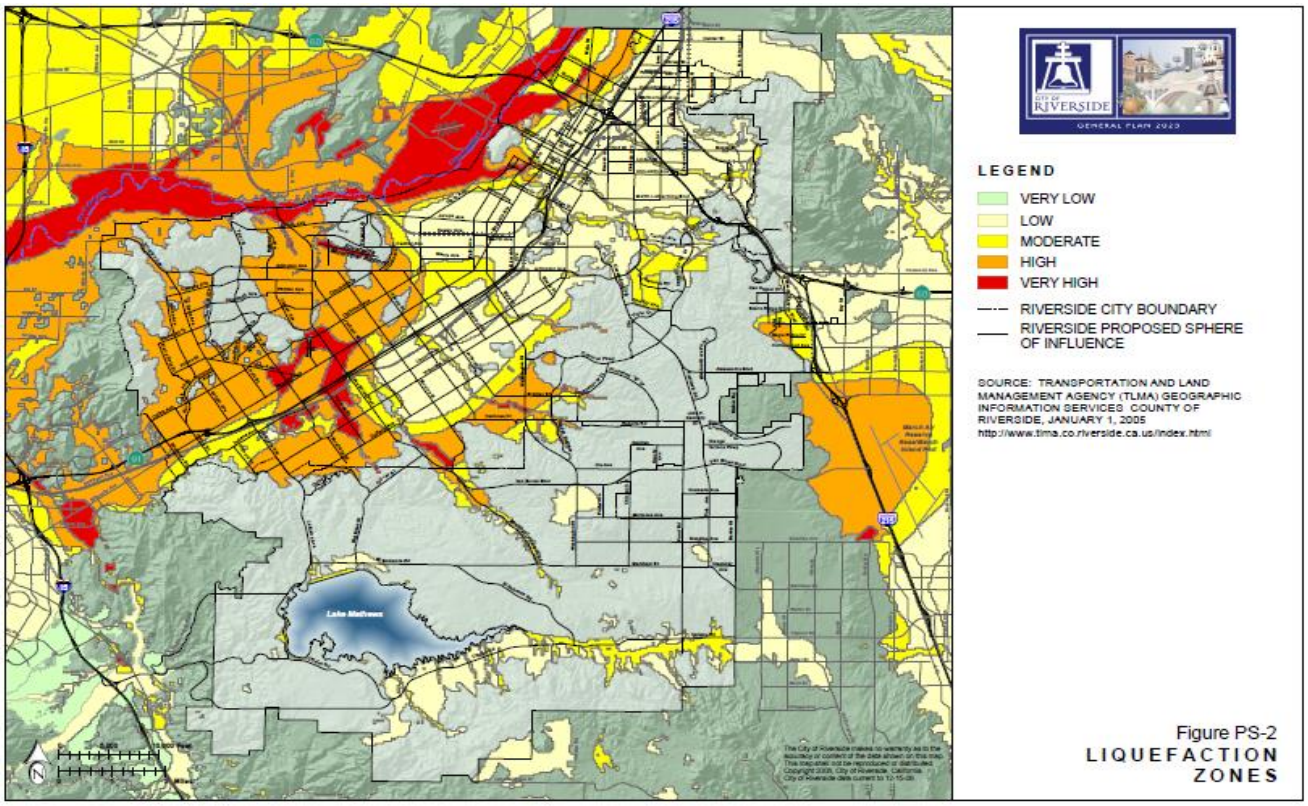
Liquefaction and natural ground failures are a phenomenon generally associated with earthquakes. The City has had many small ground failures (landslides and sink holes) generally associated with heavy rains. Liquefaction and related phenomena is when the strength and stiffness of a soil is reduced by earthquake shaking or other rapid loading.

There are four primary liquefaction areas in the City. These include the area along the Santa Ana River, a wide area south and west of the Riverside Municipal Airport, part of western Riverside spanning La Sierra Avenue and a smaller area along the City's southern boundary. Most of the Sphere of Influence area is not susceptible to liquefaction, except for alluvial drainages leading into Lake Mathews.

(See Figure 4.4.21 Liquefaction Zone Map.)

Within Riverside, most natural slopes are relatively flat, generally less than fifteen percent, with some slopes ranging from fifteen to more than thirty percent in the southeastern and western portions of Riverside. Principal areas of steep slopes include the Box Springs Mountains, Alessandro Heights, Hawarden Hills and the east-facing slopes of the Norco Hills. Many slopes in the Sphere of Influence are steeper than those within the City. The portions of Riverside susceptible to landslides and rock falls include areas in western and northeastern Riverside. Land sliding may result from heavy rain, erosion, removal of vegetation, seismic activity or combinations of these and other factors.

Figure 4.5.22 Liquefaction Zones



(See Riverside County OA MJLHMP Section 5.3.21).

Nuclear/Radiological Incidents –- Severity – 2, Probability – 1, Rank 23

Radioactive materials are routinely transported in California. These materials include medical and industrial sources, as well as wastes that have radioactive components. Many of the radioactive waste shipments come from research and cleanup efforts at national laboratories. Radiological accidents that result in the release of radioactive materials may result in long-term health risks and contamination of the state resources, including air, water supply, groundwater, and agricultural lands.

The City of Riverside is located within the 35 and 50-mile Emergency Planning Zones of San Onofre Nuclear Generating Station (SONGS). SONGS was a power plant jointly owned by Southern California Edison, San Diego Gas and Electric, and the cities of Riverside and Anaheim. As of 2017 SONGS is in decommissioning process.

The Nuclear Regulatory Commission defines two emergency planning zones around nuclear power plants for planning purposes in the case of an accident: The City lies within the Ingestion Pathway Zone.

Emergency Planning Zone (EPZ)

The federal government requires that communities within approximately 10 miles of a nuclear power plant be included in an EPZ Plan that provides for a plume exposure pathway zone with a radius of 10 miles (16 km), concerned primarily with exposure to, and inhalation of, airborne radioactive contamination.

Ingestion Pathway Zone (IPZ)

An ingestion pathway zone of about 50 miles (80 km) is concerned primarily with the ingestion of foods and liquids contaminated by radioactivity. The purpose of this zone is to prevent the accidental ingestion of deposited radioactive materials by humans and livestock.

(See Riverside County OA MJLHMP Section 5.3.12).

Jail/Prison Incident - Severity – 1, Probability – 2, Ranking 24

Vulnerability due to presence of county correctional facilities being located within the city.

(See Riverside County OA MJLHMP Section 5.3.19).

Table 4.5.3 Major City Related Incidents 2000 to 2021

Disaster/Incident	Significant Incidents/Facts/Comments
Earthquake 5.0 or larger	Ridgecrest M6.4 7/4/2019, M7.1 7/6/2019 Chino Hills M5.4 7/29/2008 No major damage reported from local earthquakes.
Wildland Fire (20 acres or more)	Presidential Declarations - DR 1810, 1731, 1498 FMAG – 46 Fire 10/31/2019
Flooding	Presidential Declarations – 2005: DR-1577, DR-1585 2010: DR-1884, DR-1952 2013: 8/29/13 Rain Event 2014: September 7 Rain Event 2017: DR-4305 2019: DR-4431
Winter Weather	4/5/06 Severe hailstorm in Riverside-Corona area Extreme Cold – 1/12/07 – 1/18/07 -Extended extreme cold causing major citrus damage in City 2/22/23 – 2/25/23 Large Regional Winter Storm with water rescues
Extreme Heat	Extreme Heat 9/1/02 - 112 Degrees 6/18/16 -111 Degrees 9/5/20 - 116 Degrees 9/6/20 - 117 Degrees
Severe Wind/Tornado	Funnel Cloud – 1-9-05 Riverside/Jurupa area Tornados 5-5-06 - In the area of 215/60 Fwy 5-22-08 - 215/60 Fwy 4 separate tornados causing 9 car train derailment, on the ground for approximately 15 minutes Wind: 9/8/15 Wind knocked down several trees and power poles 3/11/16 Strong wind downed trees and power lines.
Pandemic/ Disease/Contamination/Infestation	2004-2005 - West Nile Disease requiring the destruction of chicken flocks Ongoing Citrus greening disease from Asian Citrus Psyllid 2020 – DR-4482 COVID-19 Pandemic
Sewer System Failure or Damage	Primary cause was contractor working in the area
Major Gas/Fuel Pipeline	5-11-04 - Natural Gas Line over 60 Fwy @Blaine Construction workers cut gas main causing evacuation of 5,000 residents and student dorms at UCR for approximately 6 hours
Transportation Incidents/Accidents – Rail/Aircraft/Highway	Primary accidents were train v. pedestrian and train v. vehicle, resulting in several fatalities. No train v. train incidents have occurred. Small plane crashed ¼ mile from airport, February 27, 2008. Small plane crashed into neighborhood July 26, 2015. Small plane crashed into neighborhood February 27, 2017. F-16 crashed into warehouse in March JPA May 2019.
Power Outage	03-01 Rolling Blackouts –for three days

	10/25/07 Total blackout of the entire City lasting approximately 6 hours 8/14-15/20 Rolling Blackouts due to Heat Wave
Dam Inundation	12-22-10 - Release of a high volume of water from Sycamore Canyon Dam during heavy rains resulting in the complete roadway washout - Chicago Ave @ Central
Hazmat Accidents Industrial	6/25/07 Major Fire at Hazmat Site closing the 60 Fwy for 4 hrs.

Sources: (1) City of Riverside Fire and OEM Incident History (2) San Diego National Weather Service

SECTION 5.0 – COMMUNITY RATING SYSTEM

5.1 REPETITIVE LOSS PROPERTIES

While the City of Riverside has no NFIP insured structures that have been repetitively damaged. The following are repetitive flooding areas that in many cases have caused repetitive damage:

- 14th Street and Highway 91
- Arlington Avenue and the railroad tracks
- Van Buren Avenue and Indiana Avenue
- Mount Rubidoux Park
- Fairmount Park
- Lake Evans
- Downtown Area
- Don Derr Park
- University Avenue at the railroad tracks

5.2 NATIONAL FLOOD INSURANCE PROPERTIES

The City participates in the National Flood Insurance Program.

Describe participation in NFIP, including any changes since previously approved plan. The City of Riverside has participated in the National Flood Insurance Program since 1982. The current Flood Insurance Rate Map (FIRM) was effective beginning August 28, 2008, with Letters of Map Revisions (LOMR) occurring 02/26/2010, 08/27/2010, 07/26/2011, 09/02/13, and 03/20/17.

a. **Date first joined NFIP**. 1982
b. **Identify actions related to continued compliance with NFIP**.
When construction and plans are reviewed all projects are checked for compliance with the City's Floodplain Management Program. No projects are issued Grading or Building Permits unless it complies. The City coordinates its floodplain activities with

the Riverside County Flood Control District, which is the primary flood management agency in the County.

c. **CRS member?** No
d. **CRS class?** n/a
e. **Describe any data used to regulate flood hazard areas other than FEMA maps**. Riverside Municipal Code 16.18
f. **Have there been issues with community participation in the program?** No
g. **What are the general hurdles for effective implementation of the NFIP?** None

i. **Summarize actions related to continued compliance with NFIP**

When construction and plans are reviewed all projects are checked for compliance with the City's Floodplain Management Program. No projects are issued Grading or Building Permits unless it complies. The City coordinates its floodplain activities with the Riverside County Flood Control District, which is the primary flood management agency in the County.

ii. **Repetitive Loss Properties**

The City of Riverside has no NFIP insured structures that have been repetitively damaged by floods.

SECTION 6.0 - CAPABILITIES ASSESSMENT

The planning team performed an inventory and analysis of existing authorities and capabilities called a "capability assessment." A capability assessment creates an inventory of a jurisdiction's codes, programs and policies, and evaluates its capacity to carry them out. It presents a toolkit for implementing the hazard mitigation plan and for identifying opportunities to increase the City's core capabilities to support mitigation actions. The assessment identifies potential gaps in core capabilities. Filling those gaps may eventually become mitigation actions in the plan. Assessment findings were shared with City departments as they developed the recommended mitigation actions. If a department identified an opportunity to add or expand a capability, then doing so has been identified as a mitigation action. The City views each core capability to be fully adaptable as needed to meet the best interests of the City. This adaptability is an overarching City capability that is acknowledged by this reference. The capabilities are divided into five sections:

- Regulatory Mitigation Capabilities
- Administrative and Technical Mitigation Capabilities
- Fiscal Mitigation Capabilities
- Mitigation Outreach and Partnerships
- Funding Sources

6.1 REGULATORY MITIGATION CAPABILITIES

Departments and organizations have the ability to develop policies and programs and to implement rules and regulations to protect and serve residents. Local policies are typically identified in a variety of community plans, implemented via a local ordinance, and enforced through a governmental body.

The table below lists planning and land management tools typically used by jurisdictions to implement hazard mitigation actives and those that are currently active in the City. The column that indicates “Yes” or “No” defines if the City’s local authority of that capability.

Table 6.1.1 Planning and Regulatory Capability

Regulatory Tool	Yes/No	Comments
General plan	Yes	General Plan 2025 Program for the City of Riverside, adopted 2007 with Public Safety, Housing and Environmental Justice Elements Updated October 5, 2021
Zoning ordinance	Yes	Ordinance No. 6966, November 27, 2007, Riverside Municipal Code Title 19,
Subdivision ordinance	Yes	Ordinance No. 6968, November 27, 2007. Riverside Municipal Code Title 18
Site plan review requirements	Yes	Ordinance No. 6966, November 27, 2007, Riverside Municipal Code Title 19
Floodplain ordinance	Yes	Ordinance No. 6997, July 23, 2008. Municipal Code Chapter 16.18
Other special purpose ordinance (storm water, water conservation, wildfire)	Yes	General Plan – Land Use and Urban Design Element – The Built Environment, Growing Smarter, Updated March 2013. Proposition R and Measure C.
Building code	Yes	Ordinance No. 7612, adopted by City Council on November 22, 2022 and effective January 1, 2023 – Title 24 California Code of Regulations Title 24, 2022 California Building Standards Codes

Fire Department ISO rating	Yes	Rating improved to ISO 1 since 2018 LHMP. Department also became Accredited.
Erosion or sediment control program	Yes	
Storm water management program	Yes	
Capital Improvements Plan	Yes	Adopted August 27, 2013, Five-year plan; updated annually
Economic Development plan	Yes	2014/2015 Economic Development Plan Revised July 2014
Hazardous Materials Area Plan	Yes	Updated February 1, 2018
Local emergency operations plan	Yes	Emergency Operations Plan, 2011, parts updated in 2012, 2016 and undergoing full revision in 2017
Flood Insurance Study or other engineering study for streams	Yes	FEMA FIS 06065CV001C on April 19, 2017

CITY OF RIVERSIDE GENERAL AND ASSOCIATED PLANS

Long-range goals and objectives of physical form and amenity and provides guidance for developmental regulations, such as zoning and subdivision ordinances. The plan has numerous specific plans addressing geographical areas within the City. Major portions of the plan include:

- Air Quality Element
- Circulation and Community Mobility Element
- Education Element
- Historic Preservation Element
- Housing Element
- Land Use and Urban Design Element
- Noise Element
- Open Space and Conservation Element
- Park and Recreation Element
- Public Facilities & Infrastructure Element
- Public Safety Element

6.2 ADMINISTRATIVE/TECHNICAL MITIGATION CAPABILITIES

Legal, regulatory, and fiscal capabilities provide the backbone for successfully developing a mitigation strategy; however, without appropriate personnel, the strategy may not be implemented. Administrative and technical capabilities focus on the availability of personnel resources responsible for implementing all the facets of hazard mitigation. These resources include technical experts, such as engineers and scientists, as well as personnel with capabilities that may be found in multiple departments, such as grant writers. An assessment of administrative and technical capabilities is presented in Table 6.2.1

Table 6.2.1 Administrative and Technical Capability

Personnel Resources	Yes/No	Department/Position
Planner/engineer with knowledge of land development/land management practices	Yes	Community & Economic Development Department – Director
Engineer/professional trained in construction practices related to buildings and/or infrastructure	Yes	City Engineer and Building Official
Engineer with an understanding of natural hazards	Yes	City Engineer and Building Official
Personnel skilled in GIS	Yes	Police, Public Works, Utilities, Planning Department, IT, and Fire
Full time building official	Yes	Building Official
Floodplain manager	Yes	Public Works Department
Emergency manager	Yes	Emergency Services Administrator
Grant writer	Yes	Internal personnel and some use of outside consultants
GIS Data—Land use	Yes	IT
GIS Datalinks to Assessor’s data	Yes	IT
Warning systems/services (Reverse 9-11, outdoor warning signals)	Yes	Everbridge Mass Notification System

6.3 FISCAL MITIGATION CAPABILITIES

Assessing a jurisdiction's fiscal capability provides an understanding of the ability to fulfill the financial needs associated with hazard mitigation projects. This assessment identifies both outside resources, such as grant-funding eligibility, and local jurisdictional authority to generate internal financial capability, such as through impact fees. An assessment of fiscal capabilities is presented in Table 6.3.1.

Table 6.3.1 Fiscal Capability

Financial Resources	Accessible/Eligible to Use (Yes/No)	Comments
Community Development Block Grants	Yes	
Capital improvements project funding	Yes	
Authority to levy taxes for specific purposes	Yes	With voter approval
Fees for water, sewer, gas, or electric services	Yes	Water, electric, sewer, trash
Impact fees for new development	Yes	
Incur debt through general obligation bonds	Yes	With voter approval
Incur debt through special tax bonds	Yes	With voter approval
Incur debt through private activities	No	
Withhold spending in hazard prone areas	Yes	
Other Grants	Yes	Governor's Office of Research and Planning Climate Resilience Grants, Environmental Protection Agency Inflation Reduction Act Community Change Grants

6.4 MITIGATION OUTREACH AND PARTNERSHIPS

Regular engagement with the public on issues regarding hazard mitigation provides an opportunity to directly interface with community members. The Office of Emergency Management (OEM) is responsible for the coordination and management of mitigation activities. It brings together city departments to discuss and provide advice on potential mitigation activities. OEM provides public education to residents and businesses of potential mitigation and prevention strategies they may take to lessen a disaster's impact. The OEM helps identify funding opportunities for departments to implement mitigation.

The City of Riverside has an existing water responsibility program and annual fire safety programs throughout the year at special community events. The City has an automatic aid agreement for fire with the City of Corona and Riverside County Fire. The City is also part of the regional and statewide fire and law mutual aid system.

The City has Increased public enrollment of Riverside Alert. Riverside Alert allows emergency managers, public safety-first responders and utilities officials to rapidly alert and warn the public in the event of emergencies. Increasing the public's awareness in the Riverside Alert program with Community Preparedness Coordinator and improving the enrollment process for this system will enhance Riverside's ability to reach a larger population in the event of an emergency.

The City's Office of Emergency Management is working with Riverside City School District, UCR, and other higher education sites to assist in identifying risk on and around campus sites.

6.5 FUNDING OPPORTUNITIES

The City of Riverside has the same funding opportunities as Riverside County.

(See Riverside County OA MJLHMP Section & Table 7.4)

6.6 OPPORTUNITIES FOR ENHANCEMENT TO CAPABILITIES

The City of Riverside has a high degree of core capability for funding, administrative and technical functions, and public outreach. These capabilities represent opportunities for future integration with this hazard mitigation plan, as referenced in Table 6.2.1. The City has begun this integration process with the concurrent planning efforts for this hazard mitigation plan and the ongoing implementation and update of its general plan.

Fiscal Capabilities: In terms of financial opportunities, the City could prioritize applying for Hazard Mitigation Assistance (HMA) grants, including funding from programs like Building Resilient Infrastructure and Communities (BRIC) and Hazard Mitigation Grant Program (HMGP), as they become available. These grants present significant avenues

for funding mitigation actions aimed at safeguarding critical infrastructure, protecting vulnerable populations, and addressing climate change-induced hazards such as extreme heat, flooding, and other climate-related threats. By prioritizing funding opportunities that address public health hazards, climate resilience, and the needs of vulnerable communities, the City can enhance its overall resilience and preparedness in the face of evolving hazards and climate challenges

Administrative and Technical Capabilities: To enhance hazard mitigation efforts, the City of Riverside could contract or designate a dedicated individual within the Office of Emergency Management (OEM) to oversee hazard mitigation grant opportunities and assessments, ensuring a specialized focus on securing funding for mitigation projects. This Hazard Mitigation Specialist would play a pivotal role in notifying City departments and other entities of upcoming grant cycles, fostering collaboration and maximizing opportunities for collective mitigation efforts.

In addition, the individual would provide invaluable support in tracking and completing essential documents such as Notice of Intent (NOI) applications, grant applications, and final grant management reporting requirements. Their expertise would streamline the process, increasing the likelihood of successful grant acquisition.

Outreach and Education Capabilities: To effectively integrate hazard mitigation information and mitigation projects into city programs, the City has established training opportunities to help inform staff on how best to integrate hazard information and mitigation projects into their programs. The City often works within the Riverside UASI program and with Riverside County EMD to develop the Integrated Preparedness Plan which will incorporate multiple jurisdictions. There are also several financial resources that the City could leverage in the future for funding mitigation training efforts including through Riverside UASI. City staff can attend additional workshops and training regarding grant funding application processes and how to develop successful grant applications under applicable hazard mitigation grants. Understanding the types of projects that can be funded, and the components of a successful application will enhance the chances of a successful grant award.

Planning and Regulatory Capabilities: The City of Riverside will continue with AB2104 compliance. AB 2140 was passed in 2006, this legislation allows California counties and cities to adopt their current, FEMA-approved local hazard mitigation plans (LHMPs) into the Safety Element of their General Plans. This adoption makes the City eligible to be considered for part or all of its local-share costs on eligible Public Assistance funding to be provided by the state through the California Disaster Assistance Act (CDAA). The City LHMP was incorporated into the 2021 Safety Element Update to the General Plan, the City should incorporate the updated 2023 LHMP, this process also ensures further

consistency of each plan and provides an opportunity to reference the LHMP and enhance the capabilities for implementation of goals and objectives of each plan.

SECTION 7.0 - MITIGATION ACTIONS

7.1 MITIGATION GOALS AND OBJECTIVES

Mitigation goals and objectives are intended to represent what the City of Riverside seeks to achieve through mitigation plan implementation. The goals represent the blueprint for the approach chosen by the City to reduce and prevent losses flowing from identified hazards.

Goal 1: Provide Protection for People's Lives from All Hazards

Objective 1.1: Increase the methods of providing timely notification and direction to the public of imminent and potential hazards.

Objective 1.1.1: In addition to the City's emergency notification system, increase the use of the City's and OEM's website and social media pages to provide emergency notification and direction.

Objective 1.1.2: In conjunction with school districts, colleges and universities, ensure that their respective notification system receives City notifications and passes them on.

Objective 1.2: Protect public health and safety by preparing for, responding to, and recovering from the effects of natural or technological disasters.

Goal 2: Protect the Community Through Awareness about Hazards and Associated Vulnerabilities that Threaten Our Communities

Objective: 2.1: Increase public awareness about the nature and extent of hazards they are exposed to, where they occur, what is vulnerable, and recommended responses to identified hazards (i.e. both preparedness and response).

Objective 2.1.1: Create/continue an outreach program, provide educational resources, and develop and provide training.

Objective 2.1.2: Coordinate with local agencies and organizations to educate all residents and businesses to take appropriate action to safeguard life and property during and immediately after emergencies.

Goal 3: Protect the Community Through Community's Capability to Mitigate Hazards and Reduce Exposure to Hazard Related Losses

Objective 3.1: Reduce damage to property from an earthquake event.

Objective 3.1.1: Adopt/maintain building codes to meet required earthquake standards.

Objective 3.1.2: Provide the public with information on how to be prepared for a seismic event and minimize any related damage or threat to health and public safety.

Objective 3.2: Use open space easements and other regulatory techniques to prohibit development and avoid creating public safety hazards where geologic instability is identified and cannot be mitigated.

Objective 3.3: Increase awareness of Mobile Homeowners of the need to retrofit homes using foundation strapping.

Objective 3.4: Increase awareness of non-structural retrofitting through water heater strapping, gas shut off valves, etc.

Objective 3.5: Coordinate efforts between public safety, building officials, city communication staff and others to create innovative public awareness programs.

Objective 3.6: Identify local hazard mitigation projects for inclusion in Capital Improvement Plan (CIP).

Goal 4: Protect the Community from Flood and Storm Related Losses.

Objective 4.1: Identify existing facilities located in the one-hundred-year floodplain, flood inundation areas and known debris flow areas particularly bridges and potential emergency access routes.

Objective 4.2: Provide better collection of real time data related to severe weather events.

Objective 4.3: Reduce localized flooding within the City's storm drain systems.

Objective 4.3.1: Implement better drainage to accommodate heavy rains that cause flooding.

Objective 4.4: Encourage flood control techniques along the Santa Ana River that are harmonious with potential recreational uses in the area

Objective 4.5: Identify local hazard mitigation projects for inclusion in Capital Improvement Plan (CIP).

Goal 5: Protect the Community from Hazards Related to Air, Rail, and Ground Transportation.

Objective 5.1: Minimize the risk of potential hazards associated with aircraft operations at the Riverside Municipal Airport, March Air Reserve Base/March Inland Port and Flabob Airport through the adoption and implementation of the Airport Protection Overlay Zone and the Riverside County Airport Land Use Compatibility Plan.

Objective 5.2: Ensure compatible land uses near March Air Reserve Base/March Inland Port through participation of staff and elected officials in the adoption of the March Joint Land Use Study and the Riverside County Airport Land Use Compatibility Plan.

Objective 5.3: Pursue grade-separated rail crossings as the first level priority for reducing street/rail conflicts

Objective 5.4: Use technology to improve safety at grade crossings that cause the least environmental harm (e.g., automated horn systems).

Objective 5.5: Identify local hazard mitigation projects for inclusion in Capital Improvement Plan (CIP).

Goal 6: Protect The Community from Hazards Related to Wildland Fires.

Objective 6.1: Mitigate existing fire hazards related to urban development, infrastructure, parks and open space.

Objective 6.2: Evaluate all new development to be located in or adjacent to wildland areas to assess its vulnerability to fire and its potential as a source of fire risk.

Objective 6.3: Integrate fire safety considerations in the planning process.

Objective 6.4: Continue to implement stringent brush-clearance requirements in areas subject to wildland fire hazards.

Objective 6.5: Identify local hazard mitigation projects for inclusion in Capital Improvement Plan (CIP).

Goal 7: Maintain Coordination of Disaster Planning

Objective 7.1: Coordinate with changing CalOES/DHS/FEMA regulations and requirements.

Objective 7.1.1: Maintain SEMS (Standardized Emergency Management System) and NIMS (National Incident Management System) training for City personnel.

Objective 7.1.2: Maintain continued Disaster Mitigation Act (DMA) planning.

Objective 7.2: Develop and maintain Emergency Operations and other City-Community plans such as the General Plan, Safety Element, Utilities Plan, etc.

Objective 7.3: Maintain effective, coordinated and up-to-date community-wide emergency response strategies and procedures with allied and cooperating agencies.

Objective 7.4: Ensure that equipment and structures designed to provide emergency disaster services are located and designed to function after a disaster or emergency event or relocate any such structures which are not adequate to provide emergency services.

Objective 7.5: Identify actions to reduce the severity and probability of hazardous occurrences.

Objective 7.6: Reduce the risk to the community from hazards related to geologic conditions, seismic activity, flooding and structural and wildland fires by requiring feasible mitigation of such impacts on discretionary development projects.

Objective 7.7: Identify local hazard mitigation for inclusion in Capital Improvement Plan (CIP).

7.2 MITIGATION ACTIONS

In order to achieve the mitigation goals and objectives above, the City of Riverside has identified a comprehensive series of supporting actions that are focused on reducing vulnerability and maximizing loss reduction. The actions can typically be broken out into the following types of activities:

- **Plans and Regulations**. Regulatory actions or planning processes that result in reducing vulnerability to hazards.

• **Assessments and Studies**. Actions taken to better understand the potential impacts of identified hazards. An example would be seismic studies of City facilities.

• **Infrastructure/Capital Projects**. Actions taken to modify existing buildings or structures to protect them from a hazard.

• **Non-Structural Mitigation Measures**. Physical actions taken that don't include structural modifications. An example would be efforts to secure furniture or installation of backup generators.

• **Natural Systems Protection**. Actions that, in addition to minimizing hazard losses, preserve or restore the functions of natural systems.

• **Education and Awareness**. Actions taken to inform and educate residents, elected officials, and property owners about hazards and potential ways to mitigate them.

Sections 7.3 and Appendix C Capital Improvement Plan (CIP) for past mitigation, identify ongoing mitigation and proposed future mitigation actions.

7.3 MITIGATION ACTIONS PROGRAMS

In 2018, the City of Riverside identified Mitigation Actions for the top priorities facing the City. These actions were reviewed for the current update, and for each action details of the projects are listed below. Additional Mitigation Actions that may affect the City and its hazards are included in the Riverside County OA MJHMP Section 4.3.2 and Riverside CIP.

Table 7.3.1 Update of 2018 Local Hazard Mitigation Actions

2018 Local Hazard Mitigation Actions Carried Over					
Mitigation Action	**Lead**	**Hazard**	**Cost**	**Timeframe**	**Funding**
Hunter Substation Seismic Upgrade/Retrofit	Riverside Public Utilities	Earthquake	$ 50,000,000.00	2-5 years	City Funding
Techite Pipe Replacement	Riverside Public Utilities	Earthquake	$ 30,000,000.00	10 years	Bond State Revolving Funds
Evaluation of Drinking Water System	Riverside Public Utilities	Earthquake	$ 1,000,000.00	1-3 years	City Funding, Drinking Water State Revolving Fund, Pre-disaster Mitigation Grant
Riverside Transmission Reliability Project	Riverside Public Utilities		$ 185,000,000.00	2-5 years	Joint: City & Edison Funding
Museum Retrofit	Riverside Metro Museum	Earthquake	$ 225,000.00	1-3 years	Pre-Disaster Mitigation Grant, CA Cultural & historical Endowment Planning Grant, Charitable Foundations
Increase Water Saving Measures	Riverside Public Utilities	Drought	$ 5,000.00	1-5 years	City Funding, Conservation Charge
Tree Trimming Program	Riverside Public Works - Urban Forester	Floods	$ 25,000.00	1-5 years	City Funding and Measure Z
Cool Center/ Warming Center Program	Riverside Parks, Recreation & Community Service	Drought	$35-50,000	Annually	City Funding
Increase Flood Awareness	OEM	Flood	$ 1,000.00	3-5 years	City Funding
Raise Levee Between WQCP & Santa Ana River	City of Riverside Public works	Flood	$3.5 - $3.8 Million	6-9 months	City Funding
Terrorism Training Strategies	UASI	Terrorism	$ 1,200,000.00	1-2 years	Homeland Security Grant

Table 7.3.2 2023 Local Hazard Mitigation Actions

2023 Local Hazard Mitigation Actions					
Mitigation Action	**Lead**	**Hazard**	**Cost**	**Timeframe**	**Funding**
Hunter Substation Seismic Upgrade/Retrofit	Riverside Public Utilities	Earthquake	$ 42,905,666.67	2-5 years	City Funding
Techite Pipe Replacement	RPU	Earthquake	$ 44,582,238.10	11 years	Bond State Revolving Funds
Evaluation of Drinking Water System	RPU	Earthquake	$ 46,258,809.52	1-3 years	City Funding, Drinking Water State Revolving Fund, Pre-disaster Mitigation Grant
Riverside Transmission Reliability Project	RPU	Earthquake	$ 47,935,380.95	2-5 years	Joint: City & Edison Funding
Increase Wildfire Risk Awareness	Riverside Fire Department	Fire	$ 70,000.00	1-2 years	City Funding Pre-Disaster Mitigation Grant
Retrofit of Critical Rail & Street Infrastructure	Riverside Dept. of Public Works	Fire	$35 Million	4-5 years	State and Federal Grants Local Transportation Funds
Facility Back-up Power Supply	Riverside Public Utilities	Drought	$ 16,100,000.00	3-5 years	Cal OES Grant, Drinking Water State Revolving Fund, Hazard Mitigation Grant Program
Museum Retrofit	Riverside Metro Museum	Earthquake	$ 49,611,952.38	1-3 years	Pre-Disaster Mitigation Grant, CA Cultural & historical Endowment Planning Grant, Charitable Foundations
Increase Flood Awareness	OEM	Flood	$ 51,288,523.81	3-5 years	City Funding
Raise Levee Between WQCP & Santa Ana River	City of Riverside Public works	Flood	$3.5 - $3.8 Million	6-9 months	City Funding
Clear water Generating Station Flood Prevention	City of Riverside RPU/ Energy Div	Flood	$ 50,000.00	1 year	Capital Improvements Plan, Hazard Mitigation Grant

Mitigation Action Project Details

1. Hunter Substation Seismic Upgrade/Retrofit

Issue/Background: Hunter Substation, located at 1731 Marlborough Avenue was originally constructed in 1960 and expanded in 1986. A structural analysis in 2013 determined that the 1960 portion of the substation is likely to fail during a seismic event and cannot be reinforced or braced. The three northern bays in the 69kV substation bus structure must be removed and replaced along with their related equipment.

Other Alternatives: None

Responsible Office: Riverside Public Utilities / Energy Delivery Division

Priority: High

Cost Estimate: $50,000,000

Potential Funding: Capital Improvement Plan; Hazard Mitigation Grant Program

Benefits: Hunter Substation would withstand a major earthquake or other disaster and would not be severely damaged, interrupting electric service to essential emergency services and over 5,000 customers

Schedule: The Project is in the process of Request for Proposal (RFP). This is an update from February 2023.

2. Techite Pipe Replacement

Issue/Background: Replacement of segments of 27-, 36-, and 42-inch diameter Techite pipe (reinforced fiberglass pipe) which were installed in the late 1970s to early 1980s. Techite pipe is fragile and prone to rupture catastrophically when put under external stress (i.e. seismic event).

Ideas for Integration: Pipeline comprises the 'Crosstown Feeder' transmission main and based on future demand and growth projections, will need to be upsized to meet the future 80,000+ MGD demand scenario. Upsizing can be integrated with Techite replacement.

Other Alternatives: None

Responsible Office: Riverside Public Utilities / Water Engineering

Priority: High

Cost Estimate: $30,000,000

Potential Funding: Bond funding; State Revolving Funds (low interest loan); Hazard Mitigation Grant Program

Benefits: Replacement of the existing Techite Pipe will improve water system reliability by reducing the potential for catastrophic pipeline failure. Upsizing of the current pipe will provide adequate capacity to meet projected future growth demands and operational efficiencies.

Schedule: 10 years (2017-2027) Update 2.3 miles replaced and 2.4 miles remaining as 2023.

3. **Increase Water-Saving Measures Awareness**

Issue/Background: The City of Riverside has taken steps to improve our water supply and increase water conservation through education and a highly successful incentive program. Riverside Public Utility's incentives through its Green Riverside program include rebates to replace lawns with artificial turf, install Weather Based Irrigation Controllers, install high efficiency toilets and clothes washers, and through free low-flow sprinkler nozzles. The Green Riverside program participates in community events and has a strong web and social media presence to provide education and awareness regarding water conservation.

Other Alternatives: None

Responsible Office: Riverside Public Utilities – Water Conservation Coordinator

Priority: High

Cost Estimate: $5,000

Potential Funding: City Funding and Conservation Surcharge

Benefits: Through these voluntary conservation and incentive programs Riverside Public Utility customers have saved more than 782 million gallons per year. Increased awareness of these programs will increase water savings and improve the water supply for all.

Schedule: Water conservation is an on-going strategy as populations increase and water supplies fluctuate due to changing climates year-to-year.

4. **Tree Trimming Program**

Issue/Background: The City of Riverside has taken steps to mitigate losses associated with falling trees and branches through the use of its Tree Trimming program.

Other Alternatives: None

Responsible Office: Riverside Public Works – Urban Forester

Priority: High

Cost Estimate: $25,000

Potential Funding: City Funding and Measure Z

Benefits: Tree trimming will allow for less debris clean up post windstorm and floods. Consistent tree trimming makes trees healthier.

Schedule: Tree trimming is an on-going strategy.

5. **Cool Center/Warming Center Program**

Issue/Background: In partnership with Riverside County Community Action Partnership the City of Riverside participates in the Cool/Warming Center program. The City may activate a Cool Center/Warm Center to provide drop-in sites for vulnerable individuals such as seniors, disabled and others in need of temporary relief from extreme heat or winter cold.

Other Alternatives: None

Responsible Office: Riverside Parks, Recreation and Community Service, Library

Priority: High

Cost Estimate: Staff time during activation of a center.

Potential Funding: City Funding

Benefits: Provide an area of refuge to get out of the extreme heat or winter cold.

Schedule: Centers may be operated year-round either as Cooling Centers in the summer or Warming Centers in the winter.

6. **Terrorism**

Issue/Background: The Riverside Urban Area Security Initiative (UASI) provides classes and equipment to law enforcement and first responders to respond, prevent and recover from terrorism. Specialized equipment and training also assist the Fire and Police Departments with emergency and disaster response to other hazard incidents.

Other Alternatives: None

Responsible Office: Riverside Fire Department Office of Emergency Management – Urban Area Security Initiative

Priority: High

Cost Estimate: Funding from UASI fluctuates annually

Potential Funding: Homeland Security Grant Program

Benefits: Program will continuously equip, educate and train personnel on new skills and improve abilities.

Schedule: 1-5 years

7. **Increase Flood Awareness**

Issue/Background: The City of Riverside has experienced four major Disaster Declarations in the past ten years and had numerous severe storms that have led to flooding. Outreach to residents at community events such as health and safety fairs to increase awareness of the National Flood Insurance Program (NFIP) and educate residents on flood risks is extremely important.

Other Alternatives: None

Responsible Office: Riverside Fire Department Office of Emergency Management Community Preparedness Coordinator

Priority: High

Cost Estimate: City Personnel Time Only

Potential Funding: City Funding

Benefits: By encouraging Riverside residents to purchase flood insurance and increasing flood awareness and preparedness efforts, residents will lessen the impact if flooding does occur.

Schedule: 1-5 years

For additional strategies, please refer to Section 7.4 listed below and to the Riverside County Multi-Jurisdictional Hazard Mitigation Plan.

8. Seismic Improvements to the City's Drinking Water System

Issue/Background: There are two major water supply lines that transport water from the Bunker Hill Basin in San Bernardino down to the City of Riverside. These pipelines cross the San Jacinto fault and are susceptible to breakage or displacement during a severe seismic event. This project would complete a study to identify the best

alternative methods to mitigate this hazard as well as the magnitude of displacement that needs to be accounted for in the proposed mitigation alternative.

Other Alternatives: Emergency interties with neighboring agencies

Responsible Office: Riverside Public Utilities

Priority: High

Cost Estimate: $2,000,000

Potential Funding: Drinking Water State Revolving Fund; Hazard Mitigation Grant Program; Pre-Disaster Mitigation Grant; BRIC; City Funding

Benefits: Mitigating the hazard of ground displacement will reduce the potential risk of water supply loss to the City of Riverside as a result of a large-scale earthquake. Having a functional local supply of water will be key in providing resiliency to not only the City of Riverside, but the inland region as well.

Schedule: 1-5 Years

9. Riverside Transmission Reliability Project (RTRP)

Issue/Background: Currently, the only source of the City's imported energy for its customers comes through Edison's Vista Substation, located in the City of Grand Terrace. Any loss of supply at that substation would greatly affect RPU's ability to serve its customers because the Vista Substation is the only source of imported power for the City. The proposed RTRP would provide a second point of delivery for electricity, reducing dependence on the existing Vista Substation and providing the capacity and reliability needed to support recent and future growth in the area. An additional substation also provides greater flexibility for future expansion of the electrical system, as needed.

Other Alternatives: Riverside City build additional power generating stations within the city. This is not likely due to severe constraints in obtaining air quality permits for conventional natural gas fired generation and the limited capacity of renewable generation resources.

Responsible Office: Riverside Public Utilities

Priority: High

Cost Estimate: $217,000,000

Potential Funding: Joint City and Edison Funding

Benefits: The project will provide a secondary method of interconnection to the state electrical grid, offsetting potential blackouts that may threaten public safety and available power to the city.

Schedule: Ongoing, projected completion 2028

10. **Increase Wildfire Risk Awareness**

Issue/Background: The City of Riverside is always at risk of Wildland Urban Interface fires with the Santa Ana River Basin and surrounding hills that are constantly at risk of wildland fires. The outlook of a continued drought only enhances that risk. The City of Riverside website provides fire hazard risk maps to help inform the public of the risks we face. We also participate in the highly successful Ready! Set! Go! program by passing out the Ready! Set! Go! information at outreach events throughout the city and on our social media sites. With additional funds we could expand the outreach through a multi-platform media campaign through a PSA on TV, billboards near fire hazard zones and targeted mailings to residents informing them of the hazards and providing a Ready! Set! Go! detailed information on how they can mitigate wildland fire hazards on their property as well as how to be prepared if fire strikes in the Wildland Urban Interface.

Other Alternatives: None

Responsible Office: Riverside Fire Department

Priority: High

Cost Estimate: $70,000

Potential Funding: City Funding; Pre-disaster Mitigation Grant

Benefits: Increases residents' awareness of wildland fire risk and how they can mitigate their property to reduce that risk. Residents will also be better prepared if a fire does threaten their home and neighborhood.

Schedule: 1-3 years

11. Retrofit of Critical Rail and Street Infrastructure

Issue/Background: The City is trisected by two major intercontinental rail lines carrying over 130 trains per day. While the City has completed 6 rail/Highway grade

separations over the past few years to improve emergency response for the City's Police, Fire and Ambulance service, additional grade separations are needed. High on the priority list is construction of a grade separation along the BNSF Rail line to near the City's Corporation yard/Lincoln Police Station and the City's downtown and residential area to improve emergency response during any event that results in trains blocking the street crossing.

Responsible Office: Riverside Department of Public Works

Priority: High

Cost Estimate: $35 Million

Potential Funding: State and Federal Grants; Local Transportation Funds

Benefits: Provides an improved emergency response. Will reduce traffic congestion, reduction in vehicle emissions and mitigate at-grade rail incidents.

Schedule: 1-5 years

12. **Facility Back-up Power Supply**

Issue/Background: During the summer months when water is in high demand every potable water well is critical to ensure the City's water department can supply water to its customers. About 90% of the City's potable wells and all its booster pumps are powered by electrical motors. If power is shut off to any of its facilities due to a Public Safety Power Shutoff (PSPS), wildfire or high wind event the City's water department would struggle to meet demand. Dedicated back-up power supplies would ensure a higher level of service during unforeseen power outages, including support for fire-fighting efforts for first responders.

Other Alternatives: Construction of additional reservoir storage

Responsible Office: Riverside Public Utilities

Priority: High

Cost Estimate: $16,100,000

Potential Funding: Cal OES Grant; Drinking Water State Revolving Fund; Hazard Mitigation Grant Program; Pre-Disaster Mitigation Grant; City Funding

Benefits: Dedicated back-up power supplies to every critical facility would ensure the City's water department can provide water during a power outage in the hotter summer months when demand and fire danger is high.

Schedule: 1-5 years

13. Seismic Reservoir Valves

Issue/Background: Seismically actuated valves at key reservoirs are critical to ensure that a portion of the City of Riverside's water stored within the reservoir is saved for drinking water in the event of a major earthquake. In reservoirs with two cells, one cell will be isolated with a seismic valve for human health purposes, with the other cell available for firefighting.

Other Alternatives: Emergency interties with neighboring agencies

Responsible Office: Riverside Public Utilities

Priority: High

Cost Estimate: $1,000,000

Potential Funding: Drinking Water State Revolving Fund; Hazard Mitigation Grant Program; Pre-Disaster Mitigation Grant; City Funding

Benefits: Seismic valves at key reservoirs ensure a good balance of potable water being saved for the recovery effort as well as for use to fight fires. It also reduces water loss from broken pipelines. Having a functional local supply of water will be critical for the preservation of human health and life in the immediate aftermath of a major earthquake.

Schedule: In progress

14. Reservoir Seismic Retrofits

Issue/Background: In 2020, the City of Riverside retained a consultant to perform a condition assessment and seismic evaluation of two of its 1960's era reservoirs: the 2 MG Alessandro Reservoir and the 5 MG Sugarloaf Reservoir. While the reservoirs were identified to be in fair condition, they were both in need of some repairs and seismic upgrades to ensure that these structures would have the strength to withstand a future design-level seismic event.

Other Alternatives: Replacement of the existing reservoirs

Responsible Office: Riverside Public Utilities

Priority: High

Cost Estimate: $7,600,000

Potential Funding: Drinking Water State Revolving Fund; Hazard Mitigation Grant Program; Pre-Disaster Mitigation Grant; City Funding

Benefits: Seismic retrofits would ensure that the reservoirs would be able to provide an additional 15 years of service while being able to meet current code requirements and resisting design-level earthquakes. Having functional water storage will be critical for the preservation of human health and life in the immediate aftermath of a major earthquake.

Schedule: 1-5 years

For additional strategies that may influence the City of Riverside, please refer to the Riverside County Multi-Jurisdictional Hazard Mitigation Plan.

15. Facility Back-up Power Supply

Issue/Background: During the summer months and extreme wind events there is risk to power supply. If a Public Safety Power Shutoff (PSPS), wildfire or high wind event the City's the City's Corporation Yard could be affected. A dedicated Micro-Grid would ensure a higher level of service during unforeseen power outages, including support for emergency efforts at the Utility Operations Center, Emergency Operations Center and Corp Yard operations.

Other Alternatives: Emergency Generator Power

Responsible Office: Riverside Public Utilities

Priority: High

Potential Funding: Cal OES Grant; Hazard Mitigation Grant Program; Pre-Disaster Mitigation Grant; DOE Resiliency Grants; City Funding

Benefits: Dedicated back-up power supplies for critical facilities that coordinate emergency operations and grid operations would ensure continued operations during a power outage in the hotter summer months when demand and fire danger is high.

Schedule: 1-5 years

SECTION 8.0 - PLAN IMPLEMENTATION AND MAINTENANCE PROCESS

8.1 MONITORING, EVALUATING AND UPDATING PLAN

The LHMP is a living document that reflects the City's ongoing hazard mitigation activities. The process of monitoring, evaluating, and updating the Plan will be critical to the effectiveness of hazard mitigation. The Emergency Services Coordinator with the City's Office of Emergency Management is responsible for maintaining, evaluating, and updating the Plan. The Plan will be reviewed annually and updated every five years as required. The plan is also reviewed as part of the normal review and update of the City's General Plan and Safety Element. The Safety Element planning and updates occurred in 2021. Recommendation for Plan revisions will be based on the following criteria:

- Changes in federal or state laws
- Accomplishment of Actions, Objectives and Goals
- Advances in knowledge or understanding of hazards.
- Additional hazard events, including federally declared disasters.
- Changes in the City's risk to the identified and/or additional hazards
- Performance of mitigation projects during hazard events.

The Local Hazard Mitigation Planning Team (HMPT) will convene annually to review the progress made towards the Plan's goals and objectives. The HMPT will review each goal and objective to determine their relevance to changing situations in the City, as well as changes in state or federal policy and laws to ensure that the Plan is addressing current and expected conditions. The HMPT will also review the risk assessment section of the Plan to determine if this information should be updated or modified. The parties responsible for the various implementation actions will report on the status of their projects and will include which implementation processes worked well, any difficulties encountered, how coordination efforts were proceeding, and which strategies should be revised.

SECTION 9.0 - INCORPORATION INTO EXISTING PLANNING MECHANISMS

9.1 HAZARD MITIGATION PLAN INCORPORATION

The 2018 Local Hazard Mitigation Plan and related strategies have been incorporated into the following City of Riverside Plans. During the planning process for new and updated local planning documents, the LHMP has been used to ensure consistency with the hazard mitigation goals and strategies across the plans. (See Section 6.6)

1. CITY OF RIVERSIDE GENERAL PLAN

The City's General Plan provides objectives and policies that guide land use and development decisions as well as help shape the priorities of the city.

Name: Riverside General Plan 2025

Last Update: Element Amended October 2021

Next Update: Plan, Elements and Implementation Plan are reviewed annually

Major portions of the plan include:

- Land Use and Urban Design Element – Amended March 2013
- Circulation and Community Mobility Element – Amended November 2012
- Housing Element – Amended October 2021
- Arts and Culture Element – Adopted November 2007
- Education Element – Adopted November 2007
- Public Safety Element – Amended October 2021
    - Policy PS-1 Natural Hazards: Reduce the risk to the community from hazards related to geologic conditions, seismic activity, flooding, drought, and wildland fires
    - Policy PS-2 – Hazardous Materials: Minimize the risk of potential hazards associated with management and transport of hazardous materials
    - Policy PS-3 – Transportation: Minimize the risk of potential hazards associated with air and ground transportation
    - Policy PS-5 – Pandemic: Provide responsive public health services to all residents of Riverside
    - Policy PS 7 – Climate Adaptation and Resiliency: Identify key potential impacts of climate change on city organizations, infrastructure, natural resources, and residents and develop adaptation pathways and resiliency pathways to address them
- Noise Element – Adopted November 2007

- Open Space and Conservation Element – Amended November 2012
- Air Quality Element – Adopted November 2007
- Public Facilities & Infrastructure Element – Amended November 2012
- Park and Recreation Element – Amended November 2012
- Historic Preservation Element – Amended November 2012

  Adopted: November 2007

2. BUILDING AND SAFETY – Adopted November 22, 2022

   Name: California Building Standards Code

   Used to enforce safe structural standards and to reduce damages from earthquakes and other building hazards.

3. FIRE CODE – Adopted October 18, 2022

   Name: 2022 California Fire Code

   The Fire Code seeks to safeguard of life and property from the hazards of fire and explosion arising from the storage, handling and use of hazardous substances, materials and devices and from conditions hazardous to life or property in the use or occupancy of buildings or premises.

4. RIVERSIDE MUNICIPAL CODE 6.15.020 – Adopted March 12, 2019

   The Riverside Municipal Code reduces risk to property from wildland fire through the enforcement of weed abatement inspections and fines.

5. CAPITAL IMPROVEMENT PLAN

   The City's Capital Improvement Program (CIP) is a multi-year (updated yearly) planning instrument that drives the evaluation and identification of capital infrastructure projects in need of renovation, repair and/or construction.

   https://riversideca.gov/finance/budget.asp

   Name: Capital Improvement Program FY 2022-2027

   Last Update: June 21, 2022

6. EMERGENCY OPERATIONS PLAN

   The Emergency Operations Plan (EOP) provides strategic guidance for response and recovery to a full range of emergencies and disasters. The EOP is both a preparedness and response document.

   Name: City of Riverside Emergency Operations Plan, Part I: Base Plan

   Adopted: January 18, 2011, by Resolution No. 22151

   Last Update: Under Full Revision for promulgation in 2023

7. HAZARDOUS MATERIALS AREA PLAN

   The Area Plan was developed to be used in conjunction with the EOP and LHMP. It helps prepare and respond to hazardous materials incidents.

   Last Updated: April 13, 2021

   Next Update: June 13, 2024

9.2 HAZARD MITIGATION PLAN IMPLEMENTATION

Through adoption of the City's General Plan and zoning ordinances, the City of Riverside plans to integrate the 2023 Local Hazard Mitigation Plan upon adoption. Other plans and programs to be coordinated with the recommendation of the hazard mitigation plan include the following:

- The City of Riverside General Plan
- The Emergency Operations Plan
- Hazardous Materials Plan
- Riverside Municipal Code 6.15.020

SECTION 10.0 - CONTINUED PUBLIC INVOLVEMENT

The City of Riverside is dedicated to involving the public directly in the continual reshaping and updating of the Hazard Mitigation Plan. The HMPT members will be responsible for the annual review and update of the Plan. The five-year update will incorporate at least one public comment period to allow public involvement, input, and feedback about the Plan.

APPENDIX A – PUBLIC NOTICES AND MAPS

City Council Agenda – January 10, 2023

CITY OF RIVERSIDE

City of Arts & Innovation

City of Riverside

City Council

Successor Agency

Agenda

Mayor
Patricia Lock Dawson

Councilmembers:

Erin Edwards
Clarissa Cervantes
Ronaldo Fierro
Chuck Conder
Gaby Plascencia
Jim Perry
Steve Hemenway

Meeting Date: Tuesday, January 10, 2023 **3:00 PM**
Publication Date: Thursday, December 29, 2022

City Hall - Art Pick Council Chamber
3900 Main Street, Riverside
View Virtual Meeting at
www.RiversideCA.gov/Meeting or
www.WatchRiverside.com

COMMUNICATIONS

6 Intergovernmental relations and legislative update (City Manager) (All Wards) (5-minute presentation)

7 Homeless solutions update (City Manager) (All Wards) (5-minute presentation)

8 Sustainability update (City Manager) (All Wards) (5-minute presentation)

9 Pertinent health, safety, and security updates (City Manager) (All Wards) (5-minute presentation)

10 Legal update (City Attorney) (All Wards) (5-minute presentation)

11 Declaration of conflicts of interest on any agenda items (City Council)

RESPONSE RECOVERY THRIVE

Health and Safety Update

CITY OF RIVERSIDE OEM Office of Emergency Management

January 10, 2023

CITY OF RIVERSIDE EST. 1887 Service Honor Courage FIRE

1

RIVERSIDE

RiversideCA.gov

Local Hazard Mitigation Plan Annex Update

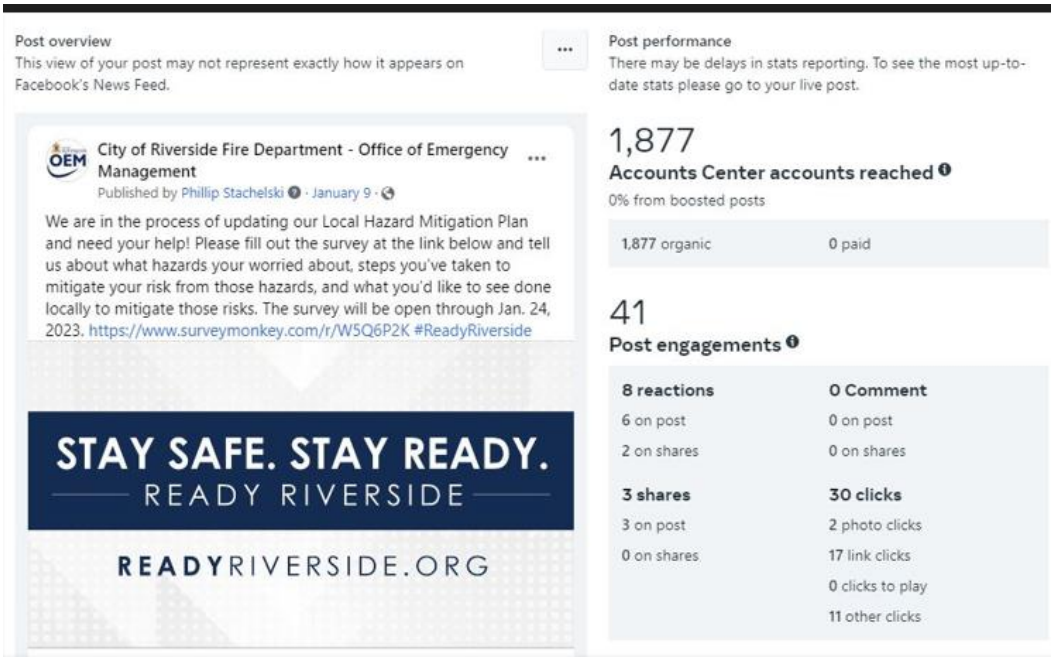
- Partnering with County on an Operational Area Hazard Mitigation Plan
- Updating City Annex
- Survey out seeking input from public
- https://www.surveymonkey.com/r/RiversideLHMP

4

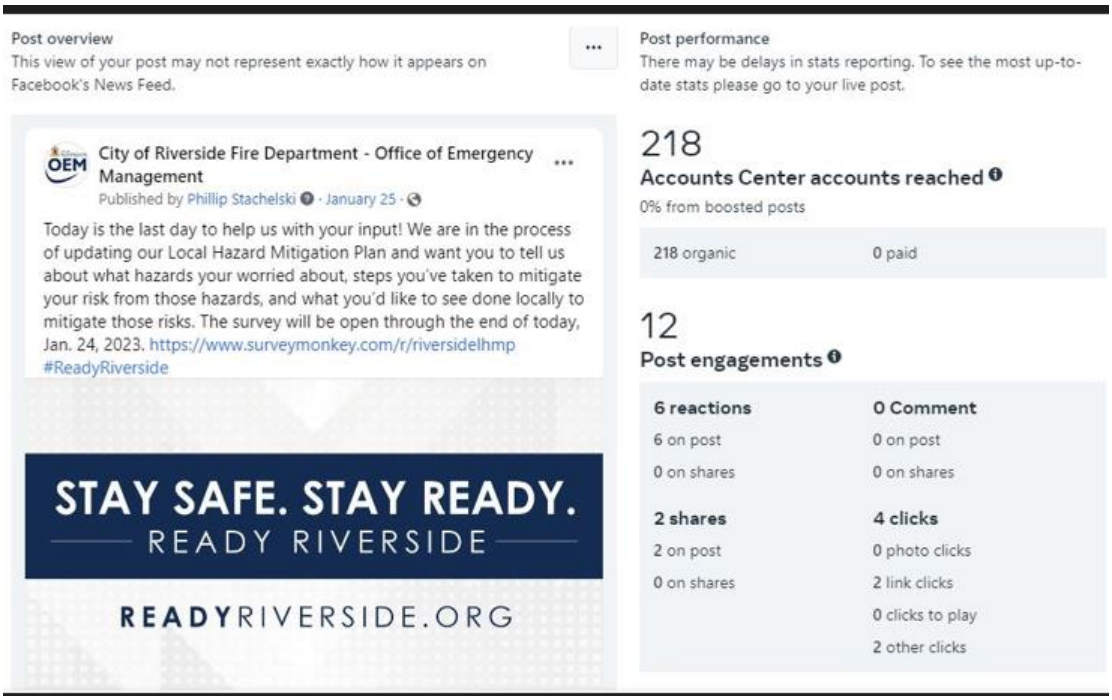
RIVERSIDE

RiversideCA.gov

Social Media Posts Regarding Public Comment




Riverside OEM
@RiversideOEM
Today is the last day to help us with your input! We are in the process of updating our Local Hazard Mitigation Plan and want your thoughts. The survey will be open through the end of today, Jan. 24, 2023.
surveymonkey.com/r/riversidelhmp #ReadyRiverside
8:52 AM · Jan 25, 2023 · 346 Views


Post overview
This view of your post may not represent exactly how it appears on Facebook's News Feed.
City of Riverside Fire Department - Office of Emergency Management
Published by Phillip Stachelski · January 25 ·
Today is the last day to help us with your input! We are in the process of updating our Local Hazard Mitigation Plan and want you to tell us about what hazards your worried about, steps you've taken to mitigate your risk from those hazards, and what you'd like to see done locally to mitigate those risks. The survey will be open through the end of today, Jan. 24, 2023. https://www.surveymonkey.com/r/riversidelhmp #ReadyRiverside
STAY SAFE. STAY READY.
READY RIVERSIDE
READYRIVERSIDE.ORG
Post performance
There may be delays in stats reporting. To see the most up-to-date stats please go to your live post.
218
Accounts Center accounts reached
0% from boosted posts
218 organic
0 paid
12
Post engagements
6 reactions
6 on post
0 on shares
0 Comment
0 on post
0 on shares
2 shares
2 on post
0 on shares
4 clicks
0 photo clicks
2 link clicks
0 clicks to play
2 other clicks

CERT Newsletter – January 2023

Local Hazard Mitigation Plan

Update Survey

The City of Riverside Office of Emergency Management is in the process of updating our Local Hazard Mitigation Plan and need your help! Please fill out the survey at the link below and tell us about what hazards your worried about, steps you've taken to mitigate your risk from those hazards, and what you'd like to see done locally to mitigate those risks.

As a member of our CERT Program, you have a special awareness to the hazards and needs in our community, and your participation would be a huge help to our update process. The survey will be open through January 24, 2023

https://www.surveymonkey.com/r/W5Q6P2K

APPENDIX B – INVENTORY WORKSHEETS

RIVERSIDE
LOCAL HAZARD MITIGATION PLAN
2023 INVENTORY WORKSHEETS

CITY OF RIVERSIDE
February 22, 2023

TABLE OF CONTENTS

1. LOCAL JURISDICTION CONTACT INFORMATION

The information on this page identifies:

- Jurisdiction and the contact person
- Jurisdiction's service area size and population
- EOP Plan and a Safety Element of their General Plan

PLEASE PROVIDE THE FOLLOWING INFORMATION:

Agency/Jurisdiction:		CITY OF RIVERSIDE		
Type Agency/Jurisdiction:		CITY		
Contact Person:	Title:	EMERGENCY SERVICES ADMINISTRATOR		
First Name:	MARK	Last Name:	ANNAS	
Agency Address:	Street:	3085 ST LAWRENCE ST		
	City:	RIVERSIDE		
	State:	CA		
	Zip:	92504		
Contact Phone	951-320-8100		FAX	
E-mail				

Population Served	317,261	Square Miles Served	81

Does your organization have a general plan?	YES
Does your organization have a safety component to the general plan?	YES
What year was your plan last updated?	2021

Does your organization have a disaster/emergency operations plan?	YES
What year was your plan last updated?	2019
Do you have a recovery annex or section in your plan?	YES
Do you have a terrorism/WMD annex or section in your plan?	YES

2. Hazard Identification Questionnaire Overview

The purpose of the questionnaire is to help identify the hazards within your jurisdiction's service area. The list was developed from the first round of meetings with the various working groups during the 2012 Multi-Jurisdictional Local Hazard Mitigation Plan (MJLHMP) development. Each hazard identified in the Operational Area is discussed in detail in the 2018 MJLHMP. The information identified in this questionnaire will be used as the basis for each jurisdiction to evaluate its capabilities, determine its needs, and to assist in developing goals and strategies.

The information will help identify:

a) What hazards are within or adjacent to the jurisdiction's service area?

b) Which of those hazards have had reoccurring events?

c) What specific hazards and risks are considered by the jurisdiction to be a threat specifically to the jurisdiction? [These locations should be identified by name and location for inclusion in the Specific Hazard Summary (Table 1B)]

1. Specific types of facilities owned and operated by the jurisdiction and potential impact should be considered

2. Locations of damage from prior disasters or hazard causing events should be considered

d) Information about the jurisdiction's EOC

Instructions: With your Multi-Disciplinary Planning Team, you should take the following steps:

a) Instructions for updating jurisdictions: Review your old questionnaire for accuracy and relevance, mark changes.

b) Instructions for new jurisdictions: meet and go over the questionnaire. Fill in YES, NO or NA on the questionnaire.

HAZARD IDENTIFICATION QUESTIONNAIRE (Table 1A)

DOES YOUR ORGANIZATION HAVE:	
AIRPORT IN JURISDICTION	YES
AIRPORT NEXT TO JURISDICTION	YES
DAIRY INDUSTRY	NO
POULTRY INDUSTRY	NO
CROPS/ORCHARDS	YES
DAMS IN JURISDICTION	YES
DAMS NEXT TO JURISDICTION	YES
LAKE/RESERVOIR IN JURISDICTION	YES
LAKE/RESERVOIR NEAR JURISDICTION	YES
JURISDICTION IN FLOOD PLAIN	YES
CONTROLLED FLOOD CONTROL CHANNEL	YES
UNCONTROLLED FLOOD CONTROL CHANNEL	YES
EARTHQUAKE FAULTS IN JURISDICTION	NO
EARTHQUAKE FAULTS NEXT TO JURISDICTION	YES
MOBILE HOME PARKS	YES
NON-REINFORCED FREEWAY BRIDGES	NO
NON-REINFORCED BRIDGES	YES
BRIDGES IN FLOOD PLAIN	YES
BRIDGES OVER OR ACROSS RIVER/STREAM	YES
ROADWAY CROSSING RIVER/STREAM	YES
NON-REINFORCED BUILDINGS	YES
FREEWAY/MAJOR HIGHWAY IN JURISDICTION	YES
FREEWAY/MAJOR HIGHWAY NEXT TO JURISDICTION	YES
FOREST AREA IN JURISDICTION	NO
FOREST AREA NEXT TO JURISDICTION	NO
WITHIN THE 50 MILES SAN ONOFRE EVACUATION ZONE	YES
MAJOR GAS/OIL PIPELINES IN JURISDICTION	YES
MAJOR GAS/OIL PIPELINES NEXT TO JURISDICTION	YES
RAILROAD TRACKS IN JURISDICTION	YES
RAILROAD TRACKS NEXT TO JURISDICTION	YES
HAZARDOUS WASTE FACILITIES IN JURISDICTION	YES
HAZARDOUS WASTE FACILITIES NEXT TO JURISDICTION	YES
HAZARDOUS STORAGE FACILITIES IN JURISDICTION	YES
HAZARDOUS STORAGE FACILITIES NEXT TO JURISDICTION	YES
DOES YOUR ORGANIZATION OWN OR OPERATE A FACILITY	
IN A FLOOD PLAIN	YES
NEAR FLOOD PLAIN	YES
NEAR RAILROAD TRACKS	YES
NEAR A DAM	YES
UPSTREAM FROM A DAM	YES
DOWNSTREAM FROM A DAM	YES
DOWNSTREAM OF A LAKE	YES
DOWNSTREAM FROM A RESERVOIR	YES
NEAR A CONTROLLED FLOOD CONTROL CHANNEL	YES
NEAR UNCONTROLLED FLOOD CONTROL CHANNEL	YES
ON AN EARTHQUAKE FAULT	NO
NEAR AN EARTHQUAKE FAULT	NO
WITHIN THE 50 MILE SAN ONOFRE EVACUATION ZONE	YES

HAZARD IDENTIFICATION QUESTIONAIRE CONTINUED (Table 1A)

DOES YOUR ORGANIZATION OWN OR OPERATE A FACILITY CONTINUED:	
IN A FOREST AREA	NO
NEAR A FOREST AREA	NO
NEAR A MAJOR HIGHWAY	YES
A HAZARDOUS WASTE FACILITY	YES
NEAR A HAZARDOUS WASTE FACILITY	NO
A HAZARDOUS STORAGE FACILITY	YES
NEAR A HAZARDOUS STORAGE FACILITY	YES
NON-REINFORCED BUILDINGS	YES
A MAJOR GAS/OIL PIPELINE	NO
NEAR A MAJOR GAS/OIL PIPELINE	YES
DOES YOUR ORGANIZATION HAVE ANY LOCATIONS THAT:	
HAVE BEEN DAMAGED BY EARTHQUAKE AND NOT REPAIRED	NO
HAVE BEEN DAMAGED BY FLOOD	YES
HAVE BEEN DAMAGED BY FLOOD MORE THAN ONCE	YES
HAVE BEEN DAMAGED BY FOREST FIRE	NO
HAVE BEEN DAMAGED BY FOREST FIRE MORE THAN ONCE	NO
HAVE BEEN DAMAGED BY WILDLAND FIRE	
HAVE BEEN DAMAGED BY WILDLAND FIRE MORE THAN ONCE	
HAVE BEEN IMPACTED BY A TRANSPORTATION ACCIDENT	NO
HAVE BEEN IMPACTED BY A PIPELINE EVENT	YES
EMERGENCY OPERATIONS INFORMATION	
DOES YOUR ORGANIZATION HAVE AN EOC	YES
IS YOUR EOC LOCATED IN A FLOOD PLAIN	NO
NEAR FLOOD PLAIN	YES
NEAR RAILROAD TRACKS	YES
NEAR A DAM	NO
UPSTREAM FROM A DAM	NO
DOWNSTREAM FROM A DAM	NO
DOWNSTREAM OF A LAKE	NO
DOWNSTREAM FROM A RESERVOIR	NO
NEAR A CONTROLLED FLOOD CONTROL CHANNEL	NO
NEAR UNCONTROLLED FLOOD CONTROL CHANNEL	NO
ON AN EARTHQUAKE FAULT	NO
NEAR AN EARTHQUAKE FAULT	YES
WITHIN THE 50 MILE SAN ONOFRE EVACUATION ZONE	YES
IN A FOREST AREA	NO
NEAR A FOREST AREA	NO
NEAR A MAJOR HIGHWAY	YES
A HAZARDOUS WASTE FACILITY	NO
NEAR A HAZARDOUS WASTE FACILITY	NO
A HAZARDOUS STORAGE FACILITY	NO
NEAR A HAZARDOUS STORAGE FACILITY	YES
NON-REINFORCED BUILDINGS	NO
A MAJOR GAS/OIL PIPELINE	NO
NEAR A MAJOR GAS/OIL PIPELINE	NO
OTHER FACILITY INFORMATION **ARE THERE LOCATIONS WITHIN YOUR JURISDICTION THAT:**	
COULD BE CONSIDERED A TERRORIST TARGET	YES
COULD BE CONSIDERED A BIO-HAZARD RISK	YES

With your planning team, list the “Yes” answers and discuss. Use the information as a group to summarize your jurisdiction’s hazards and vulnerabilities.

3. SPECIFIC HAZARDS SUMMARY

This table helps to identify the information (name, owner, location, etc.) about the specific hazards identified in the Hazard Questionnaire.

In the Summary Table, list the basic information of the hazards identified by the jurisdiction in the Hazard Identification Questionnaire as a potential threat. These specific hazards were used in the development of response plans, maps, and other analysis data.

a. Instructions for Updating Jurisdictions and Special Districts: With your planning team, review the “Yes” answers and see if there were any changes, if so summarize why there is a difference from the 2012.

b. Instructions for New Jurisdictions and Special Districts: With your planning team, review the “Yes” answers and discuss. Use the information as a group to summarize your jurisdiction’s hazards and vulnerabilities.

SPECIFIC HAZARDS SUMMARY (TABLE 1B)

Jurisdiction	Hazard Type	Hazard Name	In Jurisdiction?	Adjacent to Jurisdiction?

4. JURISDICTION VULNERABILITY WORKSHEET

The Jurisdiction Vulnerability Worksheet (Ref. Table 1C) is a listing of the primary hazards identified within the Riverside County 2018 MJLHMP. Each jurisdiction is asked to evaluate the impact of a potential event to occur in their jurisdiction for each primary hazard.

The bases of potential impacts from each hazard are to be determined on:

1. Economic conditions
2. Property, facilities, and infrastructure
3. Continuity of operations including continued delivery of services
4. Ability to quickly recover from the event and return to normal daily activities

5. Public; loss of life and potential injuries from the event
6. Responders' ability to respond and provide services
7. Environmental conditions
8. Public confidence in the jurisdiction's governance

INSTRUCTIONS: Jurisdictions are asked to rate the potential and severity for each hazard using a scale of between 0 and 4 (4 being the most severe). The jurisdictions are also asked to rank the listed hazards as they relate to their jurisdiction from 1 to 24 (1 being the highest overall threat to their jurisdiction).

a. Instructions for updating jurisdictions: Review the table from the previous update and determine if your jurisdiction's ranking from the current LHMP remains the same.

b. Instructions for new jurisdictions: Please evaluate the potential for an event to occur in your jurisdiction by hazard. Then, evaluate the potential impact of that event by hazard on your jurisdiction according to potential impacts #1-8 listed above.

.

NAME:	AGENCY:	DATE :

	LOCAL JURISDICTION		
HAZARD	**SEVERITY 0 - 4**	**PROBABILITY 0 - 4**	**RANKING 1 - 25**
1. EARTHQUAKE			
2. WILDLAND FIRE			
3. FLOOD			
OTHER NATURAL HAZARDS			
4. DROUGHT			
5. LANDSLIDES			
6. INSECT INFESTATION			
7. EXTREME SUMMER/WINTER WEATHER			
8. SEVERE WIND EVENT			
9. Tornado			
AGRICULTURAL			
10. TERRORISM			
OTHER HUMAN CAUSED			
11. GAS/FUEL PIPELINE			
12. AQUEDUCT/CANAL			
13. TRANSPORTATION			
14. POWER OUTAGE			
15. HAZMAT ACCIDENTS			
16. NUCLEAR ACCIDENT			
17. TERRORISM			
18. CIVIL UNREST			
19. JAIL/PRISON EVENT			
20. WATER SYSTEM			
21. SEWER SYSTEM			
22. DAM FAILURE/INUNDATION			
23. COMMUNICATIONS OUTAGE			
24. CYBER SECURITY			
MEDICAL			
25. PANDEMIC/DISEASE/CONTAMINATION			

5. JURISDICTION MITIGATION STRATEGIES AND GOALS

This table is a listing of the various mitigation strategies, goals, and objectives developed for the 2012 MJLHMP plan development and the 2018 MJLHMP update. Participating jurisdictions are given the opportunity to list additional strategies, goals, and objectives specific to their jurisdiction.

Instructions: Jurisdictions are asked to take the following steps with their planning team:

a. Instructions for Updating Jurisdictions: Review the table (Ref. Table 1D); determine if your ranking from the 2018 MJLHMP remains the same and update the table accordingly.

b. Instructions for New Jurisdictions: please follow steps below.

Evaluate the priority level for each listed mitigation goal identified below as it relates to your jurisdiction or facility. If you have any additional mitigation goals or recommendations, please list them at the end of this document.

Place an H (High), M (Medium), L (Low), or N/A (Not Applicable) for your priority level for each mitigation goal in the box next to the activity.

Place an H (High), M (Medium), L (Low), or N/A (Not Applicable) for your priority level for each mitigation goal in the box next to the activity.

JURISDICTION MITIGATION STRATEGIES AND GOALS (TABLE 1D)

EARTHQUAKE	
H	Aggressive public education campaign in-light of predictions
H	Generate new literature for dissemination to:
H	◊ Government employees
H	◊ Businesses
H	◊ Hotel/motel literature
H	◊ Local radio stations for education
H	◊ Public education via utilities
H	◊ Identify/create television documentary content
H	Improve the Emergency Alert System (EAS)
H	◊ Consider integration with radio notification systems
H	◊ Upgrade alerting and warning systems for hearing impaired

H	◊ Training and maintenance
M	Procure earthquake-warning devices for critical facilities
M	Reinforce emergency response facilities
M	Provide training to hospital staffs
M	Require earthquake gas shutoffs on remodels/new construction
M	Evaluate re-enforcing reservoir concrete bases
L	Evaluate EOCs for seismic stability
EARTHQUAKE CONTINUED	
L	Install earthquake cutoffs at reservoirs
L	Install earthquake-warning devices at critical facilities
NA	Develop a dam inundation plan for new Diamond Valley Reservoir
	Earthquake retrofitting:
H	◊ Bridges/dams/pipelines
H	◊ Government buildings/schools
H	◊ Mobile home parks
H	Develop educational materials on structural reinforcement and home inspections
	Ensure Uniform Building Code compliance
H	◊ Update to current compliance when retrofitting
M	Insurance coverage on public facilities
L	Funding for non-structural abatement (Earthquake kits, etc.)
NA	Pre - identify empty commercial space for seismic re-location
H	Electrical co-generation facilities need retrofitting/reinforcement (Palm Springs, others?)
M	Mapping of liquefaction zones
M	Incorporate County geologist data into planning
H	Backup water supplies for hospitals
M	Evaluate pipeline seismic resiliency
L	Pre-positioning of temporary response structures
H	Fire sprinkler ordinance for all structures
L	Evaluate adequacy of reservoir capacity for sprinkler systems
M	Training/standardization for contractors performing retrofitting
	Website with mitigation/contractor/retrofitting information
M	◇ Links to Jurisdictions
M	◇ Alerting Information
M	◇ Volunteer Information
M	Evaluate depths of aquifers/wells for adequacy during quakes
M	Evaluate hazmat storage regulations near faults
	Funding for non-structural abatement (Earthquake kits, etc.)
	Pre - identify empty commercial space for seismic re-location
	Electrical co-generation facilities need retrofitting/reinforcement (Palm Springs, others?)
	Mapping of liquefaction zones
	Incorporate County geologist data into planning

	Backup water supplies for hospitals
COMMUNICATIONS IN DISASTER ISSUES	
H	Communications Interoperability
H	Harden repeater sites
H	Continue existing interoperability project
H	Strengthen/harden
COMMUNICATIONS IN DISASTER ISSUES CONTINUED	
H	Relocate
H	Redundancy
H	Mobile repeaters
FLOODS	
M	Update development policies for flood plains
M	Public education on locations of flood plains
M	Develop multi-jurisdictional working group on floodplain management
M	Develop greenbelt requirements in new developments
M	Update weather pattern/flood plain maps
H	Conduct countywide study of flood barriers/channels/gates/water dispersal systems
M	Required water flow/runoff plans for new development
H	Perform GIS mapping of flood channels, etc.
L	Install vehicular crossing gates/physical barriers for road closure
H	Maintenance of storm sewers/flood channels
H	Create map of flood channels/diversions/water systems etc.
L	Require digital floor plans on new non-residential construction
H	Upgrade dirt embankments to concrete
L	Conduct countywide needs study on drainage capabilities
L	Increase number of pumping stations
H	Increase sandbag distribution capacities
	Develop pre-planned response plan for floods
M	◊ Evacuation documentation
M	◊ Re-examine historical flooding data for potential street re-design
H	Training for city/county PIOs about flood issues
	Warning systems - ensure accurate information provided
M	◊ Publicize flood plain information (website?)
L	◊ Install warning/water level signage
M	◊ Enhanced public information
H	◊ Road closure compliance
H	◊ Shelter locations
H	◊ Pre-event communications
	Look at County requirements for neighborhood access
M	◊ Secondary means of ingress/egress
M	Vegetation restoration programs

M	Ensure critical facilities are hardened/backed up
H	Hardening water towers
H	Terrorism Surveillance - cameras at reservoirs/dams
H	Riverbed maintenance
H	Evaluate existing lift stations for adequacy
	FLOODS CONTINUED
M	Acquisition of property for on-site retention
M	Evaluate regulations on roof drainage mechanism
M	Erosion-resistant plants
M	Traffic light protection
M	Upkeep of diversionary devices
M	Install more turn-off valves on pipelines
H	Backup generation facilities
H	Identify swift water rescue capabilities across County
	Upkeep of diversionary devices
	Install more turn-off valves on pipelines
	Backup generation facilities
	Identify swift water rescue capabilities across County
	WILDFIRES
H	Aggressive weed abatement program
H	◊ Networking of agencies for weed abatement
NA	Develop strategic plan for forest management
H	Public education on wildfire defense
H	Encourage citizen surveillance and reporting
H	Identify hydrants with equipment ownership information
H	Enhanced firefighting equipment
H	Fire spotter program/red flag program
H	◊ Expand to other utilities
M	Research on insect/pest mitigation technologies
M	Volunteer home inspection program
	Public education program
H	◊ Weather reporting/alerting
H	◊ Building protection
H	◊ Respiration
H	Pre-identify shelters/recovery centers/other resources
H	Roofing materials/defensive spacing regulations
M	Community task forces for planning and education
M	Fuel/dead tree removal
H	Strategic pre-placement of firefighting equipment
H	Establish FEMA coordination processes based on ICS
H	Brush clearings around repeaters

H	Research new technologies for identifying/tracking fires
H	Provide fire-resistant gel to homeowners
H	Involve insurance agencies in mitigation programs
M	Clear out abandoned vehicles from oases
WILDFIRES CONTINUED	
H	Code enforcement
M	Codes prohibiting fireworks
M	Fuel modification/removal
M	Evaluate building codes
M	Maintaining catch basins
OTHER HAZARDS	
M	Improve pipeline maintenance
M	Wetlands, mosquito mitigation (West Nile Virus)
M	Insect control study
M	Increase County Vector Control capacities
H	General public drought awareness
H	◇ Lawn watering rotation
M	Develop County drought plan
NA	Mitigation of landslide-prone areas
NA	Develop winter storm sheltering plan
L	Ease permitting process for building transmission lines
L	Evaluate restrictions on dust/dirt/generating activities during wind seasons
NA	Rotational crop planning/soil stabilization
NA	Enhance agricultural checkpoint enforcement
M	Agriculture - funding of detection programs
M	Communications of pipeline maps (based on need to know)
M	Improved notification plan on runaway trains
H	Improve/maintain blackout notification plan.
H	Support business continuity planning for utility outages
H	Terrorism training/equipment for first responders
H	◇ Terrorism planning/coordination
H	◇ Staffing for terrorism mitigation
H	◇ Include dirty bomb planning
H	Cooling stations - MOUs in place
L	Fire Ant eradication program
L	White Fly infestation abatement/eradication program
H	Develop plan for supplemental water sources
H	Public education on low water landscaping
NA	Salton Sea desalinization
M	Establish agriculture security standards (focus on water supply)
M	ID mutual aid agreements

H	Vulnerability assessment on fiber-optic cable
M	Upgrade valves on California aqueduct
	Public education
OTHER HAZARDS CONTINUED	
	Cooling stations - MOUs in place
	Fire Ant eradication program
	White Fly infestation abatement/eradication program
	Develop plan for supplemental water sources
	Public education on low water landscaping
M	◇ Bi-lingual signs
H	◇ Power Outage information
M	Notification system for rail traffic - container contents
H	Control and release of terrorism intelligence
NA	Develop prison evacuation plan (shelter in place?)

LOCAL JURISDICTION MITIGATION STREGIES AND GOALS CONTINUED

Use the list and rankings identified (Table 1C & Table 1D) to narrow down or identify "your" prioritized strategies. The mitigation strategy serves as the long-term blueprint for reducing the potential losses identified in the risk assessment. The mitigation strategy includes the development of goals, objectives, and prioritized mitigation actions.

Goals are general guidelines that explain what you want to achieve. They are broad policy statements and are usually long-term and represent global visions, such as "Protect existing property."

Objectives define strategies or implementation steps to attain the identified goals. Unlike goals, objectives are specific, measurable, and may have a defined completion date. Objectives are more specific, such as "Increase the number of buildings protected from flooding."

The development of effective goals and objectives enables the planning team to evaluate the merits of alternative mitigation actions and the local conditions in which these activities would be pursued.

In the 2018 MJLHMP, each jurisdiction was required to develop a Mitigation Strategy Proposal based on one of the following:

a) The strategy, goal, or objective rating "High Priority" on the Local Jurisdiction Mitigation Strategies and Goals
b) A specifically identified strategy, goal, or objective that was developed as part

of one of the working groups planning sessions such as the hospitals or agriculture

c) A specifically identified strategy, goal, or objective that was developed as part of one of the jurisdiction's internal working group planning sessions

6. LOCAL JURISDICTION PROPOSED MITIGATION ACTION AND STRATEGY PROPOSAL

Instructions: Jurisdictions are asked to take the following steps with their planning team:

a. Instructions for updating jurisdictions: review the local jurisdiction mitigation strategies and goals table (Ref. Table 1D) and determine if your jurisdiction's ranking from the 2018 LHMP remains the same.

Review the chosen mitigation strategy that your jurisdiction submitted. The updated plan must identify the completed, deleted, or deferred actions or activities from the previously approved plan as a benchmark for progress.

If the mitigation actions or activities remain unchanged from the previously approved plan, the updated plan must indicate why changes are not necessary. Further, the updated plan shall include in its prioritization any new mitigation actions identified since the previous plan was approved or through the plan update process.

b. Instructions for new jurisdictions: use the "High Priority" rated strategy, goal or objective as a starting point to determine your mitigation strategy proposal.

7. LOCAL JURISDICTION DEVELOPMENT TRENDS QUESTIONNAIRE

LAND USE ISSUES - COMPLETE THE INFORMATION BELOW

This questionnaire identifies a comparison of specific land use issues from 2018, 2023 and 2028. The questionnaire also identifies the specific threat potential to the jurisdiction in relationship to residential and commercial structures along with critical facilities. This threat potential is focused on structural loss rather than dollar loss as it relates to the three main natural hazards – earthquakes, floods, and wildland fires. The determination of dollar loss relating to commercial and critical facilities was found to be very limited and a difficult to establish.

The questionnaire also requires the jurisdiction to identify the process it will use to maintain their portion of the Plan.

LOCAL JURISDICTION DEVELOPMENT TRENDS QUESTIONNAIRE 2023 (Table 1F)

JURISDICTION:	DOES YOUR AGENCY HAVE RESPONSIBILITY FOR LAND USE AND/OR DEVELOPMENT ISSUES WITHIN YOUR JURISDICTIONAL BOUNDARIES? YES NO			
	2018 DATA	2023 DATA		2028
Current Population in Jurisdiction or Served	326,792	317,261	Projected Population in Jurisdiction or Served - in 2028	
Current Sq Miles in Jurisdiction or Served	81	81	Projected Sq Miles in Jurisdiction or Served - in 2028	
Does Your Jurisdiction have any ordinances or regulations dealing with disaster mitigation, disaster preparation, or disaster response?	Yes	Yes	If yes, please list ordinance or regulation number. RMC 9.20	
What is the number one land issue your agency will face in the next five years				
Approximate Number of Homes/Apts/etc.			Projected Number of Homes/Apts/etc.- in 2028	
Approximate Total Residential Value			Projected Residential Total Value - in 2028	
Approximate Number of Commercial Businesses			Projected Number of Commercial Businesses - in 2028	
Approximate Percentage of Homes/Apts/etc in flood hazard zones	35	35	Approximate Percentage of Homes/Apts/etc in flood hazard zones - in 2028	
Approximate Percentage of Homes/Apts/etc in earthquake hazard zones	100	100	Approximate Percentage of Homes/Apts/etc in earthquake hazard zones - in 2028	
Approximate Percentage of Homes/Apts/etc in wildland fire hazard zones	10	10	Approximate Percentage of Homes/Apts/etc in wildland fire hazard zones - in 2028	
Approximate Percentage of Commercial Businesses in flood hazard zones	35	35	Approximate Percentage of Commercial Businesses in flood hazard zones - in 2028	
Approximate Percentage of Commercial Businesses in earthquake hazard zones	100	100	Approximate Percentage of Commercial Businesses in earthquake hazard zones - in 2028	
Approximate Percentage of Commercial Businesses in wildland fire hazard zones	10	10	Approximate Percentage of Commercial Businesses in wildland fire hazard zones - in 2028	
Number of Critical Facilities in your Jurisdiction that are in flood hazard zones	40	40	Projected Number of Critical Facilities in your Jurisdiction that are in flood hazard zones - in 2028	
Number of Critical Facilities in your Jurisdiction that are in earthquake hazard zones	183	183	Number of Critical Facilities in your Jurisdiction that are in earthquake hazard zones - in 2028	
Number of Critical Facilities in your Jurisdiction that are in wildland fire hazard zones.	10	10	Number of Critical Facilities in your Jurisdiction that are in wildland fire hazard zones - in 2028	
Does your jurisdiction plan on participating in the County's on-going plan maintenance program every two years as described in Part I of the plan?	Yes	Yes	If not, how will your jurisdiction do plan maintenance?	
Will a copy of this plan be available for the various planning groups within your jurisdiction for use in future planning and budgeting?				Yes

APPENDIX C – CIP

The Capital Improvement Plan is updated each year. It covers capital projects including projects that mitigate various hazards. It can be found on the City budget page for the current fiscal year.

https://www.riversideca.gov/finance/budget.asp

APPENDIX D – PLAN REVIEW TOOL/CROSSWALK

WILL BE ATTACHED LATER