

SOLANO COUNTY

MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

VOLUME II

[CLICK TO JUMP TO ANNEX](#)

City of Benicia

City of Dixon

City of Fairfield

City of Rio Vista

City of Suisun City

City of Vacaville

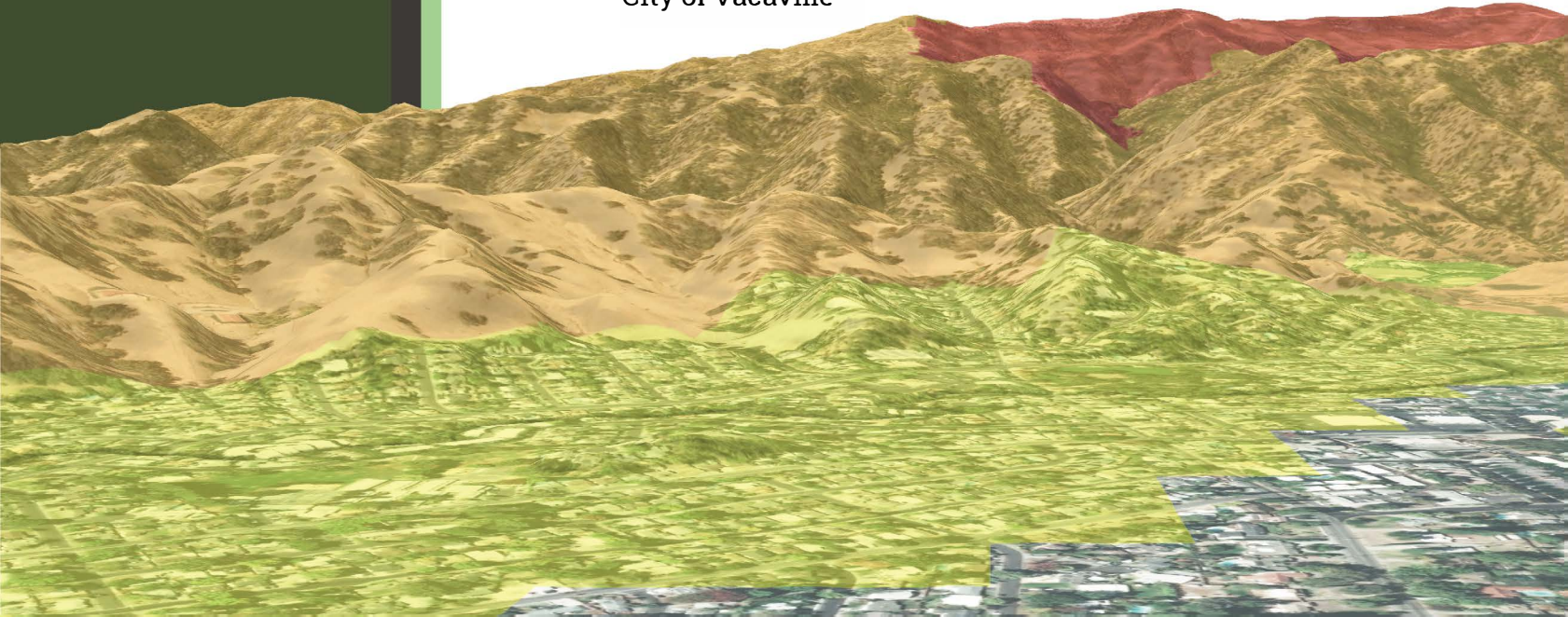
City of Vallejo

Solano County Water Agency

Solano Irrigation District

Vallejo Flood and Wastewater District

SHOWN BELOW
DP+S Composite Wildfire Layer Overlaying West Vacaville





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FEMA

July 13, 2022

Don Ryan
Director
Solano County Office of Emergency Services
530 Clay St.
Fairfield, CA 94533

Dear Don Ryan:

The Federal Emergency Management Agency (FEMA) received documentation from the Cities of Dixon and Vacaville, confirming their adoption of the *Solano County 2021 Multi-Jurisdictional Hazard Mitigation Plan*. These jurisdictions are in conformance with the Code of Federal Regulations, Title 44, Part 201, Section 6 (44 C.F.R. 201.6). An updated list of the status of participating jurisdictions is enclosed with this letter.

The adoption of this plan ensures the Cities of Dixon and Vacaville's continued eligibility for funding under FEMA's Hazard Mitigation Assistance programs, including the Hazard Mitigation Grant Program (HMGP), the Building Resilient Infrastructure and Communities program (BRIC), and the Flood Mitigation Assistance (FMA) program. All requests for funding are evaluated individually according to eligibility and other program requirements. Approved hazard mitigation plans may also be eligible for points under the National Flood Insurance Program's Community Rating System (CRS).

The *Solano County 2021 Multi-Jurisdictional Hazard Mitigation Plan* is valid for five years from the plan's original approval date, **March 15, 2022** for all approved participants. Prior to **March 15, 2027**, all participating jurisdictions must review, revise, and submit their plan to FEMA for approval to maintain eligibility for grant funding.

If you have any questions regarding the planning or review processes, please contact the FEMA Region 9 Hazard Mitigation Planning Team at fema-r9-mitigation-planning@fema.dhs.gov.

Sincerely,

Alison Kearns
Planning and Implementation Branch Chief
Mitigation Division
FEMA Region 9

Enclosure (1)

Status of Participating Jurisdictions, dated July 13, 2022

cc: Alison Kearns, Risk Analysis Branch Chief, FEMA Region 9
Jennifer Hogan, State Hazard Mitigation Officer, California Governor's Office of
Emergency Services
Victoria LaMar-Haas, Hazard Mitigation Planning Chief, California Governor's Office of
Emergency Services

Status of Participating Jurisdictions as of July 13, 2022

Jurisdictions – Adopted and Approved

#	Jurisdiction	Date of Adoption
1	Solano County	March 1, 2022
2	Benicia, City of	March 1, 2022
3	Dixon, City of	April 5, 2022
4	Fairfield, City of	March 1, 2022
5	Rio Vista, City of	March 15, 2022
6	Suisun City, City of	March 1, 2022
7	Solano County Water Agency	February 10, 2022
8	Vacaville, City of	June 14, 2022
9	Vallejo, City of	March 22, 2022
10	Vallejo Flood and Wastewater District	March 8, 2022

Jurisdictions – Approvable Pending Adoption

#	Jurisdiction

SECTION 1

JURISDICTIONAL ANNEX:

City of Benicia



SOLANO COUNTY

MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

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FINAL for adoption



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Solano County

Multi-Jurisdiction Hazard Mitigation Plan

CITY OF Benicia (BN.)

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Adoption Resolution

To comply with DMA 2000, the City of Benicia has officially adopted this Solano County Multi-Jurisdictional Hazard Mitigation Plan (MJHMP), Volume 1, and its jurisdictional annex. The adoption of the MJHMP recognizes the City’s commitment to reducing the impacts of natural hazards. See included adoption resolution.

RESOLUTION NO. 22- 27

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF BENICIA ADOPTING THE 2021 SOLANO COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

WHEREAS, the City of Benicia, a political subdivision of the State of California, is an official participating jurisdiction in the updated Solano Multi-Jurisdiction Hazard Mitigation Plan (MJHMP); and

WHEREAS, the City of Benicia recognizes the updated MJHMP as the official hazard mitigation plan for participating jurisdictions; and

WHEREAS, the City of Benicia has gathered information and prepared the updated MJHMP in accordance with Federal Emergency Management Agency (FEMA) requirements at 44 CFR § 201.6; and

WHEREAS, Volume 1 (Exhibit A) of the updated MJHMP recognizes the threat that natural hazards pose to people and property Solano County-wide; and

WHEREAS, Volume II (Exhibit B) of the updated MJHMP includes annexes specific to each participating jurisdiction's natural hazards and mitigation strategies; and

WHEREAS, the City of Benicia's Annex to Volume 1, included in Volume II and extracted separately for clarity, of the updated MJHMP provides additional information specific to the City of Benicia, with a focus on providing additional details on the planning process, risk assessment, and mitigation strategy for this community; and

WHEREAS, the City of Benicia has reviewed Volume 1 of the updated MJHMP and its Annex and affirms that the plan actions in Volume 1 and its Annex should reduce the potential for harm to people and property from future hazard occurrences within the community; and

WHEREAS, the U. S. Congress passed the Disaster Mitigation Act of 2000 ("Disaster Mitigation Act") emphasizing the need for pre-disaster mitigation of potential hazards; and

WHEREAS, the Disaster Mitigation Act made available mitigation grants to state and local governments; and

WHEREAS, an adopted hazard mitigation plan is required as a condition of future funding for mitigation projects under multiple FEMA pre- and post-disaster mitigation grant programs; and

WHEREAS, the City of Benicia fully participated in the FEMA-prescribed mitigation planning process to prepare this updated MJHMP; and

WHEREAS, the residents were afforded opportunities to comment and provide input in the updated MJHMP and the mitigation actions in the Plan; and

WHEREAS, the City of Benicia, as a fully participating jurisdiction of the updated MJHMP, is an eligible sub-applicant to the State of California under FEMA's hazard mitigation grant program guidance; and

WHEREAS, the California Office of Emergency Services (Cal OES), and the FEMA Region IX officials have reviewed the updated MJHMP, and approved it contingent upon this official adoption by the participating governing body; and

WHEREAS, the City of Benicia desires to comply with the requirements of the Disaster Mitigation Act and to augment its emergency planning efforts by formally adopting the updated MJHMP; and

WHEREAS, adoption by the governing body for the City of Benicia demonstrates the jurisdiction's commitment to fulfilling the mitigation goals and objectives outlined in this updated MJHMP; and

WHEREAS, adoption of this plan helps to coordinate the responsible agencies to carry out their responsibilities under the updated MJHMP.

NOW, THEREFORE, BE IT RESOLVED THAT the City Council of the City of Benicia does hereby find the facts mentioned above to be true and further finds that this City Council of the City of Benicia has jurisdiction to consider, approve, and adopt the subject of this Resolution.

BE IT FURTHER RESOLVED that the City Council of the City of Benicia does hereby adopt the updated Solano County Multi-Jurisdiction Hazard Mitigation Plan Volume 1 and its Annex, as approved by FEMA and Cal OES, as the official mitigation plan for the City of Benicia.

BE IT FURTHER RESOLVED that the City Council of the City of Benicia does hereby authorize the Solano County Emergency Services Manager to submit an approved and signed copy of this adoption resolution to the California Office of Emergency Services and FEMA Region IX officials to enable the plan's final approval in accordance with the requirements of the Disaster Mitigation Act of 2000.

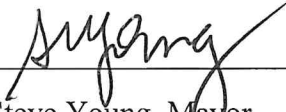
On motion of Council Member **Largaespada**, seconded by Council Member **Strawbridge**, the above Resolution was adopted by the City Council of the City of Benicia at a regular meeting of said Council held on the 1st day of March 2022 by the following vote:

Ayes: **Council Members Campbell, Largaespada, Macenski, Strawbridge, and Mayor Young**

Noes: **None**

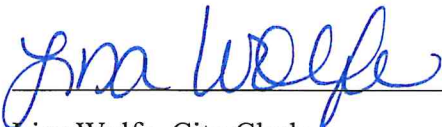
Absent: **None**

Abstain: **None**



Steve Young, Mayor

Attest:



Lisa Wolfe, City Clerk



Date



Section 1. City of Benicia

1.1 Purpose

This Annex details the hazard mitigation planning elements specific to the City of Benicia. This Annex is not intended to be a standalone document but appends to and supplements the information contained in the umbrella plan document. As such, all sections of the umbrella plan, including the planning process and other procedural requirements apply to and were met by the City of Benicia. This Annex provides additional information specific to the City of Benicia, with a focus on providing additional details on the planning process, risk assessment, and mitigation strategy for this community.

Hazard Mitigation Plan Points of Contact

Primary Point of Contact

Della Olm, Management Analyst
City of Benicia
250 East L Street,
Benicia, CA 94510
Telephone: (707) 746-4272
e-mail: dolm@ci.benicia.ca.us

Alternate Point of Contact

Josh Chadwick, Fire Chief
City of Benicia
250 East L Street,
Benicia, CA 94510
Telephone: (707) 746-4275
e-mail: jchadwick@ci.benicia.ca.us

1.2 Planning Methodology

The City of Benicia followed the planning process detailed in Volume 1, Section 3, including participating in the County Hazard Mitigation Planning Committee (HMPC) and Steering Committee and formulating their own internal planning team to support the broader planning process. Internal planning participants, their positions, and how they participated in the planning process are shown in Table 1-1.

Table 1-1: Planning Committee Members

Planning Committee Members	Department
Della Olm	Management Analyst
Josh Chadwick	Fire Chief
Dan Sequeria	Principal Civil Engineer
Danielle Crider	Associate Planner
Rachel O'Shea	Chief Building Official
Rick Knight	Project Manager
Suzanne Thorsen	Planning Manager
Terri Davena	Economic Development Specialist
Vic Randall	Senior Planner

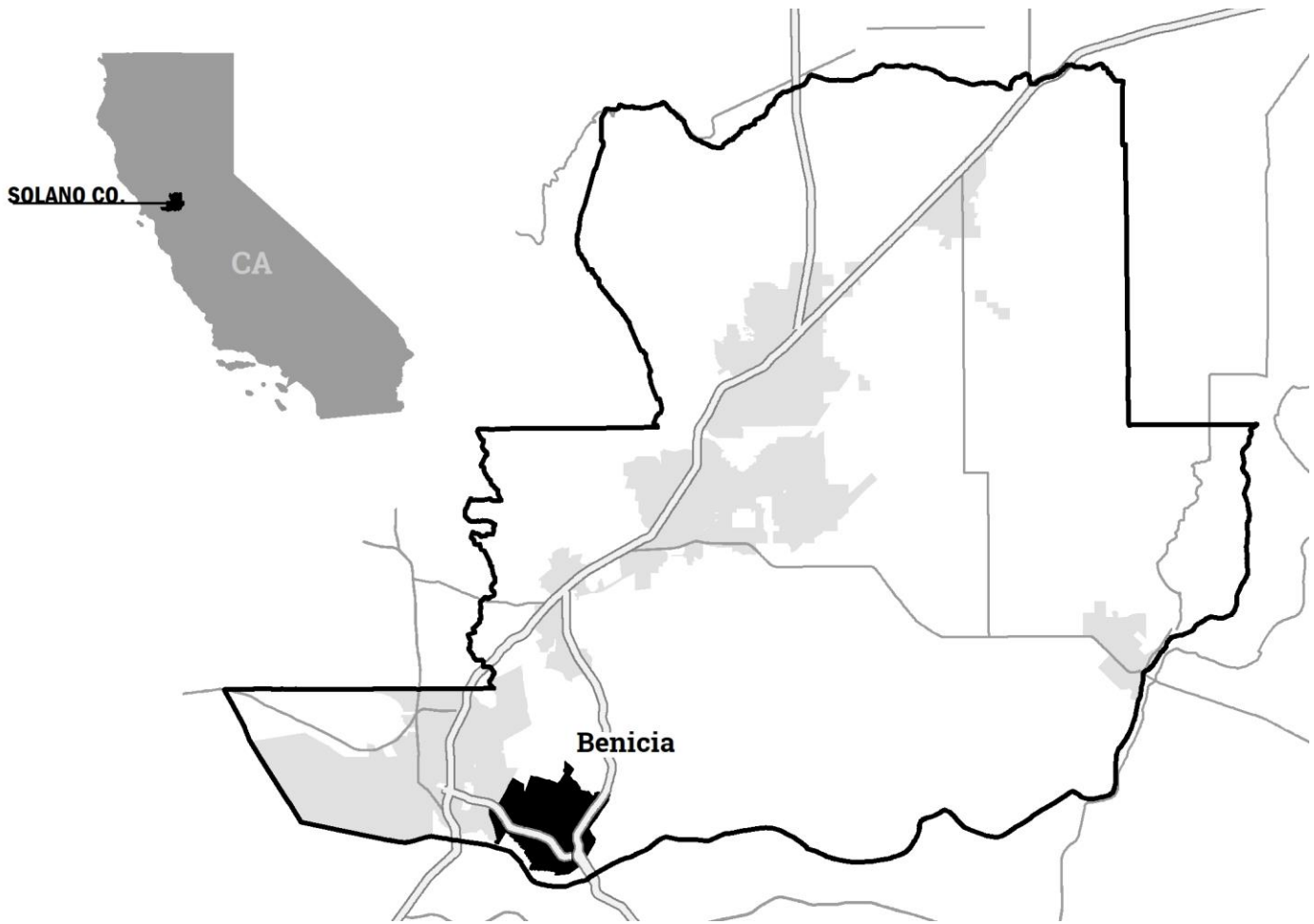


Figure 1-1: City of Benicia Location

1.3 What's New

The City of Benicia has been making improvements toward reducing natural hazard risks to life and property since the existing LHMP was adopted.

The City reevaluated previous mitigation actions. Some mitigation actions have been completed and are highlighted in Table 1-3. The City determined to reprioritize some for lack of funding, or other listed reasons. Table 1-2 lists reprioritized mitigation actions along with an explanation for why. Other mitigation actions are pending or ongoing and are included in Table 1-18.



Table 1-2: Cancelled Mitigation Actions

Mitigation No.	Hazard Type	Status	Year	Primary Agency	Title/Description	Responsible Party	Reason Cancelled
ma-TR-BN-91	Terrorism	Cancelled	2017	City of Benicia	Creation of a complete plan and subsequent training and evaluation of the vulnerability of the community to an active shooter or terrorist event creating mass casualties	Police Department	Not a natural hazard under FEMA's HMA program; not prioritized.

1.3.1 Mitigation Successes

Table 1-3 displays multiple important mitigation actions that have been completed by the City of Benicia. The following describes the City's applicable success stories.

Table 1-3: Completed Mitigation Actions

Mitigation No.	Hazard Type	Status	Year	Primary Agency	Title/Description	Responsible Party
ma-AH-BN-97	All Hazard	Completed	2017	City of Benicia	Increase Community Preparedness by Providing Outreach and Information	Fire, Community Development, others
ma-DR-BN-81	Drought	Completed	2017	City of Benicia	Update Urban Water Management Plan	Public Works Department
ma-DR-BN-92	Drought	Completed	2017	City of Benicia	Prepare feasibility study for a water reuse project	Public Works Department
ma-FL-BN-94	Flood	Completed	2017	City of Benicia	Participate in the Storm Ready Community, National Weather Service program	Fire Department; CDD and PW will be involved

Defensible Space Program and Site-Specific Assessment Project: The City of Benicia is developing a plan for vegetation management in the City’s open spaces in order to reduce wildfire risk to the residents surrounding these spaces.

The program involves a report that will serve as a site-specific assessment and report that provides a framework for understanding vegetation/natural resources, fire behavior, and financial investments needed to maintain vegetation in the City’s open spaces.

Adoption of the City of Benicia 2020 Urban Water Management Plan: The City of Benicia recently updated their Urban Water Management Plan in order to ensure that the City has secured adequate water supplies for its customers during normal years, a driest year, and multiple dry years. The plan secures water supplies through 2045.

Improving Community Preparedness through public engagement/outreach: Public education is a vital part of the City of Benicia’s community risk reduction efforts. The department provides several forms of public education on a recurrent basis ranging from station tours, school site visits, the Benicia Certified Farmers Market, their Annual Open House, Pictures with Santa, and daily interactions while out in the community. The combined outreach from these programs reach nearly 5,000 Benicia residents each year. They reach approximately 20,000 residents each year via social media platforms including Facebook, Twitter, Instagram, and Nexdoor.

City Evacuation Plan added to EOP along with Community Outreach: The City recently created an evacuation plan for the citizens to use in the event of a disaster. Should there be a large-scale emergency or utility failure, citizens will be directed to use the designated exit routes that have been identified and mapped out. A mandatory evacuation order requires the immediate movement of people out of an affected



Figure 1-2: Benicia Fuel Reduction / Veg Management
Source: Marnix A. van Ammers, Patch Staff



Figure 1-3: Public Presentation from City
Source: City of Benicia Staff



area due to an emergency, including a natural hazard event. The public will be alerted by a variety of ways, including public announcements through the Benicia Channel 27 and City of Benicia Social Media Platforms, door-to-door notifications, text messages, phone calls, and emails through ALERT SOLANO.

1.4 Risk Assessment

The intent of this section is to profile the City of Benicia's hazards and assess the City's vulnerabilities, distinct from that of the County wide planning area. The hazard profiles in Volume 1 discuss overall impacts to the planning area and describes the hazard problem description, hazard extent, magnitude/severity, previous occurrences of hazard events and the likelihood of future occurrences. For more information on Risk Assessment Methodologies, see Vol. 1 and Appendix A.

1.4.1 Hazard Screening Criteria

Planning Team members from each participating jurisdiction collectively discussed which hazards should be profiled in the Plan and which should not. The results of that discussion can be found in Table 1-4. Detailed hazard profiles of the most significant County wide hazards are described in Section 4 of Volume 1. The Planning Team reviewed previously-prepared hazard mitigation plans and other relevant documents to determine the realm of natural hazards that have the potential to affect the City of Benicia. Table 1-5 provides a crosswalk of hazards identified in Vol. 1 of this plan, the City of Benicia General Plan, and 2018 California State Hazard Mitigation Plan. The crosswalk was used to develop a preliminary hazards list, providing a framework for the Planning Team members to evaluate which hazards were truly relevant to the City of Benicia and which ones were not. Section 1.4.2 below describes the hazard risk ranking process that was performed by the planning team which prioritized hazards that are specifically relevant to the City of Benicia.



Table 1-4: County-Wide Hazard Prioritization

Hazard Type	Explanation
Climate Change	High priority county-wide, profiled hazard.
Dam/ Levee failure	Dam failure is possible in Solano County but is best addressed in other plans, specifically Emergency Action Plans for high hazard dams affecting Solano County.
Drought	High priority county-wide, profiled hazard.
Earthquake/ Geologic Hazards	High priority county-wide, profiled hazard.
Flood	High priority county-wide, profiled hazard.
Hazardous Material	While hazardous materials can release and impact the County, there are better avenues to address this hazard outside this plan.
High Winds/ Straight Line Winds	High priority county-wide, profiled as part of Extreme Weather.
Insect Hazards	While hazardous insects exist in Solano County, this was not considered a priority and is not profiled in this plan.
Pandemic Disease	While pandemic disease can impact the County, there are better avenues to address this hazard outside this plan.
Extreme Weather, including:	High priority county-wide for high wind, heavy rain, and high heat.
Extreme Heat	Profiled as part of Extreme Weather.
Hail	Hail events are rare and not considered a priority.
High Wind	Profiled as part of Extreme Weather.
Heavy Rain	Profiled as part of Extreme Weather.
Fog	Fog events are rare and are not considered a priority.
Lightning	Not a priority as an extreme weather event; discussed as source of wildfire.
Severe Thunderstorm	Severe thunderstorms were not identified as a priority in this plan.
Winter Storm / Extreme Cold/ Freeze Events	Winter storms are rare in Solano County and not identified as a priority for this plan.
Slope Failure	High priority county-wide, profiled hazard.
Soil Hazards	While limited soil hazards exist in Solano County (erosion and shifting soils), these are not prioritized in this plan. Erosion discussed under flood hazard.
Terrorism/Human Caused Threats	While terrorism is certainly a threat to the County and participating jurisdictions, it is best addressed in other plans as this HMP does not address human-caused threats.
Tornado	Impacts to the County from tornados are extremely unlikely, if any.
Volcanic Activity	Due to distance from volcanoes and the limited chance of an eruption, this hazard was not identified as a priority.
Wildfire	High priority county-wide, profiled hazard.



Table 1-5: City Document Review Crosswalk

Hazards	2014 Solano County HMP	2017 Benicia LHMP	1999 Benicia General Plan	2018 California State HMP
Agricultural Pests				■
Climate Change	■			■
Dam Failure	■			■
Drought	■	■		■
Earthquake	■	■	■	■
Flood	■	■	■	■
Insect Hazards				
Landslide	■	■	■	■
Levee Failure				■
Manmade Hazards			■	■
Pandemic Disease				■
Sea Level Rise	■		■	■
Severe Weather	■	■		■
Soil Hazards			■	■
Terrorism & Tech Hazards		■		■
Tsunami		■		■
Volcano				■
Wildfire	■	■	■	■

1.4.2 Hazard Risk Ranking

The City of Benicia’s Planning Team used the same hazard prioritization process as the Solano County Hazard Mitigation Planning Committee. This process is described in detail in Section 4.3.1 of Vol. 1. Figure 1-4 displays the results of the hazard risk ranking exercise that was performed by the Planning Team. The Planning Team chose to assess the City of Benicia’s vulnerability to the following hazards:

- Wildfire
- Extreme Weather (high heat, heavy rain, high wind)
- Flood
- Drought
- Earthquake
- Climate Change

All of these hazards have been profiled in Vol. 1 of this document. The purpose of this annex to specifically address the City of Benicia’s vulnerability to these specifically-identified hazards.

1.4.3 Vulnerability Assessment

Assessing vulnerabilities exposes the unique characteristics of individual hazards and begins the process of narrowing down which areas within the City of Benicia are vulnerable to specific hazard events. The vulnerability assessment considered unique local knowledge of hazards and impacts and a GIS overlaying method for examining such vulnerabilities more in depth. Using these methods, participating jurisdictions estimated vulnerable populations, infrastructure, and potential losses from hazards.



1.4.3.1 Risk Assessment

Each participating jurisdiction developed a risk matrix that assessed the probability and impact of various hazards within the jurisdiction. Figure 1-4 is the jurisdiction's risk assessment, which was completed in part using the web based and interactive Risk Assessment Mapping Platform (RAMP), accessed via the project website at www.mitigatehazards.com. RAMP allows interactive discovery of robust risk, vulnerability, and exposure data developed especially for Solano County. RAMP is a mapping platform built specifically for mitigation planning. It displays County/jurisdiction facilities and buildings overlaid with natural hazards layers to bring interactivity and individual discovery to the GIS analysis performed for the MJHMP. See Vol. 1 for a detailed description of RAMP. The Planning Team used RAMP in meetings and as needed to understand vulnerabilities to the City of Benicia. Users interactively filter facilities and buildings by natural hazard zones and/or construction characteristics. The City of Benicia did not conduct a more detailed climate vulnerability assessment as an appendix, as the City is initiating more in-depth climate work. The climate vulnerability assessment analyzed climate-related vulnerabilities by considering the impact from the climate vulnerability and the community's adaptive capacity to respond to the particular vulnerability.

1.4.3.2 Snapshot Exposure Maps & Damage Estimation

The included snapshot maps and damage estimation tables illustrate the City of Benicia's vulnerability to specific hazards. Based on the risk assessment, the snapshot maps focus on those hazards prioritized by the jurisdiction. These maps helped the Planning Team understand the exposure of population, parcels, and critical infrastructure to specific hazards. Each map contains an exposure summary that displays the percent of the population, the improvement and content value of parcels, and the amount of critical infrastructure that is exposed to each respective hazard. For flood and earthquake, detailed damage estimations were conducted through FEMA's Hazus software and are shown in tabular form. Additional mapping is also included. Figures and tables include:

- Figure 1-5: City of Benicia – Mean Fire Return Interval
- Figure 1-6: City of Benicia – Wildfire Risk Exposure
- Figure 1-7: City of Benicia – FEMA Flood Risk Exposure
- Table 1-6: City of Benicia – Damage Estimate Summaries, 100YR Flood
- Table 1-7: City of Benicia – Damage Estimate Summaries, 500 YR Flood
- Table 1-8: City of Benicia – Damage Estimate Summaries, 100YR Coastal Flood
- Figure 1-8: City of Benicia – BAM 200-YR Flooding and Awareness Zones
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- Figure 1-16: City of Benicia–Drought Severity Timeline – Suisun Bay
- Figure 1-17: City of Benicia – RCP Comparison
- Figure 1-18: City of Benicia – Sea Level Rise



Risk Assessment Matrix Definitions

PROBABILITY RATING

The likelihood of a hazard event occurring within a time period?

PROBABILITY	Highly Likely	Highly likely - 100% annual probability. Or likely to occur every year in your lifetime.
	Likely	Likely - Between 10 and 100% annual probability. Or will occur several times in your lifetime.
	Possible	Possible - Between 1 and 10% annual probability. Or likely to occur some time in your lifetime.
	Unlikely	Unlikely - Less than 1% annual probability. Or unlikely but possible to occur in your lifetime.

IMPACT RATING

In terms of injuries, damage, or death, would you anticipate impacts to be minor, limited, critical, or catastrophic when a significant hazard event occurs? The impact could be in terms of one hazard event (flooding from a culvert failure) or a large-scale event (multiple rivers flooding) in the same jurisdictional boundary.

IMPACT			
Minor	Limited	Critical	Catastrophic

Minor - Very few injuries, if any. Only minor property damage and minimal disruption on quality of life. Temporary shutdown of critical facilities.

Limited - Minor injuries only. Approx. 10% or less of property in disaster footprint damaged or destroyed. Complete shutdown of critical facilities for more than one day.

Critical - Multiple deaths/injuries possible. Between 25% and 50% of property in disaster footprint is damaged or destroyed. Complete shutdown of critical facilities for more than one week.

Catastrophic - High number of deaths/injuries possible. More than 50% of property in affected area damaged or destroyed. Complete shutdown of critical facilities for 30 days or more.

To concentrate resources on highest priority hazards, the jurisdictional planning team will focus on "High" and "Extreme" risk hazards in this annex. These hazards have higher probability and greater impact as it relates to the jurisdiction's planning area.

Hazard definitions are included in Vol. 1 of this plan.

Hazard Information / Legend:



Climate Change is prioritized for all jurisdictions.

Sea-Level Rise is a subhazard of climate change for some jurisdictions (County, Vallejo, Benicia, Suisun City, Fairfield).



Extreme Weather in Solano County includes high heat, high wind, and heavy rain.

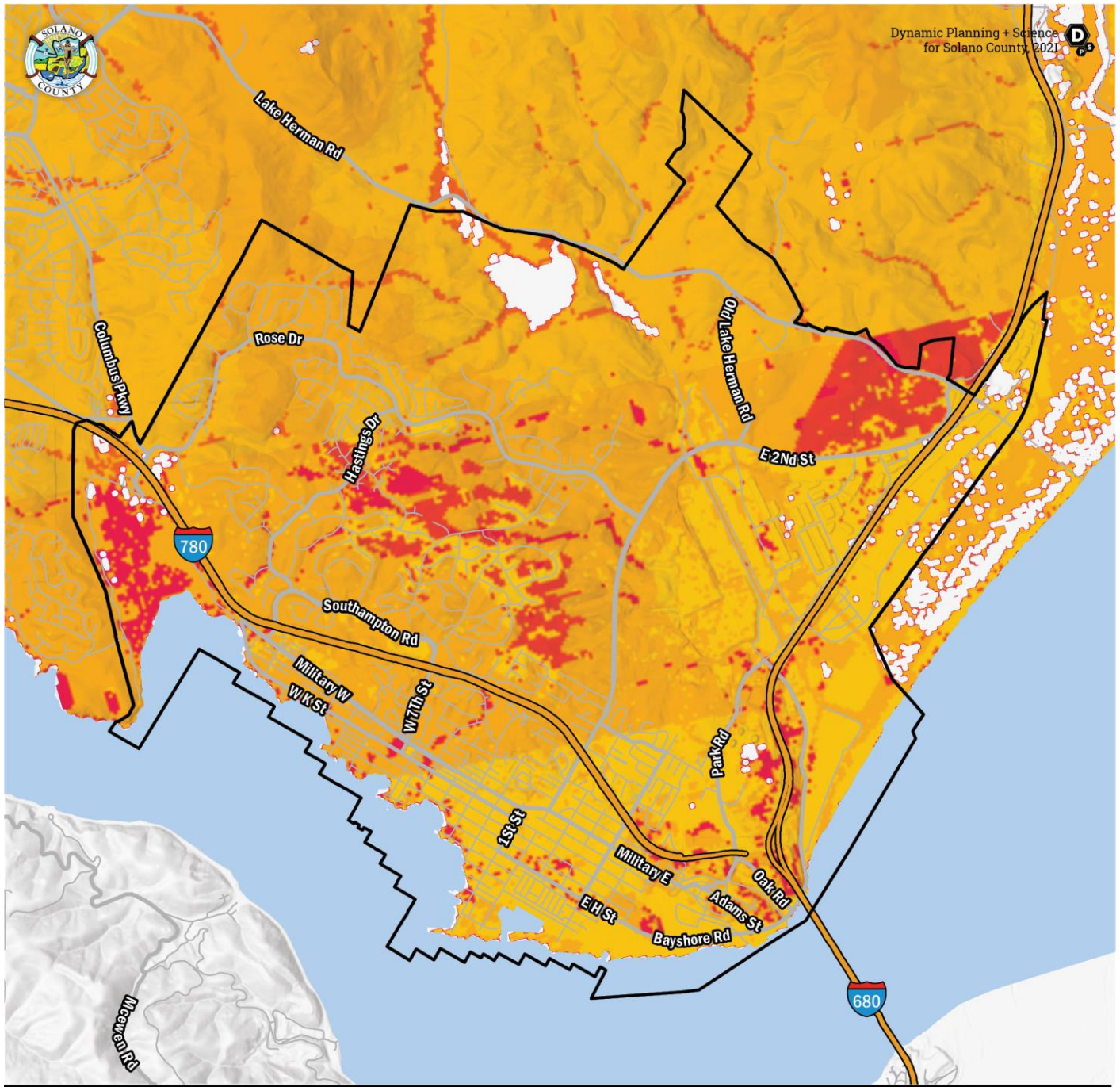


If a hazard symbol is grey, the planning team did not develop hazard vulnerability information due to lower perceived probability and impact.

City Of Benicia Risk Matrix

		IMPACT			
		Minor	Limited	Critical	Catastrophic
PROBABILITY	Highly Likely	Medium	DROUGHT WILDFIRE	EXTREME WEATHER	Extreme
	Likely	Medium	FLOOD	High	Extreme
	Possible	SLOPE FAILURE	Medium	EARTHQUAKE	High
	Unlikely	Low	Low	Medium	Medium

Figure 1-4: City of Benicia Risk Assessment



MEAN FIRE RETURN INTERVAL BENICIA

*Data sources: USGS LANDFIRE.

AVERAGE PERIOD BETWEEN FIRES (YEARS)

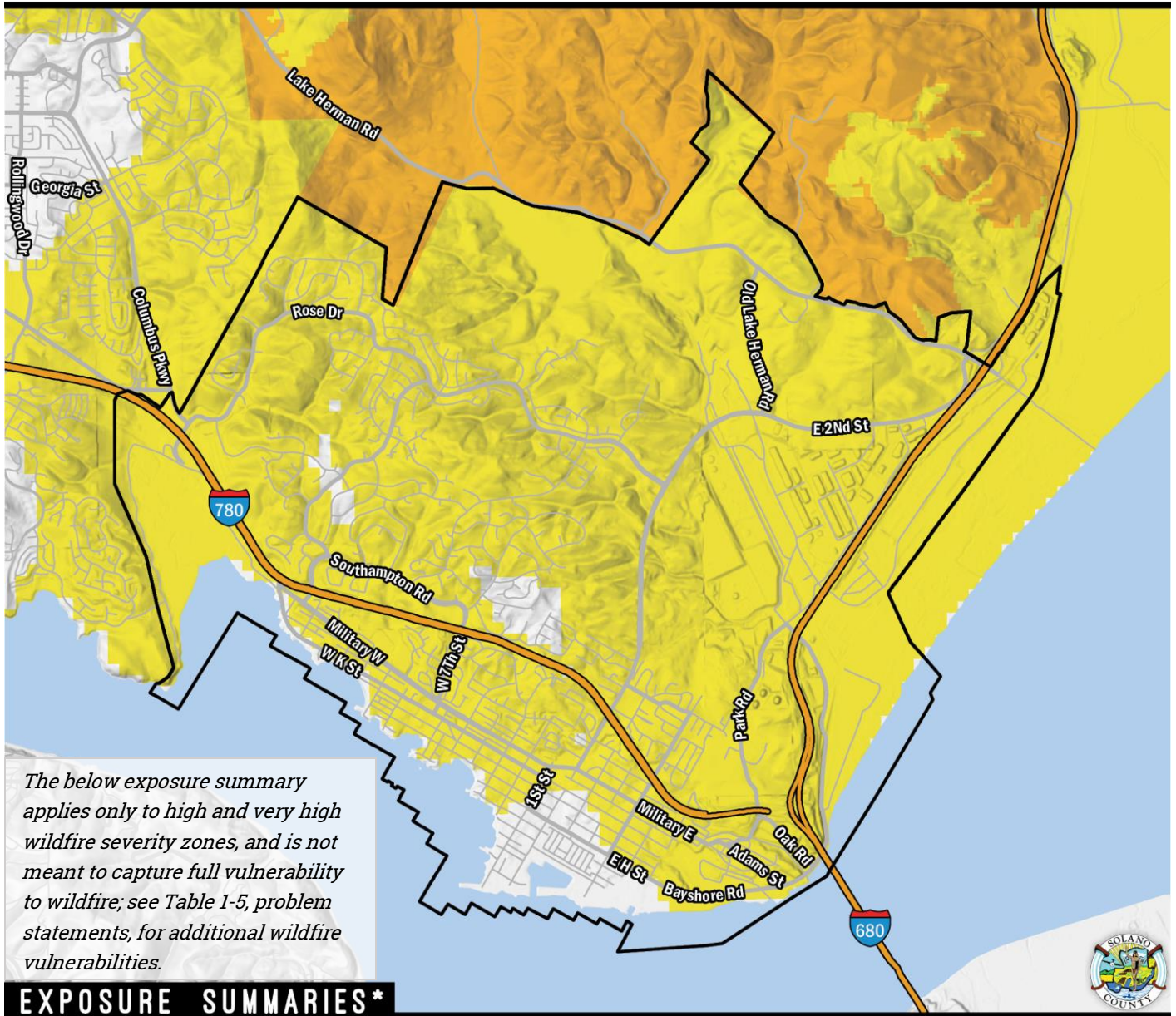


Figure 1-5: City of Benicia – Mean Fire Return Interval



WILDFIRE RISK EXPOSURE

BENICIA



The below exposure summary applies only to high and very high wildfire severity zones, and is not meant to capture full vulnerability to wildfire; see Table 1-5, problem statements, for additional wildfire vulnerabilities.

EXPOSURE SUMMARIES*

POPULATION COUNT IN HAZARD AREA		PARCEL COUNT IN HAZARD AREA		PARCEL VALUE IN HAZARD AREA		CRITICAL INFRASTRUCTURE COUNTS IN HAZARD AREA			
Count	Exp. Rate**	Count	Exp. Rate**	Sum of Improvement Value	Exp. Rate**	Infrastructure Category	Count	Exp. Rate**	Count/Sum Includes:
67	0%	0	0%	\$0	0%	Essential Facilities	0	0%	H VH
Count Includes: H VH		Count Includes: H VH		Sum of Content Value	0%	High Potential Loss	0	0%	Sum of Transportation & Lifeline Linear Mileage
Count Includes: H VH		Count Includes: H VH		\$0	0%	Transportation & Lifeline	0	0%	

MAP LEGEND

- MODERATE
- HIGH (H)
- VERY HIGH (VH)

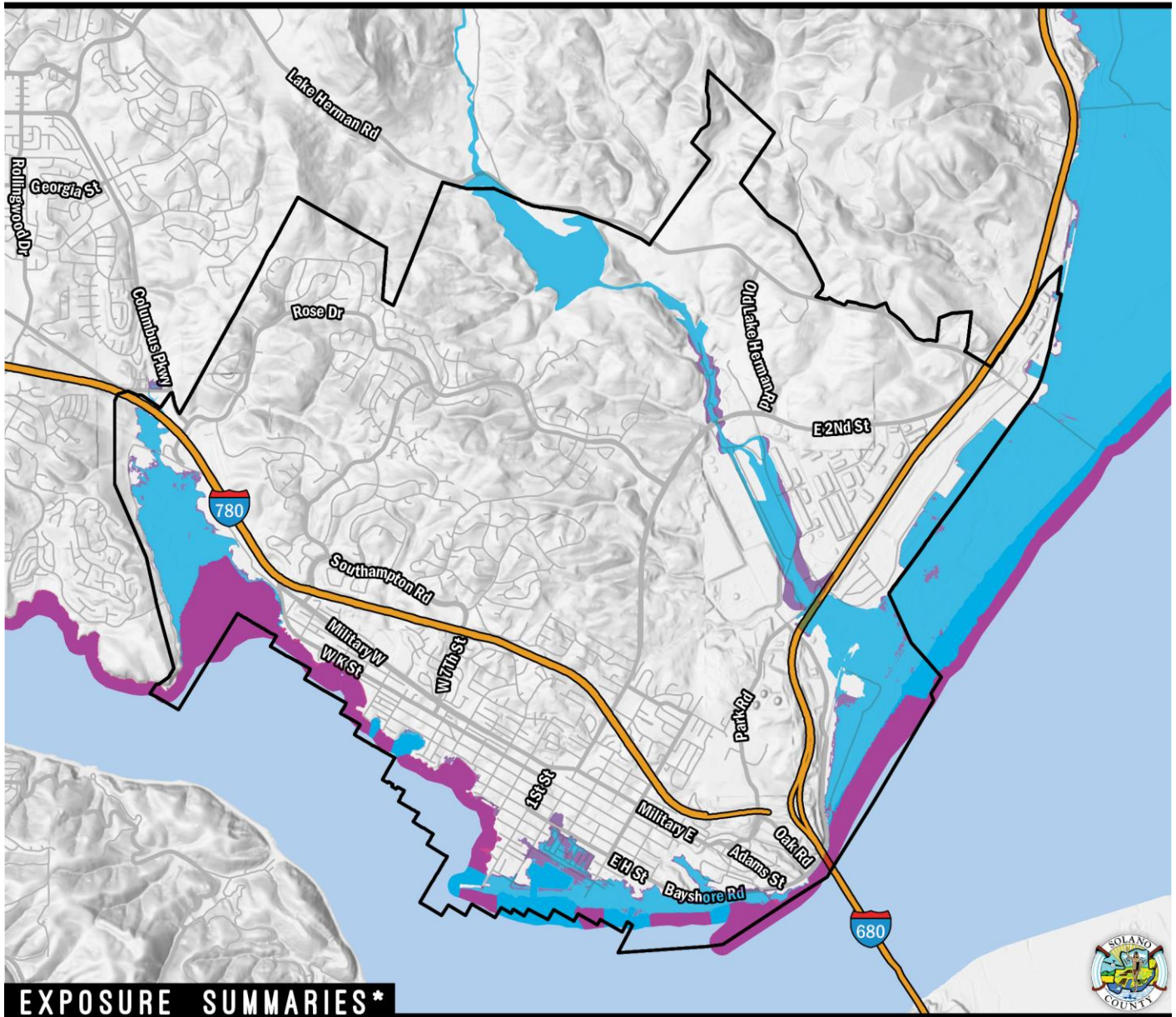
*Exposure summaries include high and very high risk areas. Hazard data source: Cal Fire, CPUC.
 **Exposure Rate - Exposed summary or count as a percentage of total summary or count within jurisdiction.
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Figure 1-6: City of Benicia – Wildfire Risk Exposure



FEMA FLOOD RISK EXPOSURE

BENICIA



EXPOSURE SUMMARIES*

POPULATION COUNT IN HAZARD AREA		PARCEL COUNT IN HAZARD AREA		PARCEL VALUE IN HAZARD AREA		CRITICAL INFRASTRUCTURE COUNTS IN HAZARD AREA				
Count	Exp. Rate**	Count	Exp. Rate**	Sum of Improvement Value	Exp. Rate**	Infrastructure Category	Count	Exp. Rate**	Count/Sum Includes:	
2,296	8%	162	2%	\$164,746,628	3%	Essential Facilities	0	0%	100 + + 500	
Count Includes: 100 + + 500		Count Includes: 100 + + 500		Sum of Content Value		High Potential Loss	34	11%	Sum of Transportation & Lifeline Linear Mileage	
				\$175,222,401	4%	Transportation & Lifeline	10	4%	20	8%
				Count Includes: 100 + + 500						

MAP LEGEND

- 100-YR (Light Blue)
- COASTAL (Pink)
- AREA PROTECTED BY LEVEE (Yellow)
- 500-YR (Purple)

*Exposure summaries include 100-year and 500-year flood zone areas, including coastal and leveed areas. Hazard data source: FEMA.
 **Exposure Rate - Exposed summary or count as a percentage of total summary or count within jurisdiction.

Figure 1-7: City of Benicia – FEMA Flood Risk Exposure



Table 1-6: City of Benicia – Damage Estimate Summaries, 100YR Flood

Building Type	Building Damage (\$)	Building Damage (% of total loss)	Content Damage (\$)	Content Damage (% of total loss)	Total Damage (\$)	Proportion of Loss (%)
Agriculture	\$0	0.0%	\$0	0.0%	\$0	0%
Commercial	\$650,835	1.4%	\$2,132,143	4.5%	\$2,782,978	6%
Education*	\$0	0.0%	\$0	0.0%	\$0	0%
Emergency	\$0	0.0%	\$0	0.0%	\$0	0%
Government	\$1,471,181	3.1%	\$6,144,674	12.9%	\$7,615,855	16%
Industrial	\$8,731,613	18.3%	\$25,649,558	53.7%	\$34,381,172	72%
Religion	\$0	0.0%	\$0	0.0%	\$0	0%
Residential	\$2,142,338	4.5%	\$838,469	1.8%	\$2,980,806	6%
Total	\$12,995,967	27%	\$34,764,843	73%	\$47,760,811	

*School district asset information not available during time of Hazus analysis.

Note: Total Inventory Values

1 - Building Replacement Costs = \$3,773,922,295

2 - Content Replacement Costs = \$2,667,166,517

3 - Total Value = \$6,441,088,812

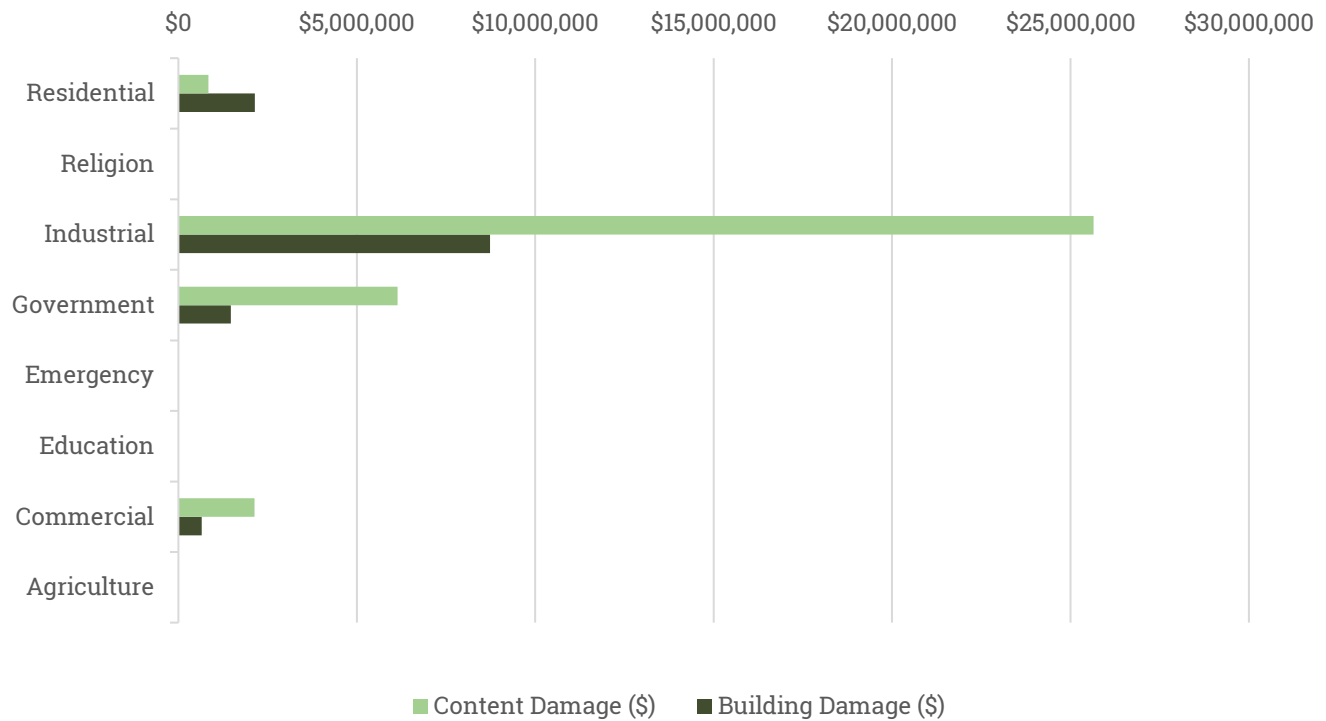




Table 1-7: City of Benicia – Damage Estimate Summaries, 500 YR Flood

Building Type	Building Damage (\$)	Building Damage (% of total loss)	Content Damage (\$)	Content Damage (% of total loss)	Total Damage (\$)	Proportion of Loss (%)
Agriculture	\$0	0.0%	\$0	0.0%	\$0	0%
Commercial	\$0	0.0%	\$0	0.0%	\$0	0%
Education*	\$0	0.0%	\$0	0.0%	\$0	0%
Emergency	\$0	0.0%	\$0	0.0%	\$0	0%
Government	\$0	0.0%	\$0	0.0%	\$0	0%
Industrial	\$2,191	0.2%	\$0	0.0%	\$2,191	0%
Religion	\$0	0.0%	\$0	0.0%	\$0	0%
Residential	\$785,942	70.3%	\$329,918	29.5%	\$1,115,860	100%
Total	\$788,133	70%	\$329,918	30%	\$1,118,051	

*School district asset information not available during time of Hazus analysis.

Note: Total Inventory Values

1 - Building Replacement Costs = \$3,773,922,295

2 - Content Replacement Costs = \$2,667,166,517

3 - Total Value = \$6,441,088,812

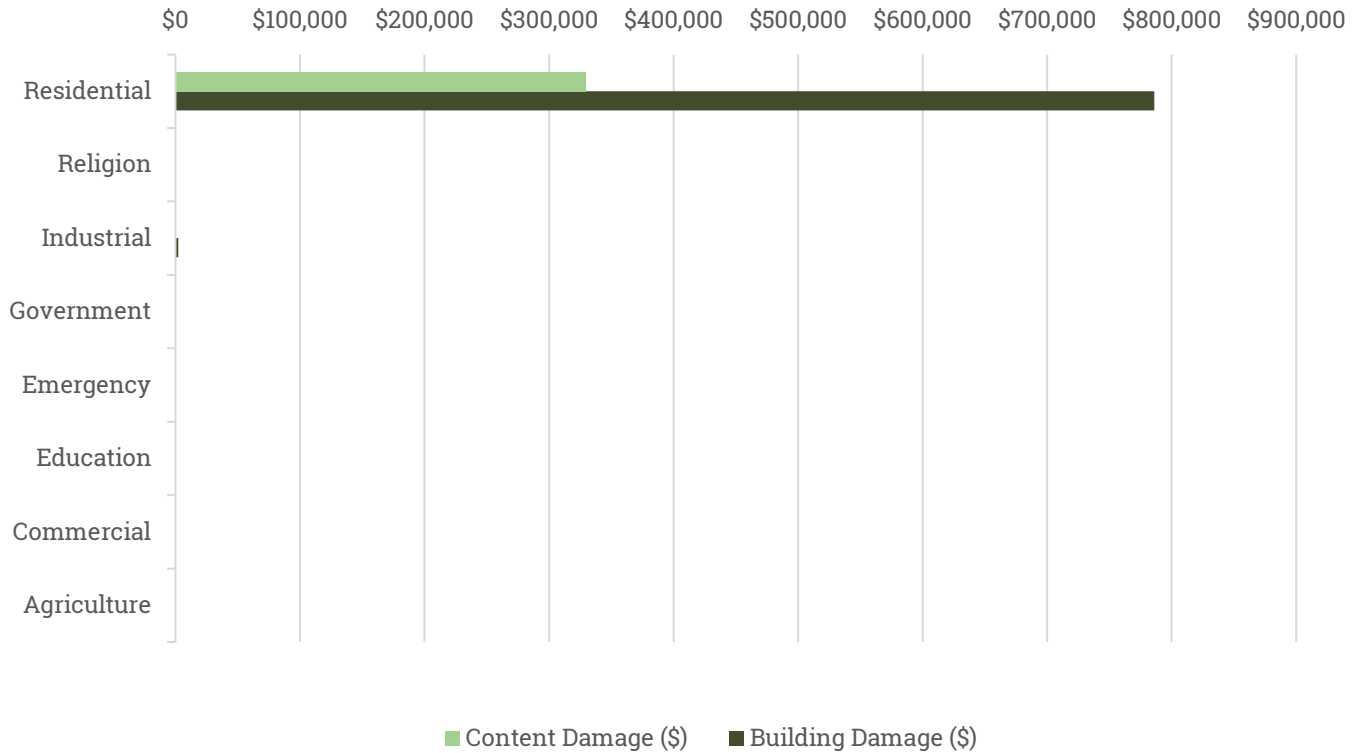




Table 1-8: City of Benicia – Damage Estimate Summaries, 100YR Coastal Flood

Building Type	Building Damage (\$)	Building Damage (% of total loss)	Content Damage (\$)	Content Damage (% of total loss)	Total Damage (\$)	Proportion of Loss (%)
Agriculture	\$0	0.0%	\$0	0.0%	\$0	0%
Commercial	\$16,061	17.2%	\$43,979	47.1%	\$60,040	64%
Education*	\$0	0.0%	\$0	0.0%	\$0	0%
Emergency	\$0	0.0%	\$0	0.0%	\$0	0%
Government	\$0	0.0%	\$0	0.0%	\$0	0%
Industrial	\$0	0.0%	\$0	0.0%	\$0	0%
Religion	\$0	0.0%	\$0	0.0%	\$0	0%
Residential	\$20,860	22.3%	\$12,531	13.4%	\$33,391	36%
Total	\$36,921	40%	\$56,510	60%	\$93,431	

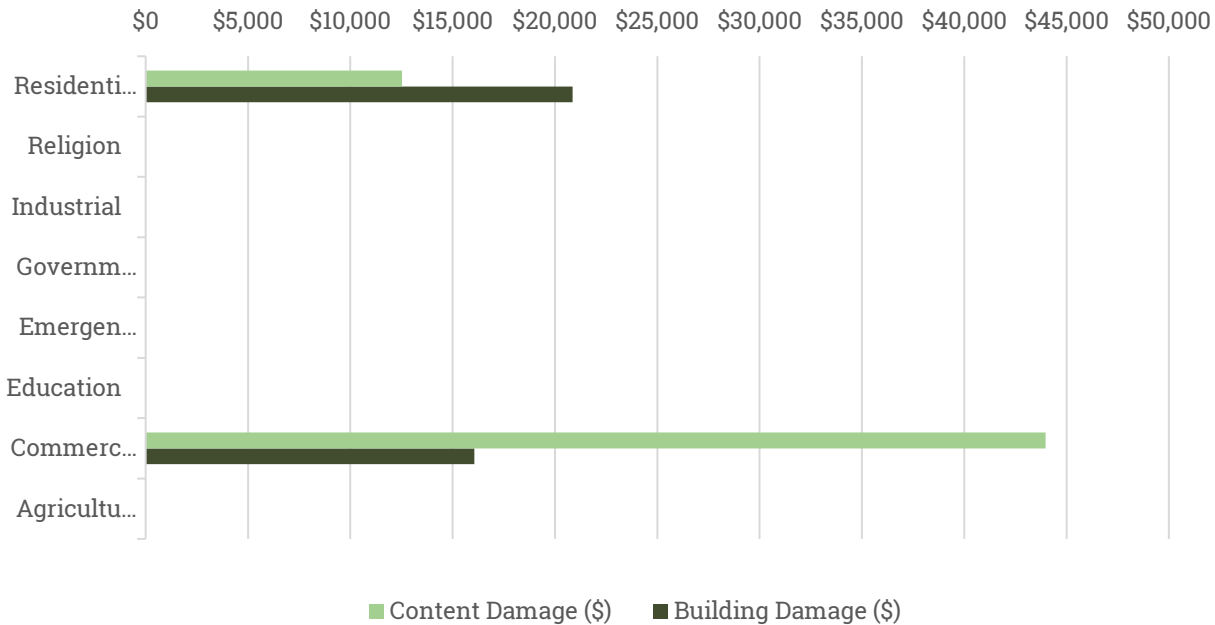
*School district asset information not available during time of Hazus analysis.

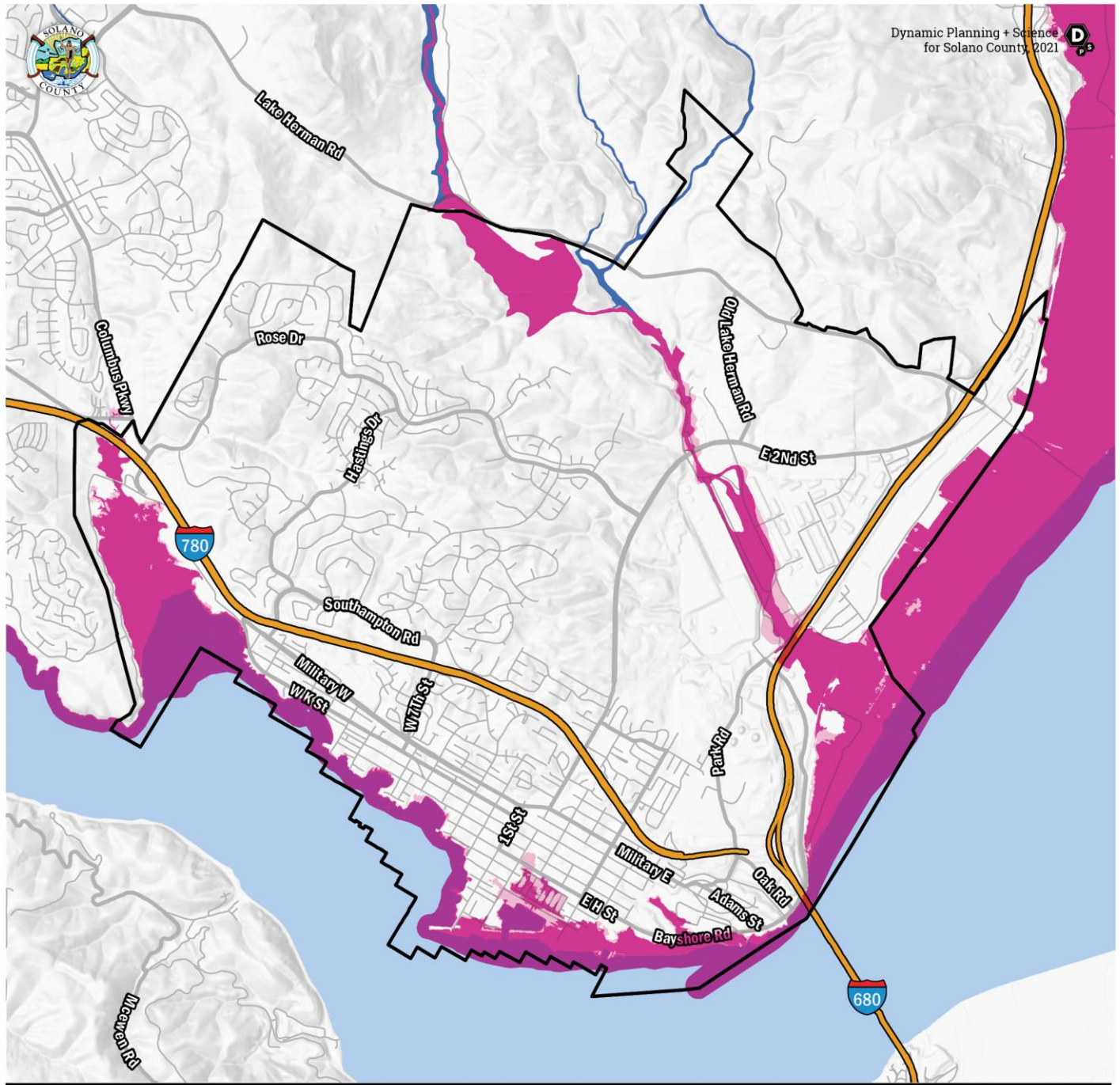
Note: Total Inventory Values

1 - Building Replacement Costs = \$3,773,922,295

2 - Content Replacement Costs = \$2,667,166,517

3 - Total Value = \$6,441,088,812





BAM 200-YR FLOODING AND AWARENESS ZONES BENICIA

*Data sources: DWR.

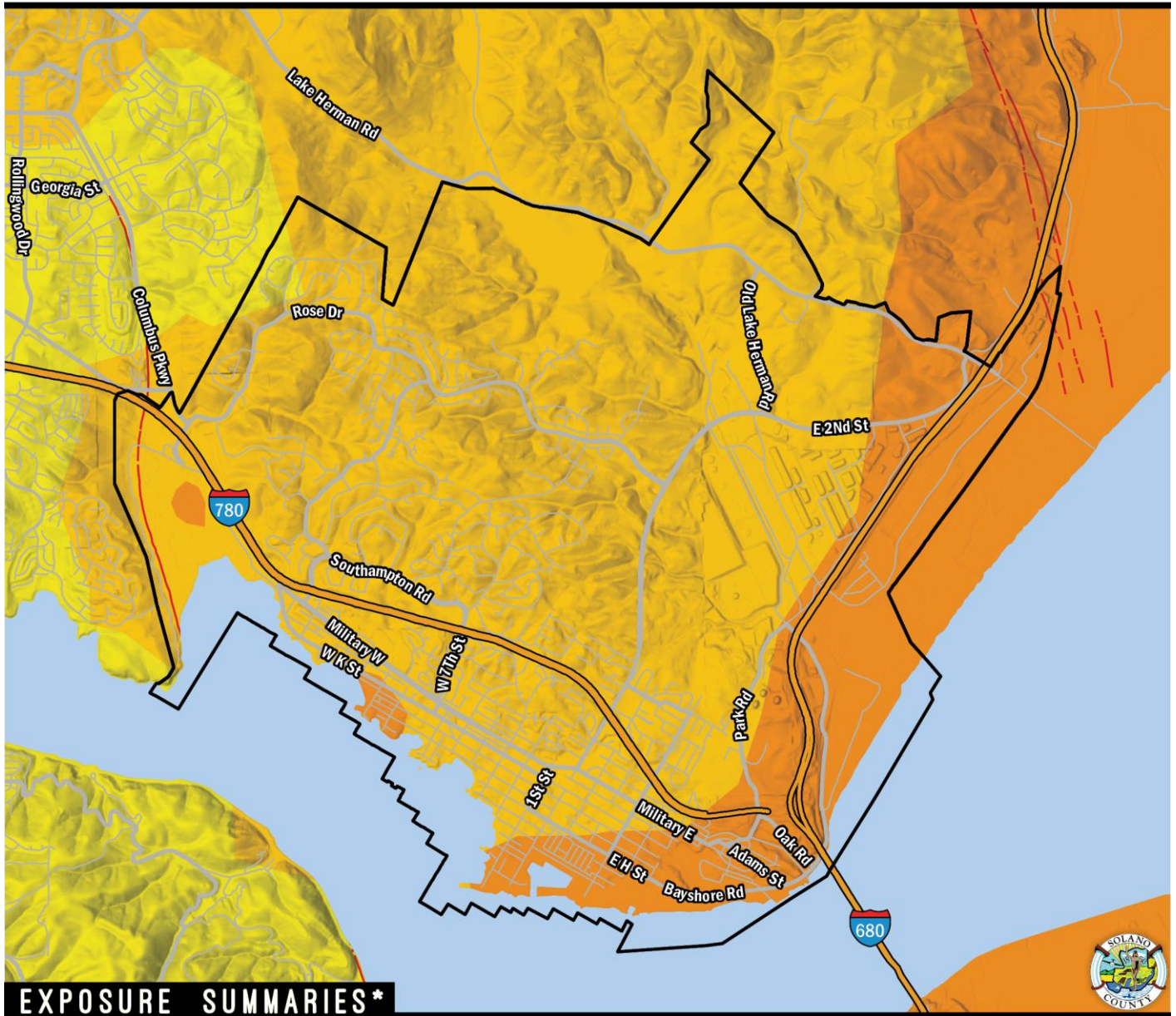


Figure 1-8: City of Benicia – BAM 200-YR Flooding and Awareness Zones



CONCORD-GREEN VALLEY EARTHQUAKE SCENARIO (M6.8)

BENICIA



EXPOSURE SUMMARIES*

POPULATION COUNT
IN HAZARD AREA

Count	Exp. Rate**
28,088	100%
Count Includes: S+++E	

PARCEL COUNT
IN HAZARD AREA

Count	Exp. Rate**
9,517	100%
Count Includes: S+++E	

PARCEL VALUE
IN HAZARD AREA

Sum of Improvement Value	Exp. Rate**
\$6,573,932,887	100%
Count Includes: S+++E	

Sum of Content Value	Exp. Rate**
\$4,882,423,858	100%
Count Includes: S+++E	

CRITICAL INFRASTRUCTURE COUNTS
IN HAZARD AREA

Infrastructure Category	Count	Exp. Rate**	Count/Sum Includes:
Essential Facilities	4	100%	S+++E
High Potential Loss	305	100%	Sum of Transportation & Lifeline Linear Mileage
Transportation & Lifeline	271	100%	266 100%

MAP LEGEND

III	IV	V	VI	VII	VIII	IX	X
WEAK	LIGHT	MODERATE	STRONG	VERY STRONG	SEVERE	VIOLENT	EXTREME
MMI							

*Exposure summaries include strong, very strong, violent, and severe MMI classes. Hazard data source: USGS.

**Exposure Rate - Exposed summary or count as a percentage of total summary or count within jurisdiction.

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Figure 1-9: City of Benicia – Concord Green Valley Earthquake Scenario (M6.8)



Table 1-9: City of Benicia – Concord Green Valley Damage Estimate Summaries

Building Type	Average of Potential Damage to Exceed "Slight"	Average of Potential Damage to Exceed "Moderate"	Average of Potential Damage to Exceed "Extensive"	Average Economic Loss for Each Building Category	Sum of Economic Loss	Proportion of Loss (%)
Agriculture	0%	0%	0%	\$0	\$0	0%
Commercial	52%	23%	8%	\$1,487,686	\$364,483,142	38%
Education*	75%	58%	39%	\$2,892,590	\$5,785,180	1%
Emergency	42%	23%	8%	\$236,206	\$1,181,030	0%
Government	48%	25%	9%	\$235,778	\$16,975,983	2%
Industrial	78%	51%	17%	\$1,177,698	\$297,957,566	31%
Religion	41%	11%	1%	\$77,581	\$1,629,204	0%
Residential	38%	7%	1%	\$29,187	\$262,452,956	28%
Total					\$950,465,061	

*School district asset information not available during time of Hazus analysis.

Note: Total Inventory Values

1 - Building Replacement Costs = \$3,773,922,295

2 - Content Replacement Costs = \$2,667,166,517

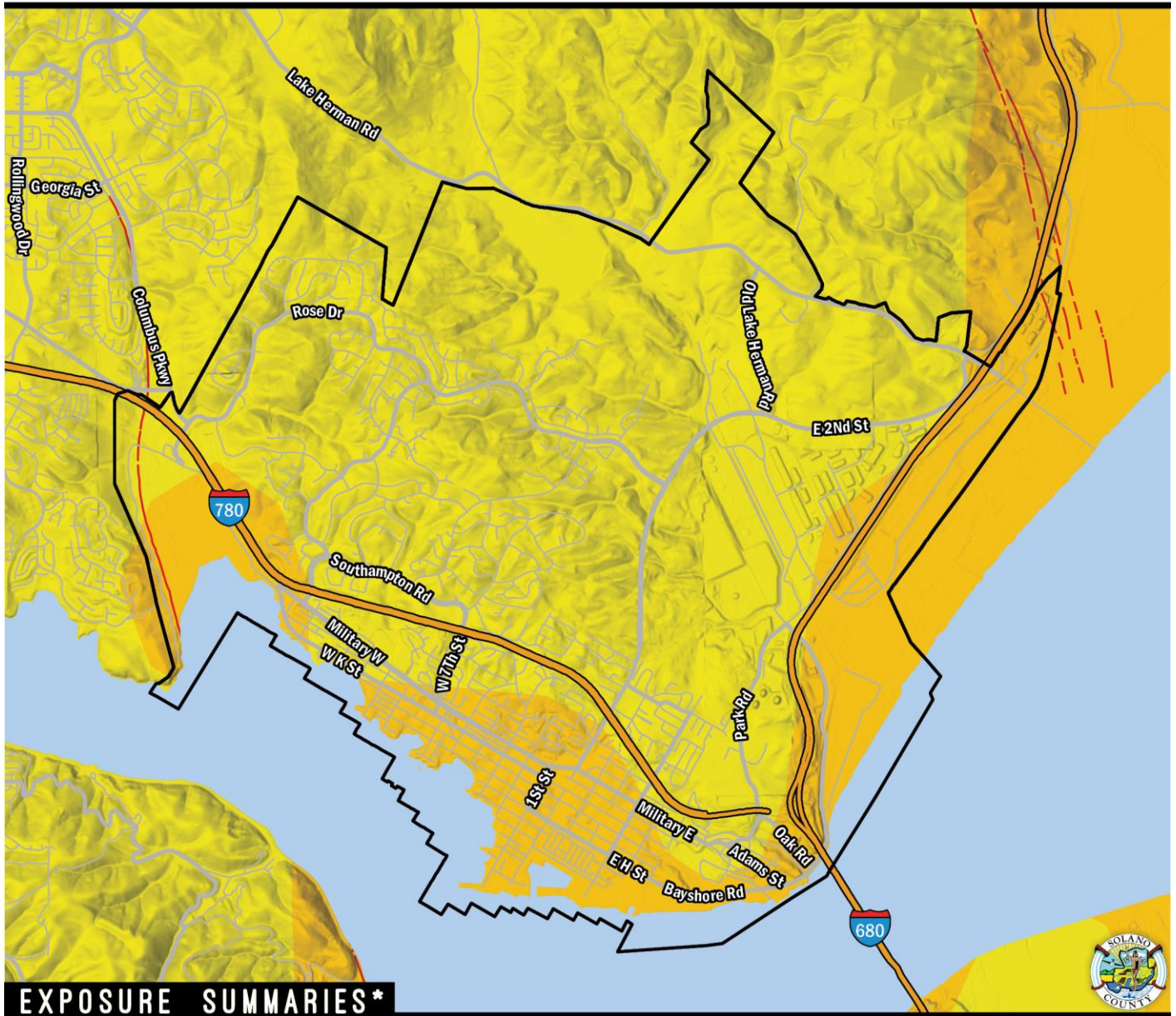
3 - Total Value = \$6,441,088,812





HAYWARD-RODGER'S CREEK EARTHQUAKE SCENARIO (M7.1)

BENICIA



EXPOSURE SUMMARIES*

POPULATION COUNT IN HAZARD AREA

Count	Exp. Rate**
28,088	100%
Count Includes: S+++E	

PARCEL COUNT IN HAZARD AREA

Count	Exp. Rate**
9,517	100%
Count Includes: S+++E	

PARCEL VALUE IN HAZARD AREA

Sum of Improvement Value	Exp. Rate**
\$6,573,932,887	100%
Count Includes: S+++E	

Sum of Content Value	Exp. Rate**
\$4,882,423,858	100%
Count Includes: S+++E	

CRITICAL INFRASTRUCTURE COUNTS IN HAZARD AREA

Infrastructure Category	Count	Exp. Rate**	Count/Sum Includes:
Essential Facilities	4	100%	S+++E
High Potential Loss	305	100%	Sum of Transportation & Lifeline Linear Mileage
Transportation & Lifeline	271	100%	266 100%

MAP LEGEND

III	IV	V	VI	VII	VIII	IX	X
WEAK	LIGHT	MODERATE	STRONG	VERY STRONG	SEVERE	VIOLENT	EXTREME
MMI							

*Exposure summaries include strong, very strong, violent, and severe MMI classes. Hazard data source: USGS.

**Exposure Rate - Exposed summary or count as a percentage of total summary or count within jurisdiction.

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Figure 1-10: City of Benicia – Hayward Rodger's Creek Earthquake Scenario (M7.1)



Table 1-10: City of Benicia – Hayward Rodgers Creek Damage Estimate Summaries

Building Type	Average of Potential Damage to Exceed "Slight"	Average of Potential Damage to Exceed "Moderate"	Average of Potential Damage to Exceed "Extensive"	Average Economic Loss for Each Building Category	Sum of Economic Loss	Proportion of Loss (%)
Agriculture	0%	0%	0%	\$0	\$0	0%
Commercial	23%	7%	1%	\$427,689	\$104,783,712	41%
Education*	42%	22%	5%	\$776,246	\$1,552,493	1%
Emergency	16%	7%	1%	\$71,121	\$355,605	0%
Government	18%	6%	1%	\$52,298	\$3,765,431	1%
Industrial	31%	12%	2%	\$289,033	\$73,125,229	29%
Religion	13%	2%	0%	\$13,996	\$293,908	0%
Residential	13%	1%	0%	\$7,898	\$71,018,687	28%
Total					\$254,895,066	

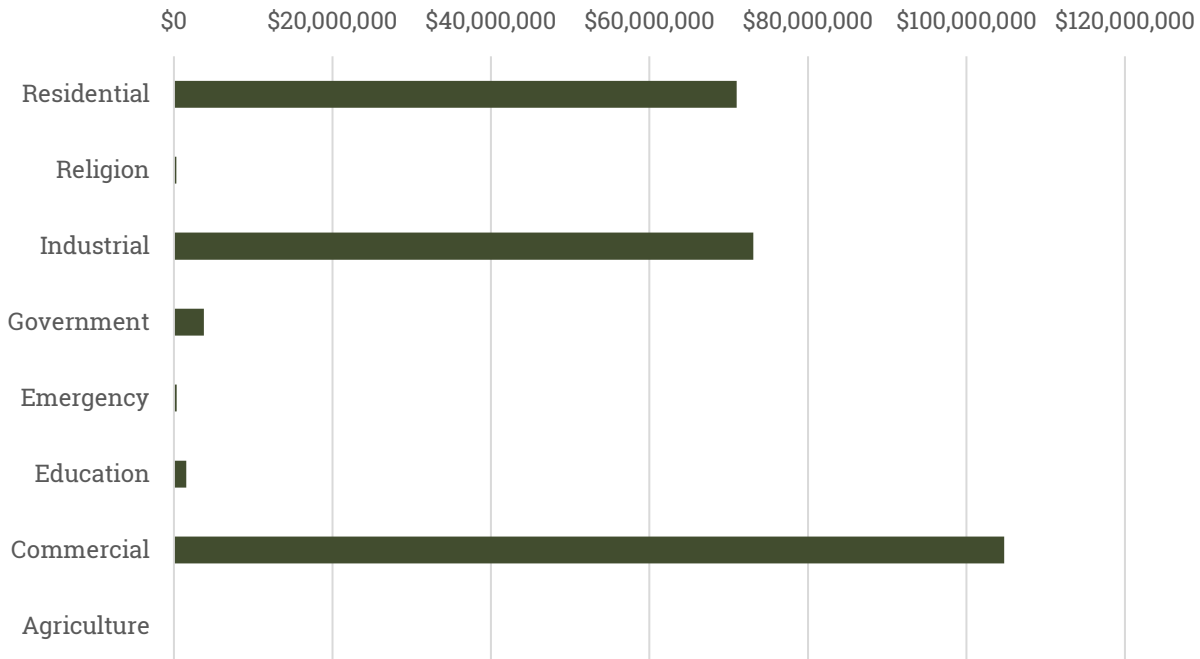
*School district asset information not available during time of Hazus analysis.

Note: Total Inventory Values

1 - Building Replacement Costs = \$3,773,922,295

2 - Content Replacement Costs = \$2,667,166,517

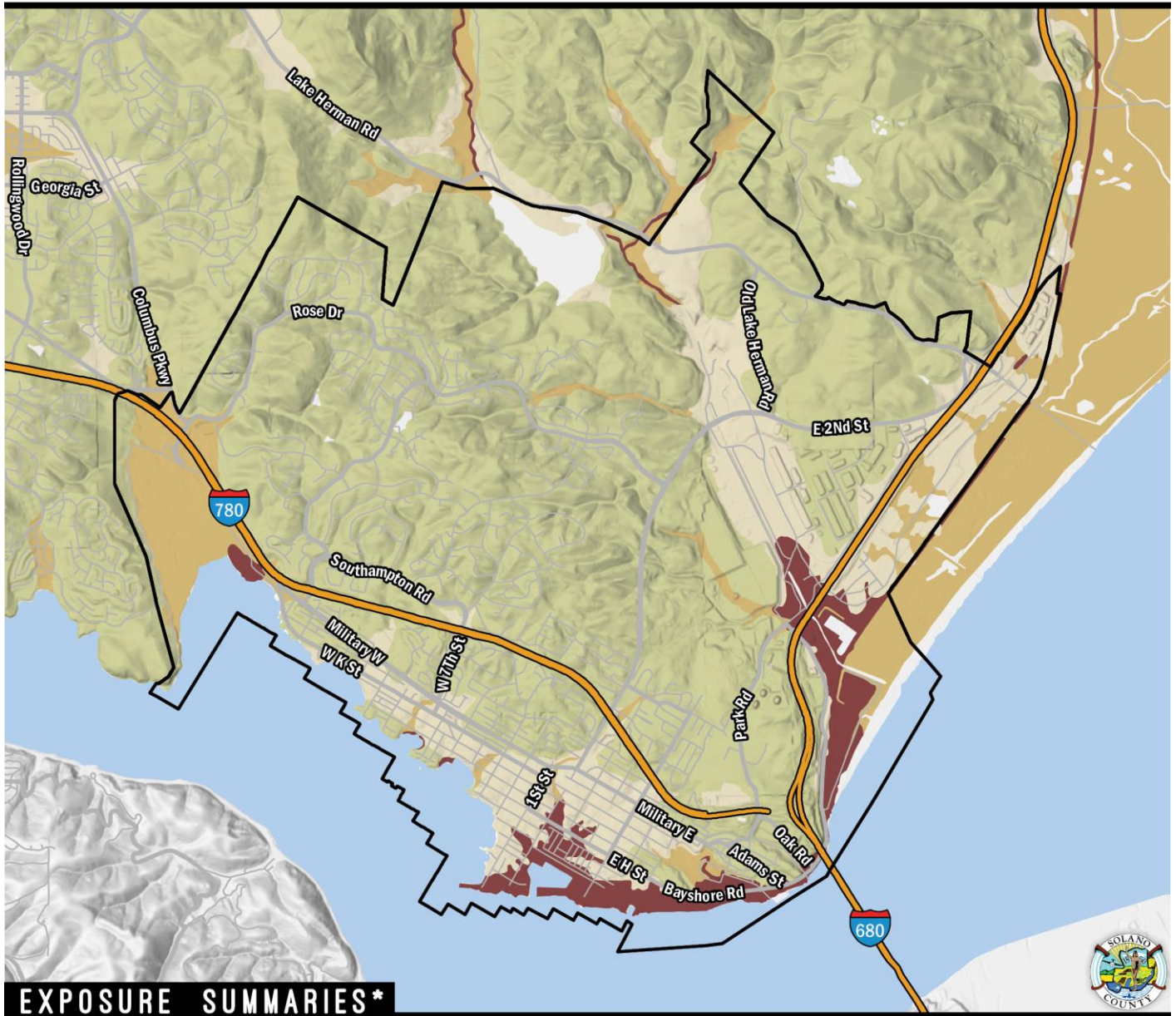
3 - Total Value = \$6,441,088,812





AREAS WITH POTENTIAL FOR LIQUEFACTION

BENICIA



EXPOSURE SUMMARIES*

POPULATION COUNT IN HAZARD AREA

Count	Exp. Rate**
3,092	11%
Count Includes:	M H VH

PARCEL COUNT IN HAZARD AREA

Count	Exp. Rate**
364	4%
Count Includes:	M H VH

PARCEL VALUE IN HAZARD AREA

Sum of Improvement Value	Exp. Rate**
\$453,000,959	7%
Sum of Content Value	Exp. Rate**
\$454,530,635	9%
Count Includes:	M H VH

CRITICAL INFRASTRUCTURE COUNTS IN HAZARD AREA

Infrastructure Category	Count	Exp. Rate**	Count/Sum Includes:
Essential Facilities	0	0%	M H VH
High Potential Loss	57	19%	Sum of Transportation & Lifeline Linear Mileage
Transportation & Lifeline	23	8%	38 14%

MAP LEGEND

VL	L	M	H	VH
VERY LIGHT	LIGHT	MODERATE	HIGH	VERY HIGH

*Exposure summaries include medium, high, very high susceptibility. Hazard data source: USGS.

**Exposure Rate - Exposed summary or count as a percentage of total summary or count within jurisdiction.

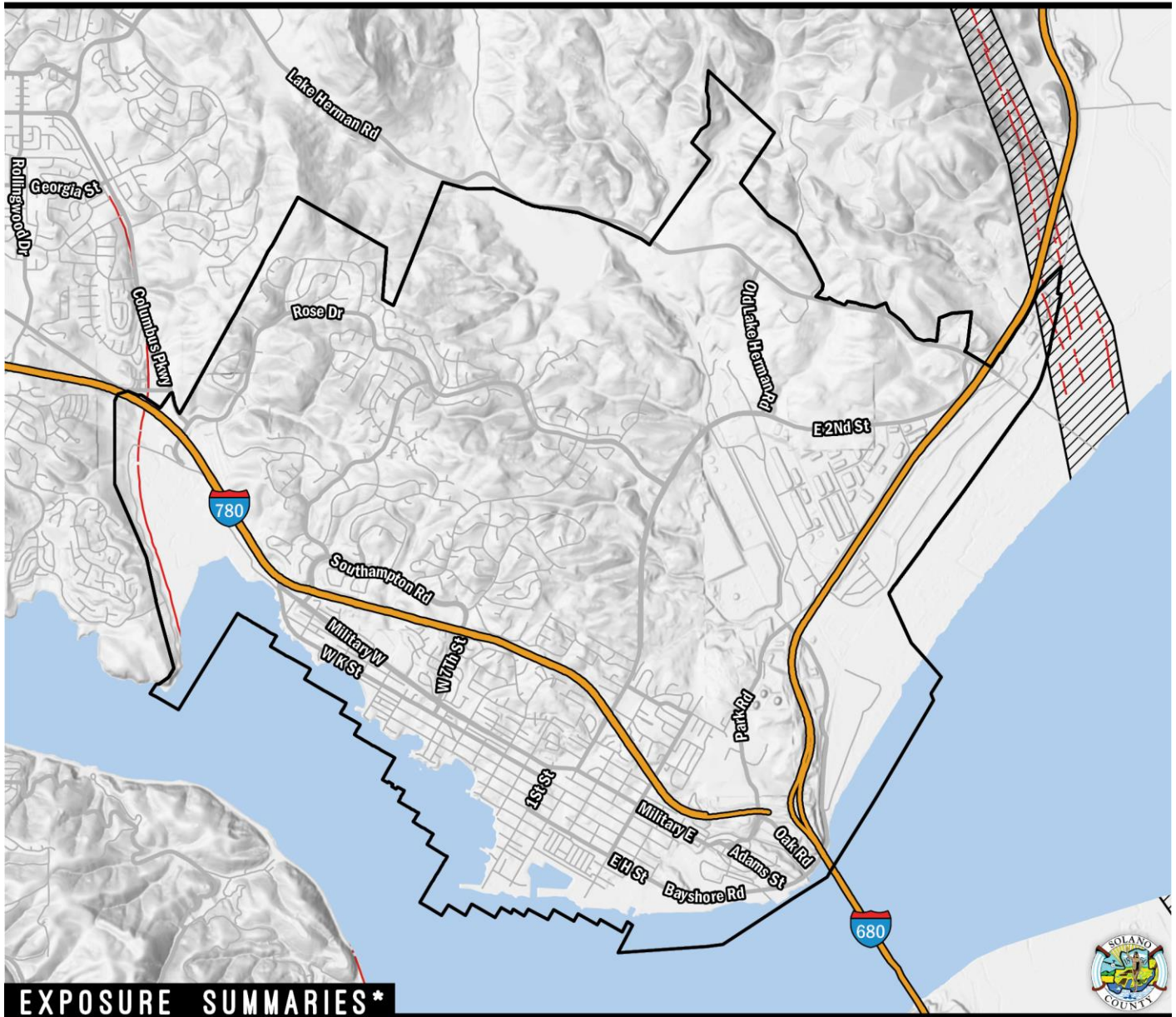
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Figure 1-11: City of Benicia – Areas with Potential for Liquefaction



FAULT ZONE AREAS OF REQUIRED INVESTIGATION

BENICIA



EXPOSURE SUMMARIES*

POPULATION COUNT IN HAZARD AREA	
Count	Exp. Rate**
10	0%
Count Includes:	

PARCEL COUNT IN HAZARD AREA	
Count	Exp. Rate**
2	0%
Count Includes:	

PARCEL VALUE IN HAZARD AREA	
Sum of Improvement Value	Exp. Rate**
\$42,246,754	1%
Sum of Content Value	
\$63,370,129	1%
Count Includes:	

CRITICAL INFRASTRUCTURE COUNTS IN HAZARD AREA			
Infrastructure Category	Count	Exp. Rate**	Count/Sum Includes:
Essential Facilities	0	0%	
High Potential Loss	0	0%	<i>Sum of Transportation & Lifeline Linear Mileage</i>
Transportation & Lifeline	0	0%	0 0%

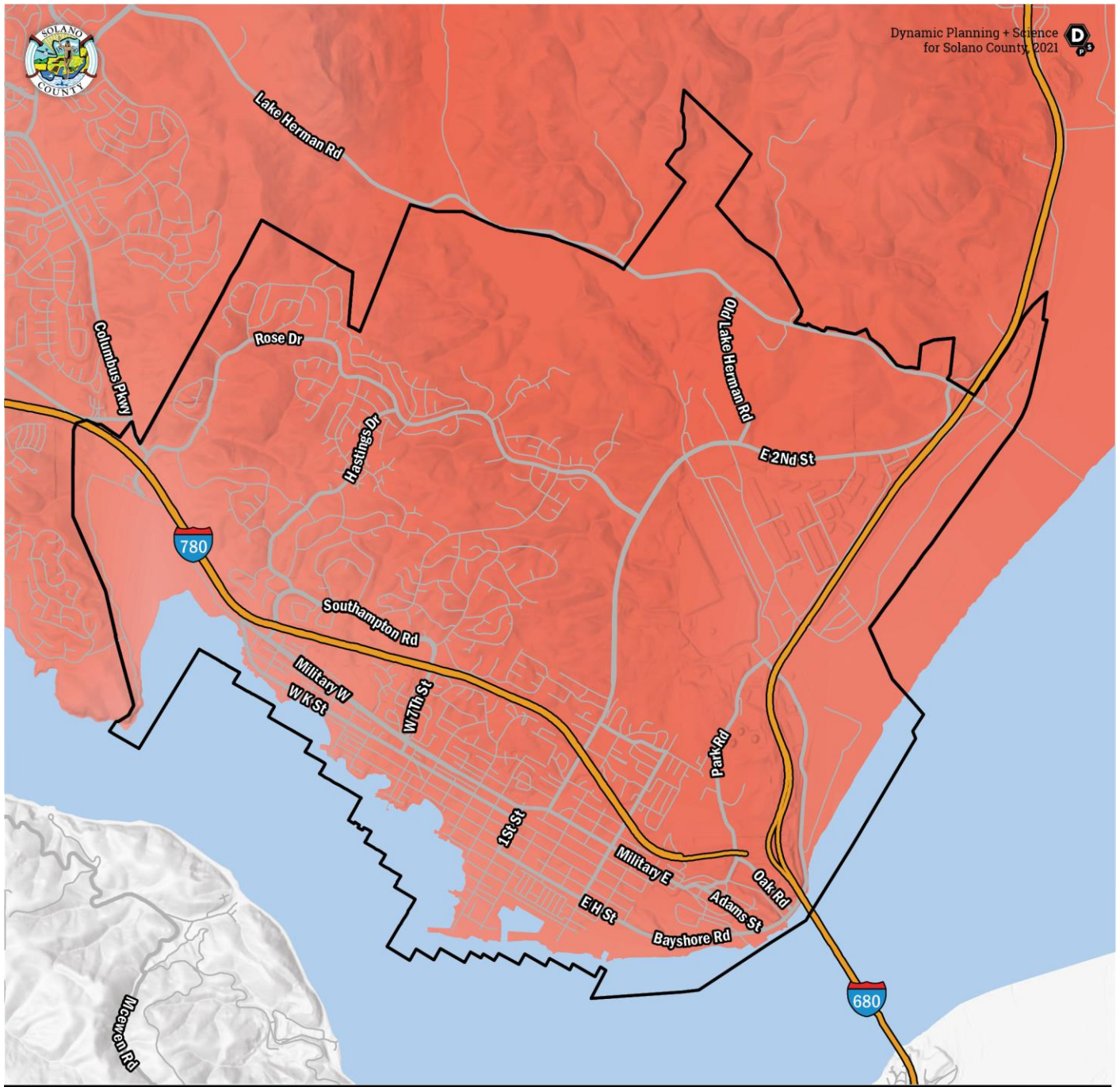
- MAP LEGEND**
- QUATERNARY FAULTS (USGS)
 - EARTHQUAKE FAULT ZONE OF REQUIRED INVESTIGATION (CGS)

*Exposure summaries include within zone of investigation. Hazard data source: CGS.
 **Exposure Rate - Exposed summary or count as a percentage of total summary or count within jurisdiction.
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Figure 1-12: City of Benicia – Fault Zone Areas of Required Investigation



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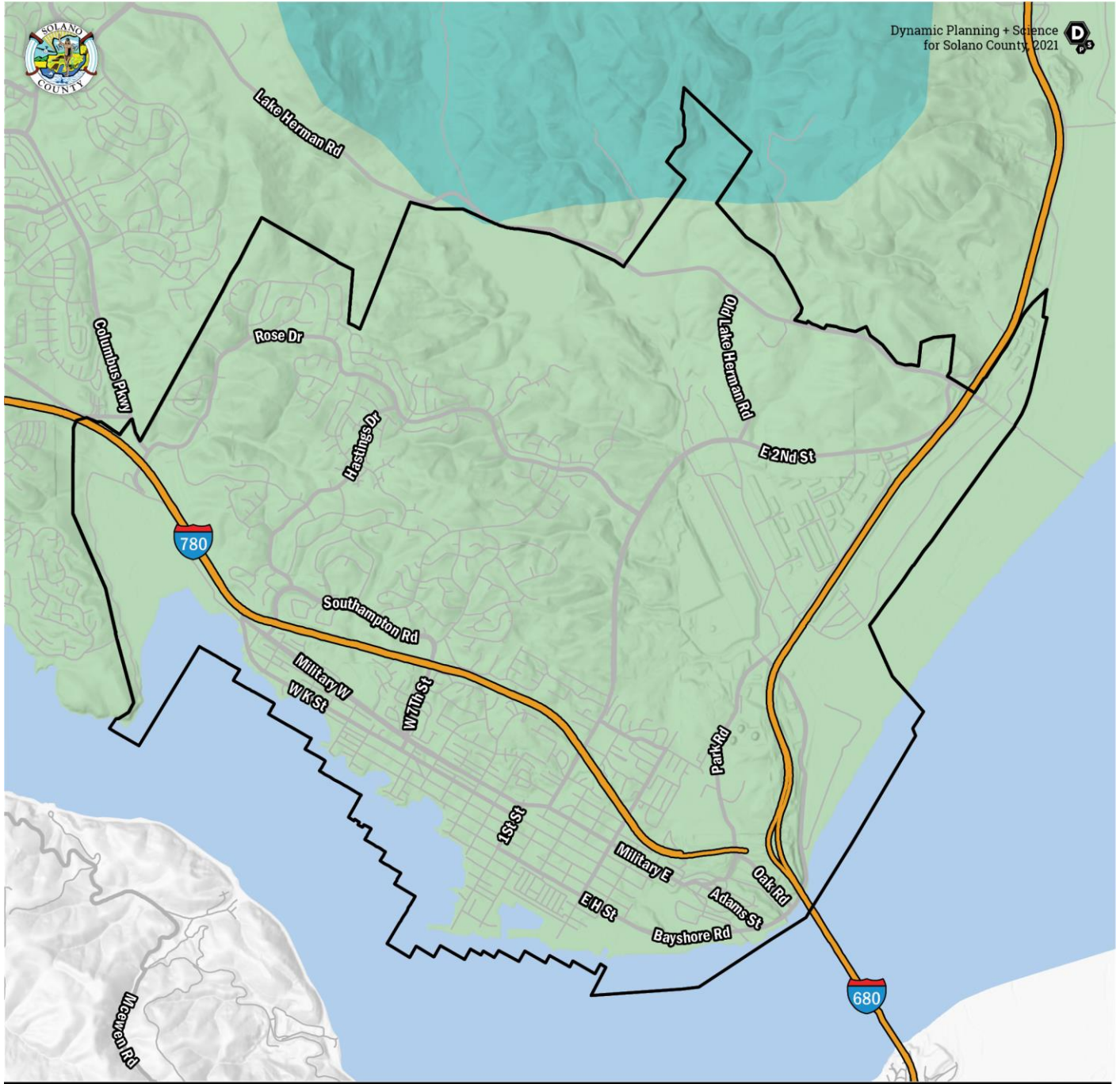


30-YR NORMAL MAXIMUM TEMPERATURE FOR JULY BENICIA

*Data sources: PRISM 800m Resolution 30-YR Normals.



Figure 1-13: City of Benicia – 30-YR Normal Maximum Temperature for July



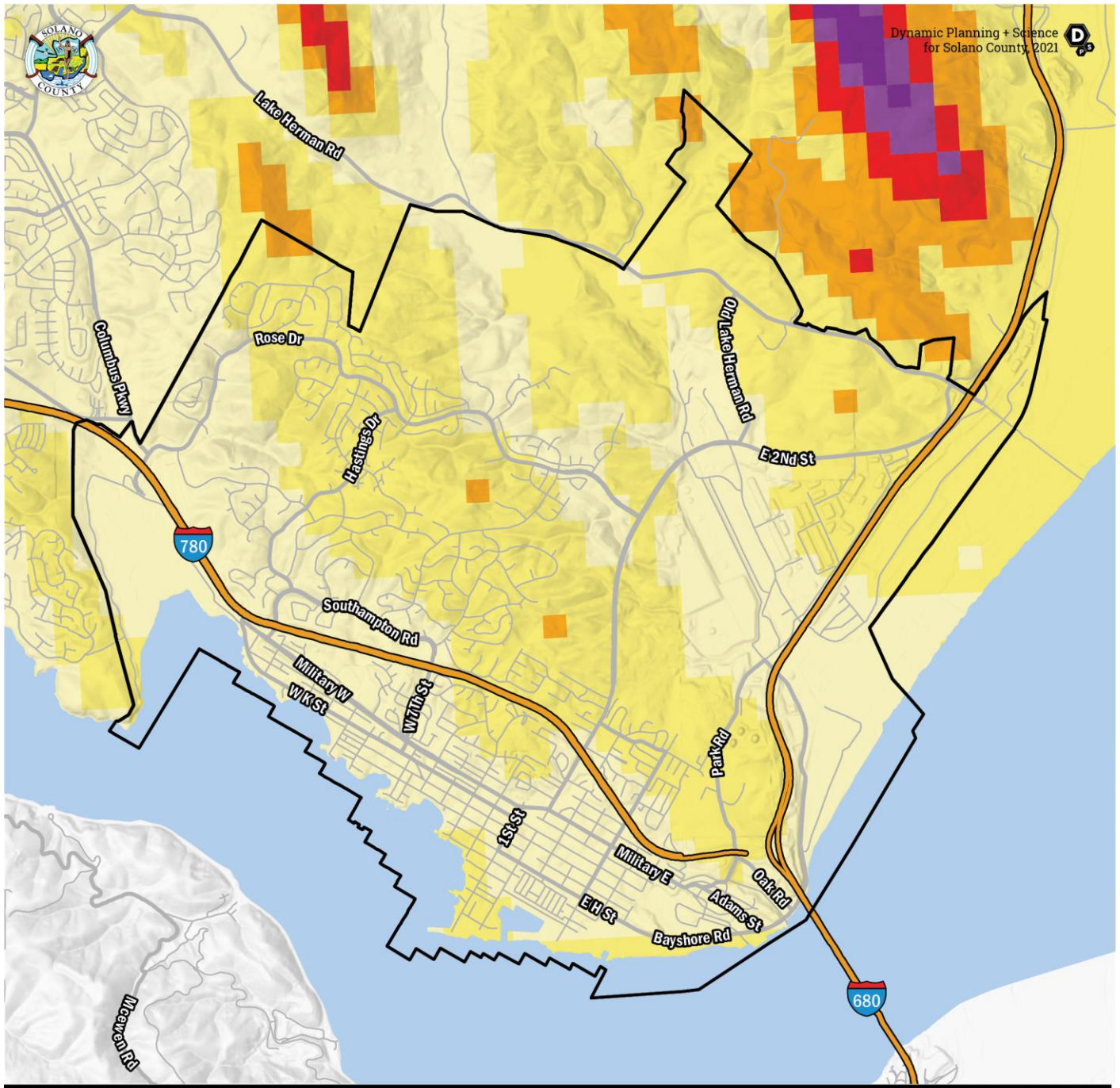
AVERAGE ANNUAL PRECIPITATION (1981-2010, INCHES)

BENICIA

*Data sources: USDA - 1981-2010 Annual Average Precipitation by State.

14	18	23	28	33
17	22	27	32	37
INCHES				

Figure 1-14: City of Benicia – Average Annual Precipitation (1981-2010)



**ANNUAL AVERAGE WIND SPEED (POWER CLASS)
BENICIA**

*Data sources: NREL.



Figure 1-15: City of Benicia – Annual Average Wind Speed (Power Class)



Table 1-11: Drought Classifications and Impacts

Category	Description	Possible Impacts
D0	Abnormally Dry	<ul style="list-style-type: none"> Active fire season begins Going into drought, short term dryness, slowing planting, growth of crops or pastures. Coming out of drought, some lingering water deficits and pasture or crops not fully recovered,
D1	Moderate Drought	<ul style="list-style-type: none"> Some damage to crops, pastures Streams, reservoirs, or wells low, some water shortages developing or imminent Voluntary water-use restrictions requested
D2	Severe Drought	<ul style="list-style-type: none"> Crop or pasture losses likely Water shortages common Water restrictions imposed
D3	Extreme Drought	<ul style="list-style-type: none"> Major crop/ pasture losses Widespread water shortages or restrictions
D4	Exceptional Drought	<ul style="list-style-type: none"> Exceptional and widespread crop/ pasture losses Shortages of water in reservoirs, streams, and wells creating water

Adapted from U.S. Drought Monitor Drought Classifications and Impacts

Drought Severity Timeline

Suisun Bay

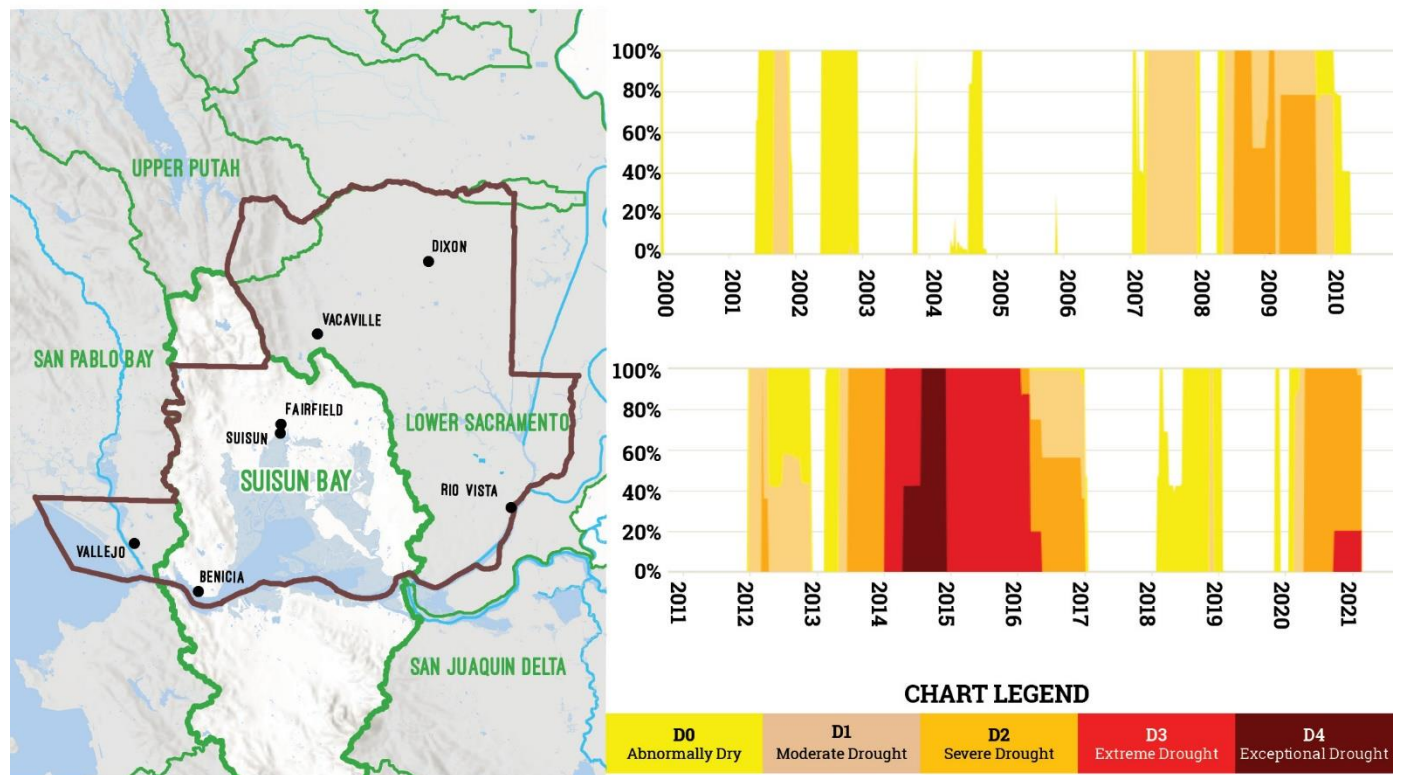


Figure 1-16: City of Benicia–Drought Severity Timeline – Suisun Bay



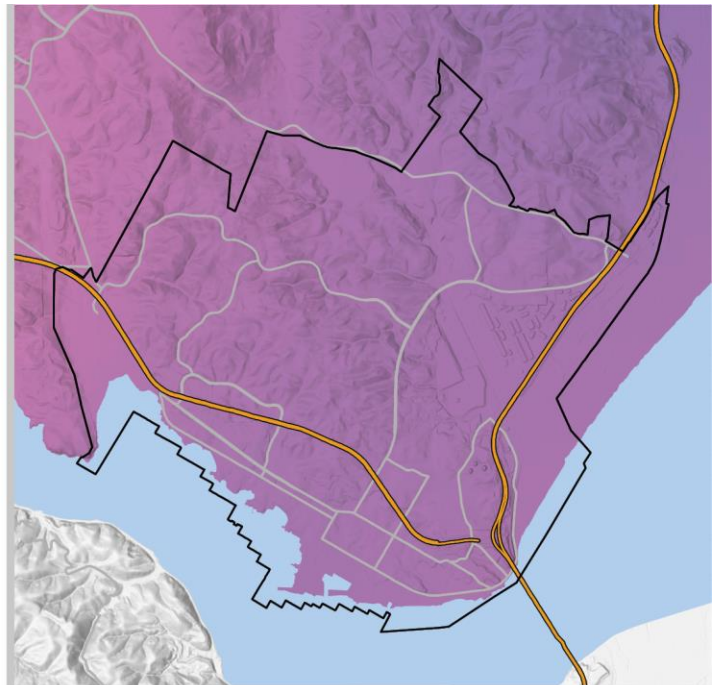
BENICIA

AVERAGE ANNUAL MAXIMUM TEMPERATURE

COMPARISON OF CURRENT OBSERVED TO RCP 4.5 AND RCP 8.5 SCENARIOS



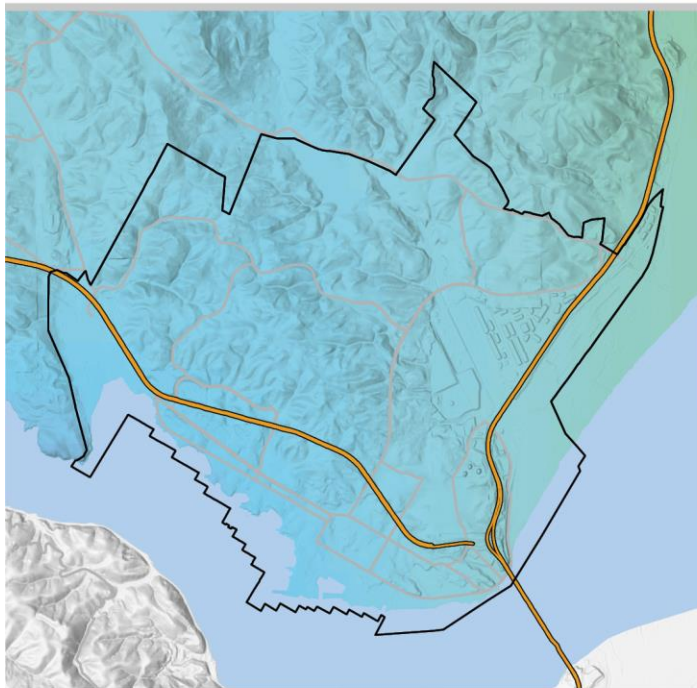
*Data sources: Cal-Adapt CanESM2 RCP 4.5 & 8.5, PRISM 30-YR Norms Annual Max Temp



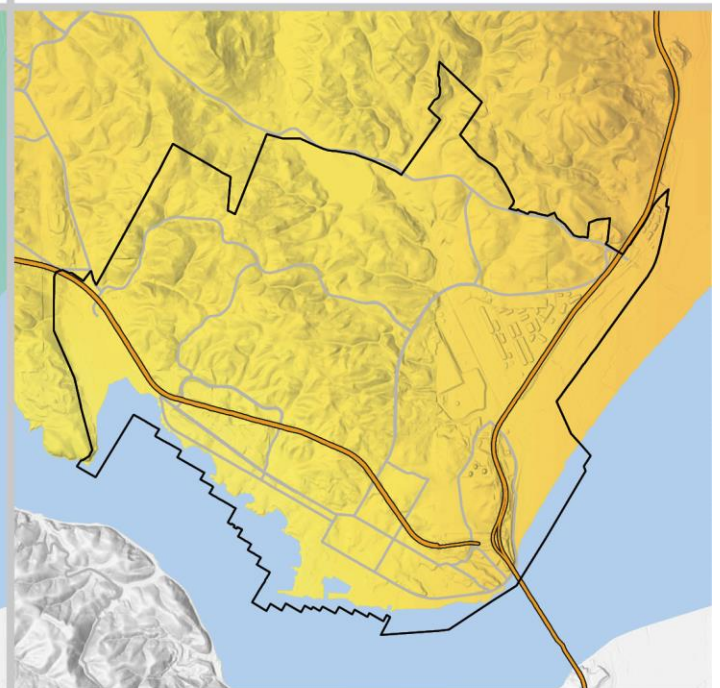
CURRENT 30-YR NORMAL



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RCP 4.5 YEAR 2100



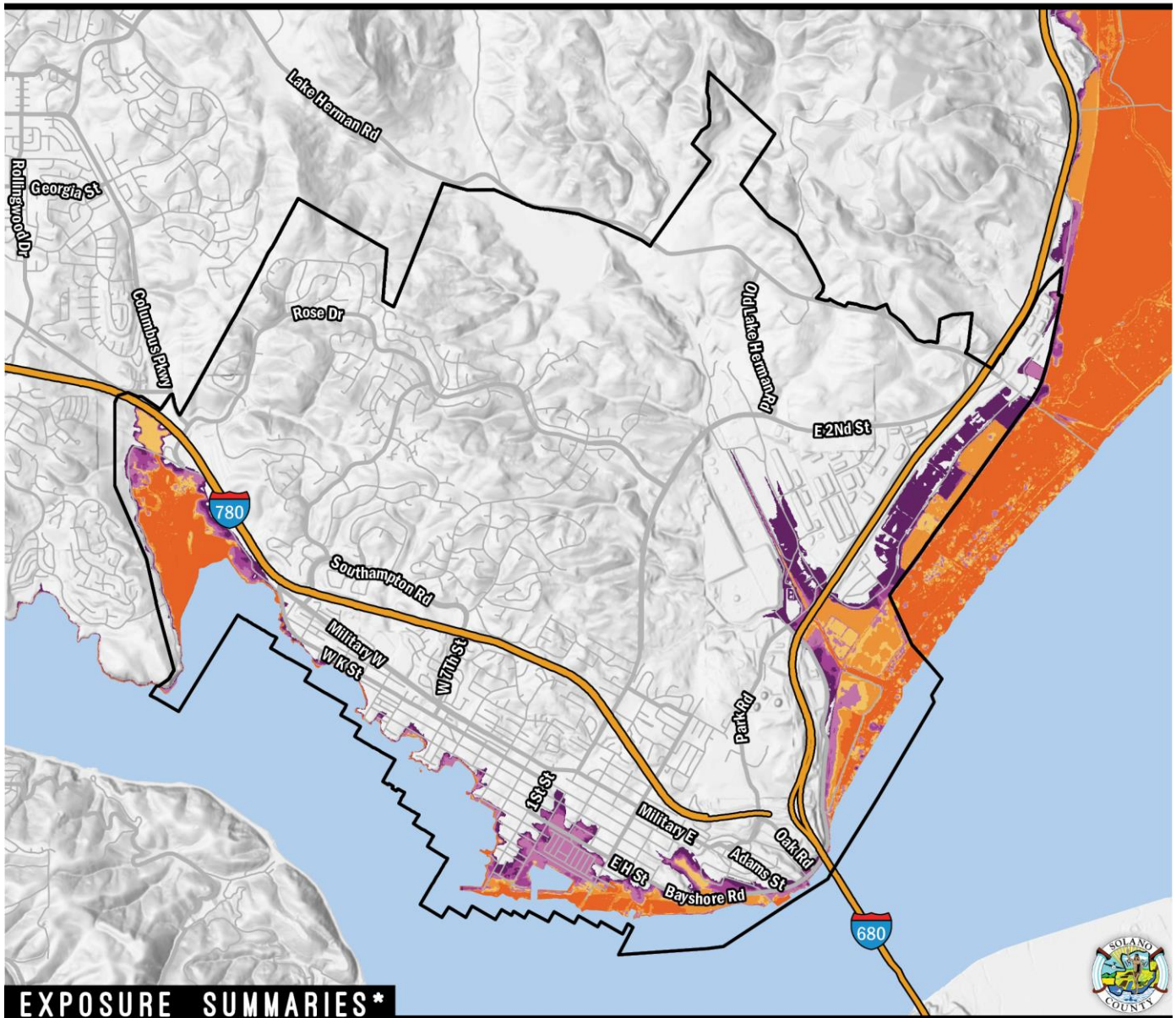
RCP 8.5 YEAR 2100

Figure 1-17: City of Benicia – RCP Comparison



SEA LEVEL RISE EXPOSURE

BENICIA



EXPOSURE SUMMARIES*

POPULATION COUNT IN HAZARD AREA		PARCEL COUNT IN HAZARD AREA		PARCEL VALUE IN HAZARD AREA		CRITICAL INFRASTRUCTURE COUNTS IN HAZARD AREA			
Count	Exp. Rate**	Count	Exp. Rate**	Sum of Improvement Value	Exp. Rate**	Infrastructure Category	Count	Exp. Rate**	Count/Sum Includes:
2,862	10%	443	5%	\$718,611,721	11%	Essential Facilities	0	0%	L+++E
Count Includes: L+++E		Count Includes: L+++E		Sum of Content Value		High Potential Loss	73	24%	Sum of Transportation & Lifeline Linear Mileage
				\$752,579,803	15%	Transportation & Lifeline	23	8%	
				Count Includes: L+++E					

MAP LEGEND

AMOUNT OF RISE

EXTREME (2.5M)	INTERMEDIATE (1.0M)
HIGH (2.0M)	INTERMEDIATE LOW (0.5M)
INTERMEDIATE HIGH (1.5)	LOW (0.3M)

*Exposure summaries include scenarios low rise to extreme rise. Hazard data source: NOAA.
 **Exposure Rate - Exposed summary or count as a percentage of total summary or count within jurisdiction.

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Figure 1-18: City of Benicia – Sea Level Rise Snapshot



1.4.3.3 Past and Future Development

The City of Benicia is a general law city that crafts its own development regulations and is subject to State law. Future development is subject to compliance with state and local planning, zoning, subdivision, and architecture laws.

The City of Benicia's General Plan (GP) establishes long-range development policies. The GP is designed to help the City address issues related to land use, circulation (traffic), housing, open space, conservation, noise, and safety. The Land Use portion of the plan helps guide the City in determining the location of future development(s), including possible future annexation. In addition to the GP, the City has other plans that guide development in specific areas, including specific plans, policy plans, and master plans. These plans help to shape future development and dictate the City's Sphere of Influence (SOI). One of the central functions in these planning documents is to decrease risk of impact from natural hazards.

Development since Previous HMP

The City considered its growth since the last HMP and determined it had completed a central mitigation action and substantially decreased its vulnerability to hazards. The City updated its Building Code in January of 2020. This HMP Annex has been revised to reflect this substantial change in past development and continues to focus on avenues to better mitigate impacts from problematic past development.

Future Development

City of Benicia is required to update building codes to meet the minimum standards to those required in the California Building Code last updated in 2019. California Building Codes provide some of the safest construction standards in the world and are meant to reduce risk to occupants from high wind, seismic activity, landslides, flood, wildfire, and other natural hazards. In addition to California minimum development standards, all jurisdictions belong to the NFIP, and all development must meet minimum flood protection standards set forth by FEMA. See Section 4.3.5 of Volume 1 for more information about past and future development in Solano County.

As the General Plan is updated and incorporates information from this HMP, City of Benicia staff are continually improving hazard information through these hazard mitigation plan updates. With this 2020 update, improved online mapping about natural hazards available on RAMP will inform those responsible for future development to make better decisions where and how future development occurs.

City of Benicia reviewed its general plans under the capability assessments undertaken for this hazard mitigation plan. See Section 1.5.1. Deficiencies revealed by these reviews are identified as mitigation actions to decrease risks to move beyond past trends.



The City's municipal codes includes regulations to mitigate the impact of hazards on new and existing development, including:

- Drainage and stormwater retention requirements,
- Steep slope restrictions for new development,
- Waterbody buffer requirements,
- Floodplain management regulations,
- Zoning that prevents development in hazardous areas of the community such as floodplains, landslide areas, the wildland-urban interface (WUI), or other known hazard areas, and
- Building codes that include the most up-to-date California Fire Code, seismic standards, and many other provisions crafted to protect new construction from hazard events.

Even in the event that limited development did occur within a hazard area, the municipal code should ensure impacts from a hazard event are mitigated and losses are minimal. If development does occur in hazard areas, evacuation and emergency planning should take into consideration the anticipated local impacts of the hazard event, including potential interrupted services or the elimination of access.

The anticipated growth in the City will not cause significant change in vulnerability to the City for identified priority hazards.

National Flood Insurance Program (NFIP)

The NFIP makes federally backed flood insurance available to homeowners, renters, and business owners in participating communities. FEMA has prepared a detailed Flood Insurance Study (FIS) for Solano County and municipalities. The study presents water surface elevations for floods of various magnitudes, including the 1-percent annual chance flood and the 0.2-percent annual chance flood (the 500-YR flood). Base flood elevations and the boundaries of the 100- and 500-YR floodplains are shown on Flood Insurance Rate Maps (FIRMs), which are the principal tools for identifying the extent and location of the flood hazard. FIRMs are the most detailed and consistent data source available, and for many communities they represent the minimum area of oversight under their floodplain management program. See Section 4 of Volume 1 for general information on the NFIP.

The City of Benicia has participated in the NFIP since 1977. The City of Benicia is currently in good standing with the provisions of the NFIP. Compliance is monitored by FEMA regional staff and by the California Department of Water Resources under a contract with FEMA. Maintaining compliance under the NFIP is an important component of flood risk reduction. See Table 1-12 for more information on the City's policies and historic flood insurance claims.



Table 1-12: NFIP Status Table

NFIP and CRS Status & Information	
City of Benicia	
NFIP Status	05/31/77
CRS Class	-
Policies in Force	101
Policies in SFHA	22
Policies in non-SFHA	79
Total Claims Paid	\$619,156
Paid Losses	7
Repetitive Loss Properties	1
Severe Repetitive Loss Properties	-
Repetitive Loss Payment by NFIP on Building	\$395,030
Repetitive Loss Payment by NFIP on Contents	\$176,206

Source: FEMA CIS 2021, OpenFEMA Data, FIMA RUL Solano County

Note: Policies and claims provided directly from FEMA Region IX CIS Report (8/2021). Repetitive loss tabulations by jurisdiction derived via GIS-based intersect of data available at OpenFEMA Data (<https://www.fema.gov/about/openfema/data-sets>). Countywide data reported for entire county area including municipalities. The Privacy Act of 1974 (5 U.S.C. 522a) restricts the release of certain types of data to the public. Flood insurance policy and claims data are included in the list of restricted information. FEMA can only release such data to state and local governments, and only if the data are used for floodplain management, mitigation, or research purposes. Therefore, this plan does not identify the repetitive loss properties or include claims data for any individual property.

See Volume 1, Section 4.5 for more information on the NFIP

1.4.3.4 Identify Hazard Problem Statements

As part of the mitigation action identification process, the Planning Committee for each jurisdiction identified areas of concern (aka problem statements) for their respective facilities based on the risk assessment and vulnerability analysis, utilizing the RAMP mapping and static snapshot maps. Problem statements focused on the impact, victim, or threat that the hazard could create in the jurisdiction, as described in Figure 1-19. Identifying common issues and weaknesses through these problem statements assisted the Planning Committee in understanding the realm of resources needed for mitigation. Jurisdiction problem statements are listed in Table 1-13.

The goal is to have at least one mitigation action for every problem statement. Projects or actions have been developed to mitigate each problem identified. See Table 1-18 for a full list of mitigation actions and corresponding problem statements that they address. Each problem statement is coded with a problem number for cross-referencing between Table 1-13 and Table 1-18.

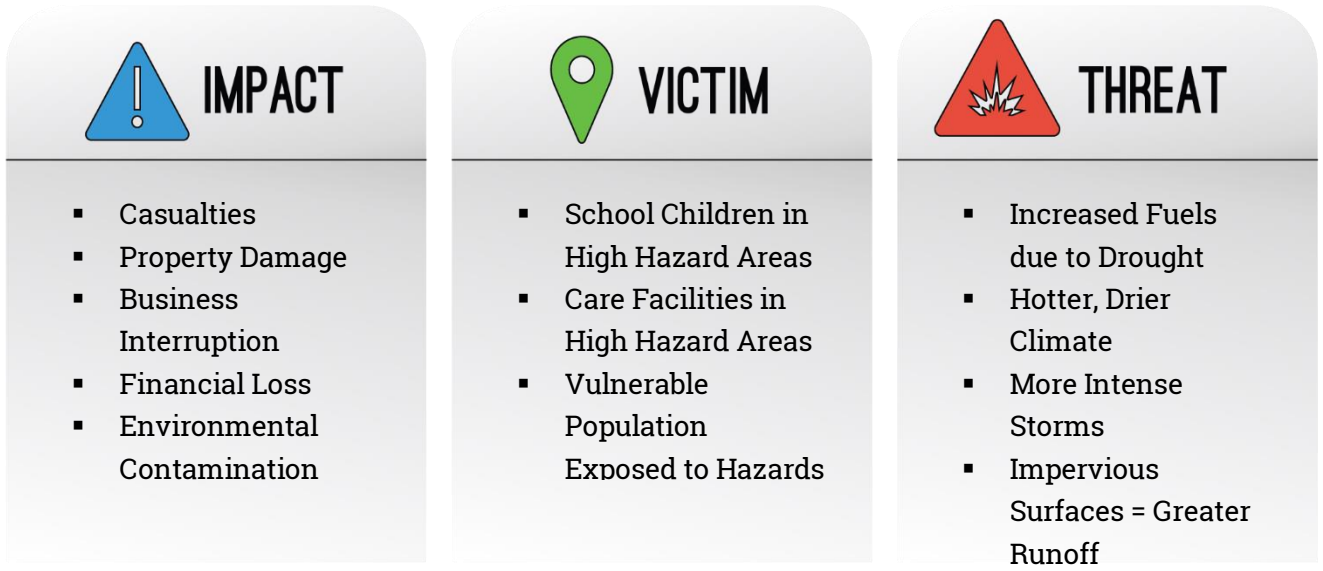


Figure 1-19: Guidance for Problem Statements

Table 1-13: Problem Statements

Problem No.	Hazard Type	Area of Concern	Mitigation Alternatives	Primary Agency	Problem Description	Related MA
ps-AH-BN-15	All Hazard	Impact	ES - Emergency Services	City of Benicia	The Clock Tower is a designated Red Cross Shelter that lacks a backup generator.	ma-AH-BN-65
ps-AH-BN-16	All Hazard	Impact	ES - Emergency Services	City of Benicia	6 out of the 7 backup generators the City has are used and may need to be replaced.	ma-AH-BN-66, ma-AH-BN-65
ps-EQ-BN-17	Earthquake	Impact	PE&A - Public Education & Awareness , ES - Emergency Services , SP - Structural Projects	City of Benicia	Earthquakes can cause major damage to the jurisdiction causing liquefaction throughout the city.	ma-EQ-BN-68, ma-AH-BN-86
ps-EQ-BN-18	Earthquake	Impact	PPRO - Property Protection , PE&A - Public Education & Awareness , SP - Structural Projects	City of Benicia	Many buildings throughout the City are of older tilt up construction, making them particularly vulnerable to the impacts of an earthquake.	ma-EQ-BN-68, ma-EQ-BN-89, ma-AH-BN-85, ma-EQ-BN-83
ps-EQ-BN-19	Earthquake	Impact	SP - Structural Projects	City of Benicia	The City's Clocktower is constructed of sandstone masonry making it vulnerable to an earthquake.	ma-EQ-BN-68, ma-EQ-BN-89
ps-EQ-BN-20	Earthquake	Impact	ES - Emergency Services , SP - Structural Projects	City of Benicia	Benicia has several petroleum transmission (PGE) lines running through the jurisdiction, mostly natural gas, which presents the potential for gas leaks throughout the town.	ma-EQ-BN-87



Problem No.	Hazard Type	Area of Concern	Mitigation Alternatives	Primary Agency	Problem Description	Related MA
ps-EQ-BN-21	Earthquake	Impact	SP - Structural Projects	City of Benicia	The City's Wastewater Treatment Plant is located in a severe shake zone for the M6.8 Concord Green Valley EQ scenario.	ma-EQ-BN-68, ma-EQ-BN-70, ma-EQ-BN-89
ps-EQ-BN-22	Earthquake	Victim	PE&A - Public Education & Awareness , ES - Emergency Services , SP - Structural Projects	City of Benicia	The entire population of Benicia is located in a strong or very strong shake zone for the M6.8 Concord Green Valley EQ scenario.	ma-EQ-BN-68, ma-EQ-BN-71, ma-EQ-BN-89, ma-AH-BN-82, ma-AH-BN-98
ps-EQ-BN-24	Earthquake	Impact	PRV - Prevention , PPRO - Property Protection	City of Benicia	The City is in need of a list of single-family homes with cripple wall foundations to make the State standard approved plan set available to those structures.	ma-AH-BN-86
ps-EQ-BN-25	Earthquake	Impact	PRV - Prevention , PPRO - Property Protection	City of Benicia	The City needs an inventory list of structures with soft story construction.	ma-AH-BN-86
ps-EQ-BN-26	Earthquake	Impact	PRV - Prevention , PPRO - Property Protection	City of Benicia	The City needs an inventory list of buildings throughout the City with tilt up construction.	ma-AH-BN-86
ps-EQ-BN-27	Earthquake	Impact	PRV - Prevention , PE&A - Public Education & Awareness	City of Benicia	The City currently does not have a seismic gas shut-off valve ordinance or program.	ma-EQ-BN-87
ps-EQ-BN-28	Earthquake	Impact	PPRO - Property Protection , SP - Structural Projects	City of Benicia	City owned facilities may lack seismic gas shut-off valves.	ma-EQ-BN-69, ma-EQ-BN-87
ps-EQ-BN-29	Earthquake	Impact	SP - Structural Projects	City of Benicia	City Hall Chambers is in need of seismic retrofits	ma-EQ-BN-68
ps-EQ-BN-31	Earthquake	Impact	SP - Structural Projects	City of Benicia	The City Pool is twelve feet deep (below sea level) and is routinely impacted by liquefaction from small earthquakes.	ma-EQ-BN-68
ps-EQ-BN-32	Earthquake	Impact	SP - Structural Projects	City of Benicia	The Camel Barn Museum Complex is in need of seismic retrofitting.	ma-EQ-BN-68
ps-FL-BN-33	Flood	Impact	SP - Structural Projects	City of Benicia	The City's wastewater treatment facility is located in the 100-year flood zone.	ma-FL-BN-80, ma-FL-BN-95, ma-FL-BN-147
ps-FL-BN-34	Flood	Impact	SP - Structural Projects	City of Benicia	3 City Bridges are located in the 100-year flood zone.	ma-FL-BN-95, ma-FL-BN-88
ps-FL-BN-35	Flood	Impact	SP - Structural Projects	City of Benicia	Portions of the Vallero Benicia Refinery are located in the 100-year flood zone.	ma-FL-BN-80, ma-FL-BN-95
ps-FL-BN-36	Flood	Impact	SP - Structural Projects	City of Benicia	Some City streets were built on lightweight fill where flooding warps the streets and threatens damage to underground utilities.	ma-FL-BN-95
ps-FL-BN-37	Flood	Impact	SP - Structural Projects	City of Benicia	E. Channel Road and small portions of W. Channel Road, Park Road, and Industrial Way have flooded in the past from Lake Herman overflow.	ma-FL-BN-95, ma-FL-BN-88



Problem No.	Hazard Type	Area of Concern	Mitigation Alternatives	Primary Agency	Problem Description	Related MA
ps-FL-BN-38	Flood	Impact	PPRO - Property Protection , SP - Structural Projects	City of Benicia	Sulphur Creek routinely floods. Further investigation is needed to determine mitigation.	ma-FL-BN-88
ps-FL-BN-39	Flood	Victim	PPRO - Property Protection , PE&A - Public Education & Awareness , SP - Structural Projects	City of Benicia	1401 people live in the 100-year flood zone.	ma-FL-BN-95, ma-FL-BN-88, ma-AH-BN-82
ps-FL-BN-40	Flood	Victim	PPRO - Property Protection , PE&A - Public Education & Awareness , SP - Structural Projects	City of Benicia	Rancho Benicia Mobile Home Park is an affordable senior oriented community that is located in the 100-year flood zone.	ma-FL-BN-95, ma-FL-BN-88
ps-WF-BN-41	Wildfire	Impact	PRV - Prevention , SP - Structural Projects	City of Benicia	The City's Water Treatment Plant is located in the middle of open space and at an increased risk of wildfire.	ma-WF-BN-90, ma-WF-BN-90, ma-WF-BN-114
ps-WF-BN-42	Wildfire	Impact	PRV - Prevention , PPRO - Property Protection , PE&A - Public Education & Awareness , SP - Structural Projects	City of Benicia	Almost the entire City of Benicia is located in a moderate designated wildfire risk area.	ma-AH-BN-82, ma-AH-BN-98, ma-WF-BN-114, ma-WF-BN-115
ps-WF-BN-43	Wildfire	Impact	ES - Emergency Services , SP - Structural Projects	City of Benicia	Both City Hall and the Police Department do not have fire sprinkler suppression systems.	ma-WF-BN-104
ps-WF-BN-44	Wildfire	Victim	PRV - Prevention , PPRO - Property Protection , PE&A - Public Education & Awareness , ES - Emergency Services , SP - Structural Projects	City of Benicia	Approximately 24,861 people live in a moderate or high wildfire risk area.	ma-AH-BN-98, ma-WF-BN-90, ma-WF-BN-115
ps-WF-BN-45	Wildfire	Threat	PRV - Prevention , PE&A - Public Education & Awareness , NRP - Natural Resource Protection	City of Benicia	Recreational use around Lake Herman increases the threat of wildfire (BBQ's, cigarettes).	ma-WF-BN-105, ma-WF-BN-114



Problem No.	Hazard Type	Area of Concern	Mitigation Alternatives	Primary Agency	Problem Description	Related MA
ps-WF-BN-46	Wildfire	Threat	PRV - Prevention , PPRO - Property Protection , PE&A - Public Education & Awareness , ES - Emergency Services	City of Benicia	The City has 2200 acres of open spaces, located between residential areas, which increase the risk of wildfire.	ma-WF-BN-90, ma-WF-BN-105
ps-EW-BN-47	Extreme Weather	Impact	PPRO - Property Protection , SP - Structural Projects	City of Benicia	The Industrial Park area (Bayshore and E Channel Rd.) experiences flooding from heavy rain events.	ma-FL-BN-95, ma-FL-BN-148
ps-EW-BN-48	Extreme Weather	Impact	SP - Structural Projects	City of Benicia	Heavy rain events can lead to overtopping of Lake Herman and downstream flooding.	ma-FL-BN-95, ma-AH-BN-76
ps-EW-BN-49	Extreme Weather	Impact	ES - Emergency Services	City of Benicia	Need for more generators and evacuation shelters throughout the jurisdiction for cooling centers.	ma-AH-BN-66, ma-EW-BN-96, ma-AH-BN-65
ps-EW-BN-50	Extreme Weather	Impact	PPRO - Property Protection , SP - Structural Projects	City of Benicia	W 9th St. City Pier is routinely impacted by storm events and lacks a breakwater to protect it.	ma-EW-BN-77, ma-FL-BN-84
ps-EW-BN-51	Extreme Weather	Victim	PE&A - Public Education & Awareness , ES - Emergency Services	City of Benicia	Most households in Benicia lack air conditioning systems (although this is changing with widespread installations).	ma-EW-BN-78, ma-EW-BN-96
ps-EW-BN-52	Extreme Weather	Victim	PE&A - Public Education & Awareness , ES - Emergency Services	City of Benicia	Benicia has a high number of senior residents who are vulnerable to high heat events.	ma-EW-BN-78, ma-EW-BN-96
ps-EW-BN-53	Extreme Weather	Threat	PRV - Prevention , PPRO - Property Protection , PE&A - Public Education & Awareness , NRP - Natural Resource Protection	City of Benicia	High mortality of pine and redwood trees throughout the City creating a hazard for high wind events, especially around roads and buildings.	ma-EW-BN-79
ps-DR-BN-54	Drought	Threat	PPRO - Property Protection , NRP - Natural Resource Protection	City of Benicia	County buildings and facilities have irrigated landscaping including turf grass, which can consume high amounts of water in times of drought.	ma-DR-BN-67, ma-DR-BN-93
ps-SR-BN-55	Sea Level Rise	Impact	PPRO - Property Protection , SP - Structural Projects	City of Benicia	The areas between 1st Street and E. 5th, between E Street and the water. B Street at E. 2nd, W 2nd St., west of E 2nd St. down to B St. are vulnerable to flooding sea level rise and king tide events.	ma-FL-BN-84, ma-SR-BN-101, ma-SR-BN-102



Problem No.	Hazard Type	Area of Concern	Mitigation Alternatives	Primary Agency	Problem Description	Related MA
ps-SR-BN-56	Sea Level Rise	Impact	SP - Structural Projects	City of Benicia	The City's wastewater treatment facility is located in a low sea level rise scenario area.	ma-SR-BN-101
ps-SR-BN-57	Sea Level Rise	Impact	PPRO - Property Protection , ES - Emergency Services , SP - Structural Projects	City of Benicia	There is concern regarding erosion due to sheet flow and sea level rise on the bluff between W. 9th Street and W. 10th Street.	ma-SR-BN-101, ma-SR-BN-102
ps-SR-BN-58	Sea Level Rise	Impact	SP - Structural Projects	City of Benicia	Fitzgerald Field is routinely flooded during high tide.	ma-SR-BN-103
ps-SR-BN-59	Sea Level Rise	Victim	PPRO - Property Protection , PE&A - Public Education & Awareness , ES - Emergency Services	City of Benicia	Approximately 1571 people live in a low sea level rise scenario area.	ma-SR-BN-101, ma-SR-BN-102, ma-SR-BN-103
ps-DR-BN-183	Drought	Impact	PRV - Prevention , PE&A - Public Education & Awareness	City of Benicia	Drought continues to cyclically worsen and is projected to increase due to climate change.	ma-DR-BN-99

1.4.4 Mitigation Action Support Tool (MAST)

As a living document, hazard problem statements and mitigation activities will be updated through a web interface application developed specifically for participating jurisdictions. The Mitigation Action Support Tool (MAST) is accessible through mitigatehazards.com/SolanoHMP/.

MAST is a web-based interactive tool that enables multiple users to search, view, enter, and update mitigation actions, ideas or projects, and other information. MAST provides participating jurisdictions and plan reviewers (Cal OES/FEMA) access to valuable mitigation information that can be leveraged by future planning or other risk reduction efforts within the County. Participating jurisdictions can update the status of their mitigation projects throughout the planning lifecycle, and this web-based tool will improve participating jurisdiction's ability to apply for FEMA's Hazard Mitigation Assistance (HMA) grant programs including initial grant application processes through Cal OES.



1.5 Mitigation Strategy

The mitigation strategy is the guidebook to future hazard mitigation administration, capturing the key outcomes of the MJHMP planning process. The mitigation strategy is intended to reduce vulnerabilities outlined in the previous section (a.k.a. problem statements) with a prescription of policies and physical projects. These mitigation actions should be compatible with existing planning mechanisms and should outline specific roles and resources for implementation success.

1.5.1 Capabilities & Adaptive Capacity Assessment

This section examines the planning and regulatory, administrative, technical, financial, educational, and outreach capabilities to augment known issues and weaknesses from identified natural hazards.

Capabilities assessments in this Volume 1 and in Volume 2 include considerations of a community's adaptive capacity for climate change, as outlined in Cal OES' 2020 California Adaptation Planning Guide. Adaptive capacity is a community or region's existing ability to moderate climate change impacts. Assessing adaptive capacity includes analysis of policies, plans, programs, funding, and staffing capacity.

The tables in this section explore various local planning mechanisms, administrative capacity, financial capabilities, and education and outreach initiatives. The columns in each table represent deeper dives into the following questions:

- Is the existing planning or regulatory mechanism used currently? (Column 1, Status)
- Has the HMP been integrated into the planning mechanism currently so that the named mechanism is currently used in HMP planning? (Column 2, Current Mitigation Use)
- Is there a future opportunity to expand, improve upon, and incorporate this 2020 HMP Update into the planning or regulatory mechanism? (Column 3, Future Opportunity)

The capabilities assessment is easily-digestible and based on color coding to indicate which policies and plans are adequate, need improvement or in which the HMP could be integrated. Each table includes a legend that explain how each one of these questions are being answered according to the color indicated: green, yellow, and orange.

For more information on the regulatory environment surrounding each hazard, see hazard-specific sections of Volume 1. Volume 1, Section 5.3.5 includes an extensive list of federal and state funding opportunities as well.



1.5.1.1 Planning and Regulatory Capabilities

Table 1-14: Planning and Regulatory Capabilities

CAPABILITY ASSESSMENT LEGEND		
Status	Current Mitigation Use	Future Opportunity
Currently in use or present.	Used widely for mitigation.	Opportunity to expand and integrate.
(Sort of) Seldomly used or limited presence.	Limited use in mitigation planning.	Limited opportunity to expand and integrate.
(No) Not present or available.	Not used in mitigation planning.	No opportunity to expand or integrate.

Resource	HMP Integration			Notes / Additional Detail
	Status	Current Mitigation Use	Future Opportunity	
Planning and Regulatory Capabilities				
Construction and Future Development Regulations				
Building Codes				2019 California Building Code
Building Code Effectiveness Grading Schedule (BCEGS) Rating				Class 3 rating by BCEGS for 1 & 2 family dwellings and class 3 for all other construction. (2018)
Public Protection (ISO Class)				
Hazard Related Development Standards				
Hazard-Specific Ordinance				
Zoning Ordinance				Benicia Municipal code Title 17 Zoning
Growth Management Ordinance				
Hazard Reduction Programs (Annually Conducted)				
Capital Improvements Program (CIP) or Plan				
Erosion/Sediment Control Program				
Hazard-Related Public Outreach Program				See Education & Outreach Capabilities for more specifics.
Stormwater Management Program (Annual Inspections)				Stormwater Management Program (update ongoing, 2021)
Seismic Safety Program (Non-structural Inspections)				
Earthquake Modernization Program (Building Safety Inspections)				
Hazard Plans				
General Plan Safety Element				Benicia General Plan part 2 Chapter 4 Community Health and Safety
Noteworthy Area/ Specific Plan with Hazard Focus				Benicia Business Park EIR, Air Quality



Resource	HMP Integration			Notes / Additional Detail
	Status	Current Mitigation Use	Future Opportunity	
Planning and Regulatory Capabilities				
Community Wildfire Protection Plan (CWPP)	Orange	Orange	Green	
Wildfire Vulnerability Assessment	Orange	Orange	Green	
Urban or Integrated Regional Water Management Plan	Green	Yellow	Green	Urban Water Management Plan, currently being updated
Floodplain Management Plan	Green	Yellow	Green	Currently being updated as part of Urban Water Mgmt Plan
Stormwater Management Plan	Green	Yellow	Green	Currently being updated as part of Urban Water Mgmt Plan
Ground Water Management Plan(s)	N/A	N/A	Green	
Open Space and Land Management Plan(s)	Green	Green	Yellow	1997 Benicia parks, trails and open space master plan, currently being updated
Emergency Operations Plan	Green	Yellow	Green	2017 Solano County Emergency Operations Plan
Climate Action Plan, Vulnerability Ass'mt, or Adaptation Plan	Green	Yellow	Green	Benicia Climate Action Plan not formally adopted
Sustainable Community Plan (SB 375)	Green	Yellow	Green	ABAG Plan Bay Area 2040 (2017)
Local Delta/ Wetlands Program(s)	Yellow	Orange	Yellow	
Downtown Plan with hazard focus	Yellow	Yellow	Green	
Community Health Assessment(s)	Green	Green	Green	2016 Solano County Community Health Assessment
National Flood Protection Program (NFIP)				
Floodplain Management Regulations	Green	Green	Yellow	
Flood Insurance Education and Technical Assist.	Green	Yellow	Green	2013 Flood Insurance Study
Flood Hazard Mapping / Re-Mapping	Green	Yellow	Green	
Community Rating System (CRS)	Orange	Orange	Green	



1.5.1.2 Administrative and Technical Capabilities

Table 1-15: Administrative and Technical Capabilities

CAPABILITY ASSESSMENT LEGEND		
Status	Current Mitigation Use	Future Opportunity
Currently in use or present.	Used widely for mitigation.	Opportunity to expand and integrate.
(Sort of) Seldomly used or limited presence.	Limited use in mitigation planning.	Limited opportunity to expand and integrate.
(No) Not present or available.	Not used in mitigation planning.	No opportunity to expand or integrate.

Resource	HMP Integration			Notes / Additional Detail
	Status	Current Mitigation Use	Future Opportunity	
Administrative and Technical				
Community Planning and Development Services				
Community Planner				
Civil Engineer				Dan Sequeria Principal Civil Engineer
Building Code Official				Rick Knight Building Dept.
Floodplain Administrator				Rachel O'Shea Building Official / Floodplain Mgr.
Fire Marshall				
Dedicated Public Outreach Personnel				Teri Davena, City PIO. Irma Widjojo, Police PIO. Della Olm, Fire PIO.
GIS Specialist and Capability				We contract with a GIS company but need more GIS data. Rebecca Brooks (PW) is point person
Emergency Manager				No specific EM. Fire Chief takes on this roll
Grant Manager, Writer, or Specialist				No specific grant-writer. Each department's MA takes on this roll. Fire MA (Della Olm) does hazard mitigation grant writing.
Other				
Warning Systems/Services				
General				AlertSolano
Flood				Emergency Alert: Flood Risk: California Department of Water Resources Flood Risk Notification Program Flood Control: Solano County Water Agency
Wildfire				AlertSolano
Geological Hazards				ShakeAlert.org (nation-wide)



1.5.1.3 Financial Capabilities

Table 1-16: Financial Capabilities

CAPABILITY ASSESSMENT LEGEND		
Status	Current Mitigation Use	Future Opportunity
Currently in use or present.	Used widely for mitigation.	Opportunity to expand and integrate.
(Sort of) Seldomly used or limited presence.	Limited use in mitigation planning.	Limited opportunity to expand and integrate.
(No) Not present or available.	Not used in mitigation planning.	No opportunity to expand or integrate.

Resource	HMP Integration			Notes / Additional Detail
	Status	Current Mitigation Use	Future Opportunity	
Fiscal Capabilities				
Financial Resources for Hazard Mitigation				
Levy for Specific Purposes with Voter Approval				
Utilities Fees				
Benefit assessments				
System Development Fee				
Various Bonds to Incur Debt				
Withheld Spending in Hazard-Prone Areas	N/A	N/A	N/A	
Stormwater Service Fees				We institute fees part of development, but not as a separate annual/monthly charge for existing or needed upgrades.
Capital Improvement Project Funding				



1.5.1.4 Education and Outreach

Table 1-17: Education and Outreach Capabilities

CAPABILITY ASSESSMENT LEGEND		
Status	Current Mitigation Use	Future Opportunity
Currently in use or present.	Used widely for mitigation.	Opportunity to expand and integrate.
(Sort of) Seldomly used or limited presence.	Limited use in mitigation planning.	Limited opportunity to expand and integrate.
(No) Not present or available.	Not used in mitigation planning.	No opportunity to expand or integrate.

Resource	HMP Integration			Notes / Additional Detail
	Status	Current Mitigation Use	Future Opportunity	
Education / Outreach Capabilities				
Education/Outreach Resources				
Website Dedicated to Hazard Topics	Green	Green	Red	Education & outreach marked as "red" opportunity indicates levels are satisfactory currently and thus no need for expansion or better incorporation of hazard mitigation.
Dedicated Social Media	Green	Green	Red	
Hazard Info. Avail. at Library/ Planning Desk	Green	Green	Red	
Annual Public Safety Events	Green	Green	Red	
Ability to Field Public Tech. Assistance Requests	Yellow	Yellow	Green	
Public Safety Newsletters or Printed Outreach	Red	Yellow	Yellow	
Fire Safe Councils	Red	Yellow	Yellow	
Resource Conservation Districts	Green	Yellow	Green	Solano Resource Conservation District

1.5.1.5 Capability and Adaptive Capacity Opportunities

The City of Benicia identified many opportunities for strengthening community capabilities and adaptive capacity. The City considered this assessment in developing its Mitigation Strategy in Section 1.5.2.

Notably, the City identified additional staffing capacity including GIS data and processing, emergency management duties, and grant writing assistance. The City is updating several planning documents that will improve planning and regulatory capacity. The City also had good capacity under its current codes and current education and outreach capacity.

Volume 1, Section 5.3.5 includes an extensive list of federal and state funding opportunities to leverage to improve community capabilities.



1.5.2 Mitigation Actions

Mitigation actions were developed based upon the jurisdiction’s priorities, risk assessment results, and mitigation alternatives. The mitigation action prioritization method used by all participating jurisdictions is described in Section 5.5.1 of Volume 1. Table 1-18 lists each priority mitigation action, responsible party, time frame, potential funding source, implementation steps, and resources need to implement based upon the Planning Committee consensus.

Each participating jurisdiction, including the City of Benicia, considered ongoing relevancy of mitigation actions from the existing MJHMP and retained or removed such actions while adding new relevant actions as well. Mitigation actions were examined for relevancy and the potential for future implementation and then evaluated for potential follow-up. Some mitigation actions developed during the previous HMP effort were not included because they were an inherent part of the HMP update process or were not detailed enough for implementation at a local Jurisdiction level. the City of Benicia has made significant changes to other mitigation actions because of the updated risk assessment and implementation strategy, to include more detail, or to update based on current mitigation practices. Volume 1, Section 5.5.2 provides a record of County wide mitigation actions, the status, and additional notes for each action.

Table 1-18 lists each mitigation action for the City of Benicia. Each participating jurisdiction developed unique mitigation actions, targeted at their own unique priorities and vulnerabilities. Each mitigation action identifies the responsible party, time frame, potential funding source, implementation steps and resources needed to implement these priority mitigation actions. As a living document, hazard problem statements and mitigation activities will be updated through MAST. The detail in Table 1-18 meets the regulatory requirements of FEMA and DMA 2000.

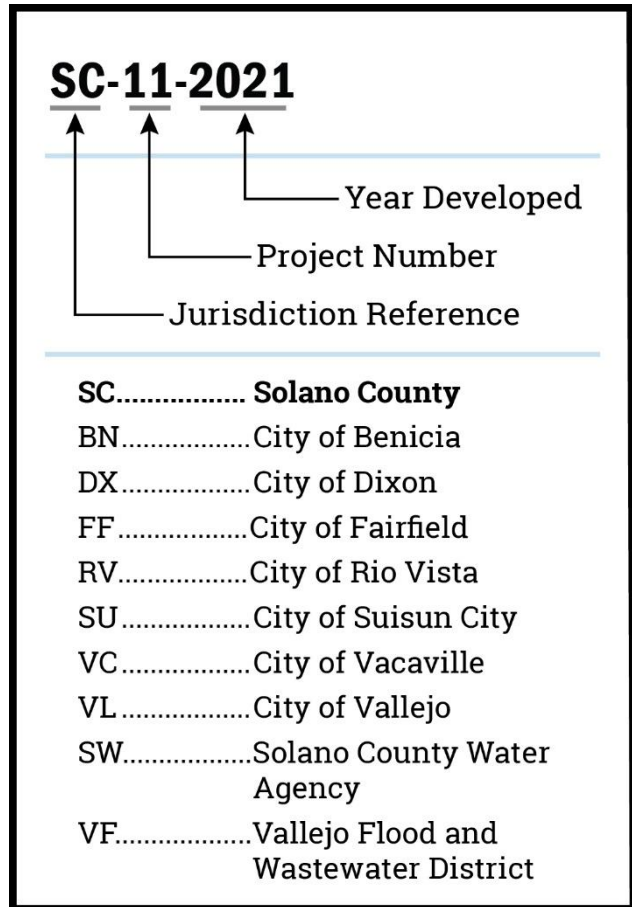


Figure 1-20: Mitigation Action Key



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Table 1-18: City of Benicia Mitigation Actions

Mitigation No.	Hazard Type	Mitigation Type	Status	Year	Primary Agency	Title/Description	Responsible Party	Estimated Cost	Estimated Benefit	Time Frame	HMA Activity Type	Potential Grant Source	Priority	Related Goal(s)	Related Problem Statements
ma-AH-BN-65	All Hazard	SP - Structural Projects	Pending	2021	City of Benicia	Install Emergency Power Generators for City critical facilities as needed, including for the Clock Tower Emergency Shelter.	Building and Public Works	Medium - The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.	High - Project will provide an immediate reduction of risk exposure for life and property.	1-3 Years	Project	HMGP / BRIC	High	Goal 2: Infrastructure , Goal 4: Resilience	ps-AH-BN-15, ps-AH-BN-16, ps-EW-BN-49
ma-AH-BN-82	All Hazard	PRV - Prevention	Ongoing	2017	City of Benicia	Evaluate Public Safety Communications Infrastructure including Radio Communications	Police Department and Fire Department	Medium - The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.	High - Project will provide an immediate reduction of risk exposure for life and property.	1-3 Years	Planning	HMGP / BRIC , EMPG	Medium	Goal 1: People , Goal 2: Infrastructure	ps-EQ-BN-22, ps-FL-BN-39, ps-WF-BN-42
ma-AH-BN-85	All Hazard	PRV - Prevention	Pending	2017	City of Benicia	Develop Post Emergency Inspection and Plan Check Protocols	Community Development Department	Medium - The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.	High - Project will provide an immediate reduction of risk exposure for life and property.	1-3 Years	Planning	HMGP / BRIC	High	Goal 4: Resilience	ps-EQ-BN-18
ma-AH-BN-86	All Hazard	PRV - Prevention	Ongoing	2017	City of Benicia	Update Critical Facilities, Vulnerable Building Types & Infrastructure Mapping for Hazard Identification	Community Development Department and Public Works Dept.	Medium - The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.	High - Project will provide an immediate reduction of risk exposure for life and property.	Ongoing	Planning	HMGP / BRIC	High	Goal 2: Infrastructure	ps-EQ-BN-17, ps-EQ-BN-24, ps-EQ-BN-25, ps-EQ-BN-26
ma-AH-BN-98	All Hazard	PRV - Prevention	Ongoing	2017	City of Benicia	Expand Training Program for City Staff of Emergency Operations Center	Fire Department	Medium - The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.	High - Project will provide an immediate reduction of risk exposure for life and property.	Ongoing	Planning	HMGP / BRIC	High	Goal 4: Resilience	ps-WF-BN-44, ps-WF-BN-42, ps-EQ-BN-22

Mitigation No.	Hazard Type	Mitigation Type	Status	Year	Primary Agency	Title/Description	Responsible Party	Estimated Cost	Estimated Benefit	Time Frame	HMA Activity Type	Potential Grant Source	Priority	Related Goal(s)	Related Problem Statements
ma-DR-BN-67	Drought	NRP - Natural Resource Protection	Pending	2021	City of Benicia	Replace irrigated landscaping with drought resistant vegetation and increase use of recycled water for irrigation in City-owned facilities	City of Benicia	Medium - The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.	High - Project will provide an immediate reduction of risk exposure for life and property.	1-3 Years	Project	HMGP / BRIC	High	Goal 2: Infrastructure , Goal 3: Environment	ps-DR-BN-54
ma-DR-BN-93	Drought	PRV - Prevention	Ongoing	2017	City of Benicia	Conduct Turf Analysis as part of the Parks, Trails, and Open Space Master Plan Update (plan underway in 2021).	Parks & Community Services	Medium - The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.	High - Project will provide an immediate reduction of risk exposure for life and property.	1-3 Years	Planning	HMGP / BRIC , Internal Funding	High	Goal 3: Environment , Goal 4: Resilience	ps-DR-BN-54
ma-DR-BN-99	Drought	PE&A - Public Education & Awareness	Ongoing	2017	City of Benicia	Increase Public Education About Water Conservation	Public Works Department	Medium - The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.	High - Project will provide an immediate reduction of risk exposure for life and property.	Ongoing	5%	HMGP / BRIC , Internal Funding	Medium	Goal 4: Resilience	ps-DR-BN-183
ma-EQ-BN-68	Earthquake	SP - Structural Projects	Pending	2021	City of Benicia	Conduct seismic retrofits of city-owned buildings and infrastructure throughout the jurisdiction, and reinforce soil to withstand liquefaction.	City of Benicia	High - Existing funding will not cover the cost of the project; implementation would require new revenue through an alternative source (for example, bonds, grants, and fee increases).	High - Project will provide an immediate reduction of risk exposure for life and property.	3-5 Years	Project	HMGP / BRIC	High	Goal 2: Infrastructure	ps-EQ-BN-17, ps-EQ-BN-18, ps-EQ-BN-19, ps-EQ-BN-21, ps-EQ-BN-22, ps-EQ-BN-23, ps-EQ-BN-29, ps-EQ-BN-31, ps-EQ-BN-32
ma-EQ-BN-69	Earthquake	SP - Structural Projects	Pending	2021	City of Benicia	Install seismic shut-off valves on gas fixtures on City-owned critical facilities and lines.	Public Works	High - Existing funding will not cover the cost of the project; implementation would require new revenue through an alternative source (for example, bonds, grants, and fee increases).	High - Project will provide an immediate reduction of risk exposure for life and property.	3-5 Years	Project	HMGP / BRIC	High	Goal 1: People , Goal 2: Infrastructure	ps-EQ-BN-28
ma-EQ-BN-70	Earthquake	SP - Structural Projects	Pending	2021	City of Benicia	Conduct geotechnical evaluation and appropriate seismic retrofits of City's Wastewater Treatment Plant.	City of Benicia	High - Existing funding will not cover the cost of the project; implementation would require new revenue through an alternative source (for example, bonds, grants, and fee increases).	High - Project will provide an immediate reduction of risk exposure for life and property.	1-3 Years	Project	HMGP / BRIC	High	Goal 1: People , Goal 2: Infrastructure	ps-EQ-BN-21

Mitigation No.	Hazard Type	Mitigation Type	Status	Year	Primary Agency	Title/Description	Responsible Party	Estimated Cost	Estimated Benefit	Time Frame	HMA Activity Type	Potential Grant Source	Priority	Related Goal(s)	Related Problem Statements
ma-EQ-BN-71	Earthquake	PE&A - Public Education & Awareness	Pending	2021	City of Benicia	Conduct public education campaign on earthquake preparedness and seismic housing retrofits.	City of Benicia	Low - The project could be funded under the existing budget. The project is part of or can be part of an ongoing existing program.	High - Project will provide an immediate reduction of risk exposure for life and property.	Annually	5%	HMGP / BRIC	High	Goal 4: Resilience	ps-EQ-BN-22
ma-EQ-BN-83	Earthquake	PRV - Prevention	Pending	2017	City of Benicia	Conduct Vulnerability Assessment of the City's Police Station to Groundshaking	Police Department	High - Existing funding will not cover the cost of the project; implementation would require new revenue through an alternative source (for example, bonds, grants, and fee increases).	High - Project will provide an immediate reduction of risk exposure for life and property.	1-3 Years	Planning	HMGP / BRIC	Medium	Goal 2: Infrastructure	ps-EQ-BN-18
ma-EQ-BN-87	Earthquake	PRV - Prevention	Pending	2017	City of Benicia	Draft Natural Gas Shut-Off Valve Ordinance	Community Development Department	Medium - The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.	High - Project will provide an immediate reduction of risk exposure for life and property.	1-3 Years	Planning	HMGP / BRIC	High	Goal 1: People , Goal 2: Infrastructure	ps-EQ-BN-20, ps-EQ-BN-27, ps-EQ-BN-28
ma-EQ-BN-89	Earthquake	PRV - Prevention	Pending	2017	City of Benicia	Evaluate Jurisdictional Ordinances and Programs for Earthquake Retrofit of Unreinforced Masonry Structures.	Community Development	Medium - The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.	High - Project will provide an immediate reduction of risk exposure for life and property.	1-3 Years	Planning	HMGP / BRIC	High	Goal 2: Infrastructure , Goal 4: Resilience	ps-EQ-BN-18, ps-EQ-BN-19, ps-EQ-BN-21, ps-EQ-BN-22
ma-EW-BN-77	Extreme Weather	SP - Structural Projects	Pending	2021	City of Benicia	Construct a breakwater to protect the W 9th St. City Pier.	City of Benicia	High - Existing funding will not cover the cost of the project; implementation would require new revenue through an alternative source (for example, bonds, grants, and fee increases).	High - Project will provide an immediate reduction of risk exposure for life and property.	1-3 Years	Project	HMGP / BRIC	High	Goal 2: Infrastructure	ps-EW-BN-50
ma-EW-BN-78	Extreme Weather	PE&A - Public Education & Awareness	Pending	2021	City of Benicia	Conduct a public education campaign to increase awareness of the negative effects of extreme heat; include information on steps that households can take to mitigate these effects such as the location of emergency cooling centers.	City of Benicia	Low - The project could be funded under the existing budget. The project is part of or can be part of an ongoing existing program.	High - Project will provide an immediate reduction of risk exposure for life and property.	Annually	Planning	HMGP / BRIC , Internal Funding	High	Goal 1: People , Goal 4: Resilience	ps-EW-BN-51, ps-EW-BN-52

Mitigation No.	Hazard Type	Mitigation Type	Status	Year	Primary Agency	Title/Description	Responsible Party	Estimated Cost	Estimated Benefit	Time Frame	HMA Activity Type	Potential Grant Source	Priority	Related Goal(s)	Related Problem Statements
ma-EW-BN-79	Extreme Weather	PRV - Prevention	Pending	2021	City of Benicia	Replace dying or dead evergreen vegetation with wind resistant vegetation and implement annual tree trimming program.	City of Benicia	Medium - The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.	High - Project will provide an immediate reduction of risk exposure for life and property.	Annually	Project	HMGP / BRIC , Internal Funding	Medium	Goal 3: Environment , Goal 4: Resilience	ps-EW-BN-53
ma-EW-BN-96	Extreme Weather	PRV - Prevention	Ongoing	2017	City of Benicia	Develop Operational Guidelines for Cooling Centers	Fire Department	Medium - The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.	High - Project will provide an immediate reduction of risk exposure for life and property.	1-3 Years	Planning	HMGP / BRIC	High	Goal 1: People , Goal 4: Resilience	ps-EW-BN-49, ps-EW-BN-51, ps-EW-BN-52
ma-FL-BN-80	Flood	SP - Structural Projects	Pending	2021	City of Benicia	Retrofit infrastructure in 100 year floodplains as needed and ensure they conform to existing 100-year floodplain elevation standards.	Public Works Department	High - Existing funding will not cover the cost of the project; implementation would require new revenue through an alternative source (for example, bonds, grants, and fee increases).	High - Project will provide an immediate reduction of risk exposure for life and property.	1-3 Years	Project	HMGP / BRIC	High	Goal 2: Infrastructure	ps-FL-BN-33, ps-FL-BN-35, ps-EW-BN-48
ma-FL-BN-84	Flood	PRV - Prevention	Ongoing	2017	City of Benicia	Implement Urban Waterfront Enhancement Master Plan	Parks & Community Services, Community Development Department, Public Works, Library, & Economic Development	Medium - The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.	High - Project will provide an immediate reduction of risk exposure for life and property.	1-3 Years	Planning	HMGP / BRIC	Medium	Goal 2: Infrastructure , Goal 4: Resilience	ps-EW-BN-50, ps-SR-BN-55
ma-FL-BN-88	Flood	PRV - Prevention	Ongoing	2017	City of Benicia	Increase use of Stormwater Management and create Flood Mitigation Plan	Public Works Department - Engineering	High - Existing funding will not cover the cost of the project; implementation would require new revenue through an alternative source (for example, bonds, grants, and fee increases).	High - Project will provide an immediate reduction of risk exposure for life and property.	1-3 Years	Planning	HMGP / BRIC	High	Goal 4: Resilience	ps-FL-BN-34, ps-FL-BN-38, ps-FL-BN-37, ps-FL-BN-39, ps-FL-BN-40

Mitigation No.	Hazard Type	Mitigation Type	Status	Year	Primary Agency	Title/Description	Responsible Party	Estimated Cost	Estimated Benefit	Time Frame	HMA Activity Type	Potential Grant Source	Priority	Related Goal(s)	Related Problem Statements
ma-FL-BN-95	Flood	PRV - Prevention	Ongoing	2017	City of Benicia	Conduct Flood Fighting Training from the Department of Water Resources	Fire Department; Public Works, Parks, and Police Dept	Medium - The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.	High - Project will provide an immediate reduction of risk exposure for life and property.	Annually	N/A	EMPG , Internal Funding	High	Goal 1: People , Goal 4: Resilience	ps-EW-BN-47, ps-EW-BN-48, ps-FL-BN-33, ps-FL-BN-34, ps-FL-BN-36, ps-FL-BN-37, ps-FL-BN-39, ps-FL-BN-40, ps-FL-BN-35
ma-FL-BN-147	Flood	SP - Structural Projects	Pending	2021	City of Benicia	Make improvements to existing floodwall to protect against 100-year flood event.	City of Benicia	Medium - The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.	High - Project will provide an immediate reduction of risk exposure for life and property.	1-3 Years	Project	HMGP / BRIC	High	Goal 2: Infrastructure	ps-FL-BN-33
ma-FL-BN-148	Flood	PRV - Prevention	Pending	2021	City of Benicia	Conduct flood study to determine whether flood channel can be enhanced or detention basins added.	City of Benicia	Medium - The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.	High - Project will provide an immediate reduction of risk exposure for life and property.	1-3 Years	Planning	HMGP / BRIC	High	Goal 2: Infrastructure , Goal 4: Resilience	ps-EW-BN-47
ma-SR-BN-101	Sea Level Rise	PRV - Prevention	Pending	2021	City of Benicia	Incorporate consideration of sea level rise into the City's Capital Improvement Program, and into the design and funding of infrastructure.	City of Benicia	Medium - The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.	High - Project will provide an immediate reduction of risk exposure for life and property.	Ongoing	Planning	HMGP / BRIC , FMA	High	Goal 4: Resilience	ps-SR-BN-55, ps-SR-BN-56, ps-SR-BN-57, ps-SR-BN-59
ma-SR-BN-102	Sea Level Rise	PRV - Prevention	Pending	2021	City of Benicia	Incorporate sea level rise and coastal flooding potential into existing and future recovery plans.	City of Benicia	Medium - The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.	High - Project will provide an immediate reduction of risk exposure for life and property.	1-3 Years	Planning	HMGP / BRIC , FMA	High	Goal 4: Resilience	ps-SR-BN-55, ps-SR-BN-57, ps-SR-BN-59

Mitigation No.	Hazard Type	Mitigation Type	Status	Year	Primary Agency	Title/Description	Responsible Party	Estimated Cost	Estimated Benefit	Time Frame	HMA Activity Type	Potential Grant Source	Priority	Related Goal(s)	Related Problem Statements
ma-SR-BN-103	Sea Level Rise	PRV - Prevention	Pending	2021	City of Benicia	Prepare a Downtown Sea Level Rise Adaptation Strategy	City of Benicia	Medium - The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.	High - Project will provide an immediate reduction of risk exposure for life and property.	1-3 Years	Planning	HMGP / BRIC , FMA	High	Goal 2: Infrastructure , Goal 4: Resilience	ps-SR-BN-58, ps-SR-BN-59
ma-WF-BN-90	Wildfire	PRV - Prevention	Ongoing	2017	City of Benicia	Implement a Defensible Space Program with Site Specific Assessment (assessment underway in 2021)	Fire Department	Medium - The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.	High - Project will provide an immediate reduction of risk exposure for life and property.	3-5 Years	Planning	HMGP / BRIC , AFG , FP&S , Internal Funding	High	Goal 1: People , Goal 3: Environment , Goal 4: Resilience	ps-WF-BN-41, ps-WF-BN-41, ps-WF-BN-44, ps-WF-BN-46
ma-WF-BN-104	Wildfire	SP - Structural Projects	Pending	2021	City of Benicia	Install fire sprinkler suppression system for City Hall and the Police Department	City of Benicia	Medium - The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.	High - Project will provide an immediate reduction of risk exposure for life and property.	1-3 Years	Project	FP&S , Internal Funding	High	Goal 1: People , Goal 2: Infrastructure	ps-WF-BN-43
ma-WF-BN-105	Wildfire	PE&A - Public Education & Awareness	Pending	2021	City of Benicia	Conduct Public Education Campaign to increase awareness of threats of wildfire due to recreational use.	Benicia Fire Department	Low - The project could be funded under the existing budget. The project is part of or can be part of an ongoing existing program.	High - Project will provide an immediate reduction of risk exposure for life and property.	1-3 Years	Planning	HMGP / BRIC		Goal 4: Resilience	ps-WF-BN-45, ps-WF-BN-46
ma-WF-BN-114	Wildfire	PRV - Prevention	Ongoing	2021	City of Benicia	Implement recommendations from City's 2021-2022 Defensible Space Program & Site-specific Assessment Project	Fire Department	High - Existing funding will not cover the cost of the project; implementation would require new revenue through an alternative source (for example, bonds, grants, and fee increases).	High - Project will provide an immediate reduction of risk exposure for life and property.	3-5 Years	Project	HMGP / BRIC , AFG , FP&S , Internal Funding	High	Goal 4: Resilience	ps-WF-BN-41, ps-WF-BN-42, ps-WF-BN-45,
ma-WF-BN-115	Wildfire	PRV - Prevention	Pending	2017	City of Benicia	Develop an Urban Interface Ordinance	Fire Department; Community Development	Medium - The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.	Medium - Project will have a long-term impact on the reduction of risk exposure for life and property, or project will not provide an immediate reduction in the risk exposure for property.	3-5 Years	Planning	HMGP / BRIC , Internal Funding	High	Goal 1: People , Goal 4: Resilience	ps-WF-BN-42, ps-WF-BN-44

SECTION 2

JURISDICTIONAL ANNEX:

City of Dixon



SOLANO COUNTY

MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

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FINAL for adoption



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Solano County
Multi-Jurisdiction Hazard Mitigation Plan
CITY OF DIXON (DX.)
Municipal Annex

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Adoption Resolution

To comply with DMA 2000, the City of Dixon has officially adopted this Solano County Multi-Jurisdictional Hazard Mitigation Plan (MJHMP), Volume 1, and its jurisdictional annex. The adoption of the MJHMP recognizes the City’s commitment to reducing the impacts of natural hazards. See included adoption resolution.

RESOLUTION NO. 22-073

ADOPTING THE UPDATED SOLANO COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

WHEREAS, the City of Dixon, a political subdivision of the State of California, is an official participating jurisdiction in the updated Solano Multi-Jurisdiction Hazard Mitigation Plan ("MJHMP"); and

WHEREAS, the City of Dixon recognizes the updated MJHMP as the official hazard mitigation plan for participating jurisdictions; and

WHEREAS, the City of Dixon has gathered information and prepared the updated MJHMP in accordance with Federal Emergency Management Agency (FEMA) requirements at 44 CFR § 201.6

WHEREAS, Volume 1 of the updated MJHMP recognizes the threat that natural hazards pose to people and property Solano County-wide; and

WHEREAS, the City of Dixon's Annex to Volume 1 of the updated MJHMP provides additional information specific to the City of Dixon, with a focus on providing additional details on the planning process, risk assessment, and mitigation strategy for this community; and

WHEREAS, the City of Dixon has reviewed Volume 1 of the updated MJHMP and its Annex and affirms that the plan actions in Volume 1 and its Annex should reduce the potential for harm to people and property from future hazard occurrences within the community; and

WHEREAS, the U. S. Congress passed the Disaster Mitigation Act of 2000 ("Disaster Mitigation Act") emphasizing the need for pre-disaster mitigation of potential hazards; and

WHEREAS, the Disaster Mitigation Act made available mitigation grants to state and local governments; and

WHEREAS, an adopted hazard mitigation plan is required as a condition of future funding for mitigation projects under multiple FEMA pre- and post-disaster mitigation grant programs; and

WHEREAS, the City of Dixon fully participated in the FEMA-prescribed mitigation planning process to prepare this updated MJHMP; and

WHEREAS, the residents were afforded opportunities to comment and provide input in the updated MJHMP and the mitigation actions in the Plan; and

WHEREAS, the City of Dixon, as a fully participating jurisdiction of the updated MJHMP, is an eligible sub-applicant to the State of California under FEMA's hazard mitigation grant program guidance; and

WHEREAS, the California Office of Emergency Services (Cal OES), and the FEMA Region IX officials have reviewed the updated MJHMP, and approved it contingent upon this official adoption by the participating governing body; and

WHEREAS, the City of Dixon desires to comply with the requirements of the Disaster Mitigation Act and to augment its emergency planning efforts by formally adopting the updated MJHMP; and

WHEREAS, adoption by the governing body for the City of Dixon demonstrates the jurisdiction's commitment to fulfilling the mitigation goals and objectives outlined in this updated MJHMP; and

WHEREAS, adoption of this plan helps to coordinate the responsible agencies to carry out their responsibilities under the updated MJHMP.

NOW, THEREFORE, IT IS RESOLVED BY THE CITY COUNCIL OF THE CITY OF DIXON AS FOLLOWS:

1. That the City Council finds the facts mentioned above to be true and further finds that this City Council has jurisdiction to consider, approve, and adopt the subject of this Resolution.
2. That the City Council does hereby adopt the updated Solano County Multi-Jurisdiction Hazard Mitigation Plan Volume 1 and its Annex, as approved by FEMA and Cal OES, as the official mitigation plan for the City of Dixon.
3. That the City Council authorizes the Solano County Emergency Services Manager to submit an approved and signed copy of this adoption resolution to the California Office of Emergency Services and FEMA Region IX officials to enable the plan's final approval in accordance with the requirements of the Disaster Mitigation Act of 2000.

PASSED AND ADOPTED THIS 5TH DAY OF APRIL, 2022, BY THE FOLLOWING VOTE:

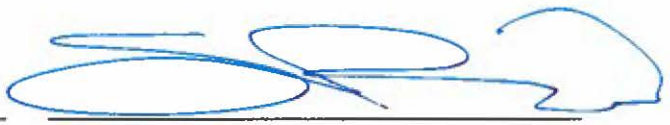
AYES: Ernest, Hendershot, Johnson, Pederson, Bird
NOES: None
ABSENT: None
ABSTAIN: None

RESOLUTION NO.: 22 - 073
DATE: APR 05 2022

ATTEST:



Kristin M. Janisch
Elected City Clerk



Steven C. Bird
Mayor

RESOLUTION NO.: 22 - 073
DATE: APR 05 2022



Section 2. City of Dixon

2.1 Purpose

This Annex details the hazard mitigation planning elements specific to the City of Dixon. This Annex is not intended to be a standalone document but appends to and supplements the information contained in the umbrella plan document. As such, all sections of the umbrella plan, including the planning process and other procedural requirements apply to and were met by the City of Dixon. This Annex provides additional information specific to the City of Dixon, with a focus on providing additional details on the planning process, risk assessment, and mitigation strategy for this community.

Hazard Mitigation Plan Points of Contact

Primary Point of Contact

Todd McNeal, Fire Chief
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Dixon, CA 95620
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Alternate Point of Contact

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(707) 678-7000 ext. 1101
e-mail: jlindley@ci.dixon.ca.us

2.2 Planning Methodology

The City of Dixon followed the planning process detailed in Volume 1, Section 3, including participating in the County Hazard Mitigation Planning Committee (HMPC) and Steering Committee and formulating their own internal planning team to support the broader planning process. Internal planning participants, their positions, and how they participated in the planning process are shown in Table 2-1.

Table 2-1: Planning Committee Members

Planning Committee Members	Department
Todd McNeal	Fire Chief
Dave Horigan	Parks & Maintenance Supervisor
Jim Lindley	City Manager
Joe Leach	Public Works Director & City Engineer
Joel Engrahm	Building Inspector II
Rachel Ancheta	Human Resources & Risk Manager
Sandy Soriano	Public Information Officer
Scott Greeley	Associate Planner

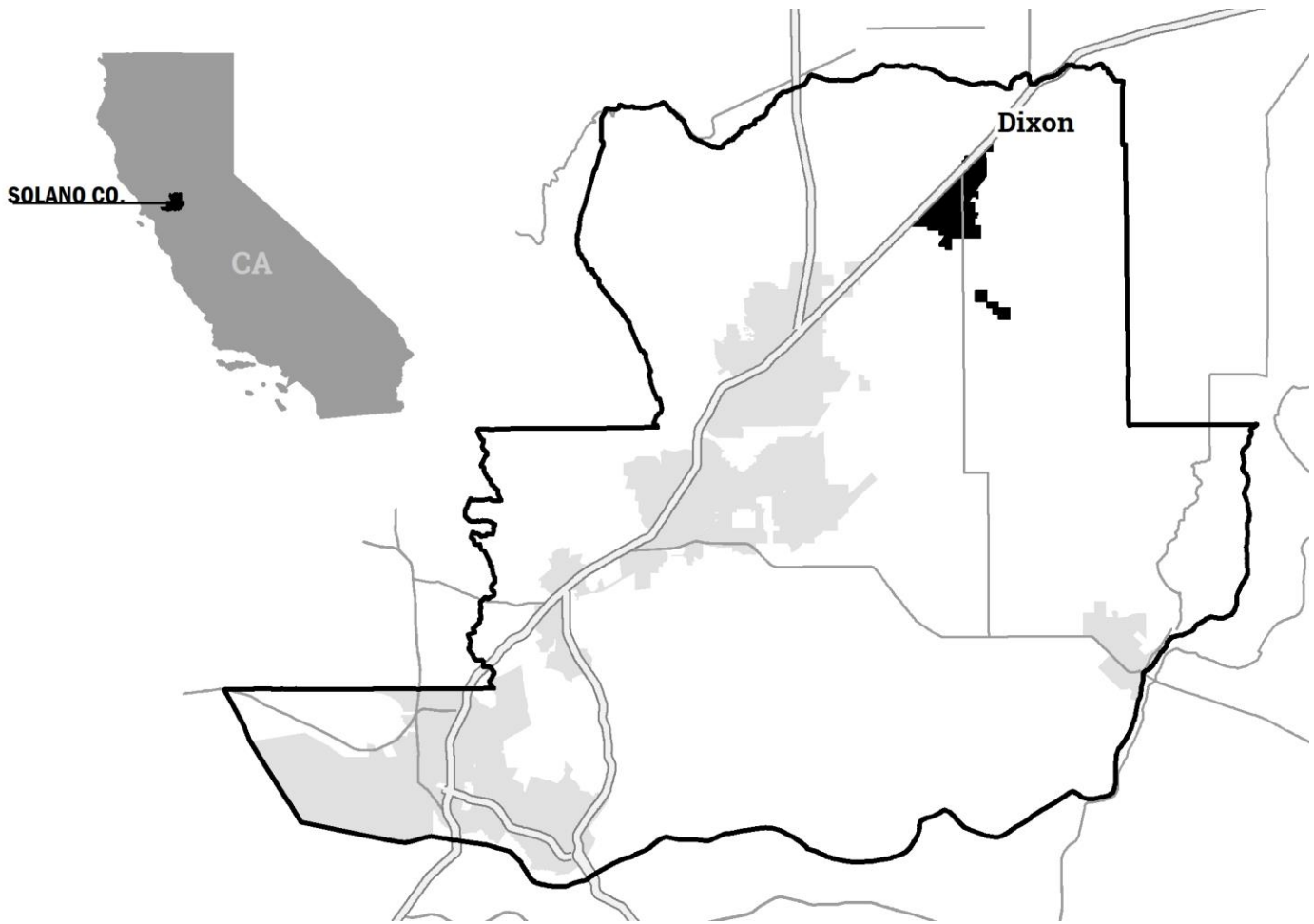


Figure 2-1: City of Dixon Location

2.3 What's New

The City of Dixon has not had a hazard mitigation plan since participating in the 2006 Association of Bay Area Governments MJHMP. Because the City's annex to the ABAG Plan is so old, the Planning Committee elected to not include any of the mitigation actions from the earlier plan in this MJHMP. Starting fresh will ensure that the City's mitigation strategy addresses its most pressing current vulnerabilities. The City's efforts to incorporate hazard mitigation into other planning mechanisms are documented in Section 2.5.1, the Capabilities Assessment.



2.3.1 Success Stories

Artificial Turf Fields: In effort to respond to drought conditions, the City recently installing artificial turf in many City-owned fields through the city.

Subsidized Desalination Station: The City of Dixon has also instituted subsidized desalination stations which reduce the need for salt filters to make water softer. The water softening company now removes cartridges which aids in regional salinity, putting less salt back into the system.

Dam Emergency Action Plan: Lastly, the City of Dixon has also developed a dam emergency action plan, which has been submitted to CalOES, to address the City-owned dam "Pond A."

2.4 Risk Assessment

The intent of this section is to profile the City of Dixon's hazards and assess the City's vulnerabilities, distinct from that of the County wide planning area. The hazard profiles in Volume 1 discuss overall impacts to the planning area and describes the hazard problem description, hazard extent, magnitude/severity, previous occurrences of hazard events and the likelihood of future occurrences. For more information on Risk Assessment Methodologies, see Vol. 1 and Appendix A.

2.4.1 Hazard Screening Criteria

Planning Team members from each participating jurisdiction collectively discussed which hazards should be profiled in the Plan and which should not. The results of that discussion can be found in Table 2-2. Detailed hazard profiles of the most significant County wide hazards are described in Section 4 of Volume 1. The Planning Team reviewed previously prepared hazard mitigation plans and other relevant documents to determine the realm of natural hazards that have the potential to affect the City of Dixon. Table 2-3 provides a crosswalk of hazards identified in Vol. 1 of this plan, the City of Dixon General Plan, and 2018 California State Hazard Mitigation Plan. The crosswalk was used to develop a preliminary hazards list, providing a framework for the Planning Team members to evaluate which hazards were truly relevant to the City of Dixon and which ones were not. Section 2.4.2 below describes the hazard risk ranking process that was performed by the planning team which prioritized hazards that are specifically relevant to the City of Dixon.



Table 2-2: County-Wide Hazard Prioritization

Hazard Type	Explanation
Climate Change	High priority county-wide, profiled hazard.
Dam/ Levee failure	Dam failure is possible in Solano County but is best addressed in other plans, specifically Emergency Action Plans for high hazard dams affecting Solano County.
Drought	High priority county-wide, profiled hazard.
Earthquake/ Geologic Hazards	High priority county-wide, profiled hazard.
Flood	High priority county-wide, profiled hazard.
Hazardous Material	While hazardous materials can release and impact the County, there are better avenues to address this hazard outside this plan.
High Winds/ Straight Line Winds	High priority county-wide, profiled as part of Extreme Weather.
Insect Hazards	While hazardous insects exist in Solano County, this was not considered a priority and is not profiled in this plan.
Pandemic Disease	While pandemic disease can impact the County, there are better avenues to address this hazard outside this plan.
Extreme Weather, including:	High priority county-wide for high wind, heavy rain, and high heat.
Extreme Heat	Profiled as part of Extreme Weather.
Hail	Hail events are rare and not considered a priority.
High Wind	Profiled as part of Extreme Weather.
Heavy Rain	Profiled as part of Extreme Weather.
Fog	Fog events are rare and are not considered a priority.
Lightning	Not a priority as an extreme weather event; discussed as source of wildfire.
Severe Thunderstorm	Severe thunderstorms were not identified as a priority in this plan.
Winter Storm / Extreme Cold/ Freeze Events	Winter storms are rare in Solano County and not identified as a priority for this plan.
Slope Failure	High priority county-wide, profiled hazard.
Soil Hazards	While limited soil hazards exist in Solano County (erosion and shifting soils), these are not prioritized in this plan. Erosion discussed under flood hazard.
Terrorism/Human Caused Threats	While terrorism is certainly a threat to the County and participating jurisdictions, it is best addressed in other plans as this HMP does not address human-caused threats.
Tornado	Impacts to the County from tornados are extremely unlikely, if any.
Volcanic Activity	Due to distance from volcanoes and the limited chance of an eruption, this hazard was not identified as a priority.
Wildfire	High priority county-wide, profiled hazard.



Table 2-3: City Document Review Crosswalk

Hazards	2020 Dixon General Plan	2014 Solano County HMP	2018 California State HMP
Agricultural Pests			■
Climate Change	■	■	■
Dam Failure	■	■	■
Drought	■	■	■
Earthquake	■	■	■
Flood	■	■	■
Landslide		■	■
Levee Failure			■
Manmade Hazards	■		■
Pandemic Disease			■
Sea Level Rise		■	■
Extreme Weather		■	■
Soil Hazards			■
Terrorism & Tech Hazards	■		■
Tsunami			■
Volcano			■
Wildfire	■	■	■

2.4.2 Hazard Risk Ranking

The City of Dixon’s Planning Team used the same hazard prioritization process as the Solano County Hazard Mitigation Planning Committee. This process is described in detail in Section 4.3.1 of Vol. 1. Figure 2-2 displays the results of the hazard risk ranking exercise that was performed by the Planning Team. The Planning Team chose to assess the City of Dixon’s vulnerability to the following hazards:

- Flood
- Extreme Weather
(High heat, Heavy rain, High wind)
- Climate Change
- Earthquake
- Drought

All of these hazards have been profiled in Vol. 1 of this document. The purpose of this annex to specifically address the City of Dixon’s vulnerability to these specifically-identified hazards.

2.4.3 Vulnerability Assessment

Assessing vulnerabilities exposes the unique characteristics of individual hazards and begins the process of narrowing down which areas within the City of Dixon are vulnerable to specific hazard events. The vulnerability assessment considered unique local knowledge of hazards and impacts and a GIS overlaying



method for examining such vulnerabilities more in depth. Using these methods, participating jurisdictions estimated vulnerable populations, infrastructure, and potential losses from hazards.

2.4.3.1 Risk Assessment

Each participating jurisdiction developed a risk matrix that assessed the probability and impact of various hazards within the jurisdiction. Figure 2-2 is the jurisdiction's risk assessment, which was completed in part using the web based and interactive Risk Assessment Mapping Platform (RAMP), accessed via the project website at www.mitigatehazards.com. RAMP allows interactive discovery of robust risk, vulnerability, and exposure data developed especially for Solano County. RAMP is a mapping platform built specifically for mitigation planning. It displays County/jurisdiction facilities and buildings overlaid with natural hazards layers to bring interactivity and individual discovery to the GIS analysis performed for the MJHMP. See Vol. 1 for a detailed description of RAMP. The Planning Team used RAMP in meetings and as needed to understand vulnerabilities to the City of Dixon. Users interactively filter facilities and buildings by natural hazard zones and/or construction characteristics. The City of Dixon also conducted a more detailed climate vulnerability assessment, included as Appendix A to this annex. The climate vulnerability assessment analyzed climate-related vulnerabilities by considering the impact from the climate vulnerability and the community's adaptive capacity to respond to the vulnerability.

2.4.3.2 Exposure Maps and Damage Estimation Tables

The included snapshot maps and damage estimation tables illustrate the City of Dixon's vulnerability to specific hazards. Based on the risk assessment, the snapshot maps focus on those hazards prioritized by the jurisdiction. These maps helped the Planning Team understand the exposure of population, parcels, and critical infrastructure to specific hazards. Each map contains an exposure summary that displays the percent of the population, the improvement and content value of parcels, and the amount of critical infrastructure that is exposed to each respective hazard. For flood and earthquake, detailed damage estimations were conducted through FEMA's Hazus software and are shown in tabular form. Additional mapping is also included. Figures and tables include:

- Figure 2-3: Dixon - FEMA Flood Risk Exposure
- Table 2-4: Dixon - Damage Estimate Summaries, 100 YR Flood
- Figure 2-4: Dixon - BAM 200-YR Flooding and Awareness Zones
- Figure 2-5: Dixon - Hayward Rodger's Creek EQ Scenario (M7.1)
- Table 2-5: Dixon - Hayward Roger's Creek Damage Estimation Summaries
- Figure 2-6: Dixon - Concord Green Valley EQ Scenario (M6.8)
- Table 2-6: Dixon - Concord Green Valley Damage Estimate Summaries
- Figure 2-7: Dixon – Areas with Potential for Liquefaction
- Figure 2-8: Dixon - 30-YR Normal Maximum Temperature for July
- Figure 2-9: Dixon - Average Annual Precipitation (1981-2010)
- Figure 2-10: Dixon - Average Annual Wind Speed (Power Class)
- Figure 2-11: Drought Severity Timeline - Suisun Bay
- Figure 2-12: Dixon - RCP Comparison



Risk Assessment Matrix Definitions

PROBABILITY RATING

The likelihood of a hazard event occurring within a time period?

PROBABILITY	Highly Likely	Highly likely - 100% annual probability. Or likely to occur every year in your lifetime.
	Likely	Likely - Between 10 and 100% annual probability. Or will occur several times in your lifetime.
	Possible	Possible - Between 1 and 10% annual probability. Or likely to occur some time in your lifetime.
	Unlikely	Unlikely - Less than 1% annual probability. Or unlikely but possible to occur in your lifetime.

IMPACT RATING

In terms of injuries, damage, or death, would you anticipate impacts to be minor, limited, critical, or catastrophic when a significant hazard event occurs? The impact could be in terms of one hazard event (flooding from a culvert failure) or a large-scale event (multiple rivers flooding) in the same jurisdictional boundary.

IMPACT			
Minor	Limited	Critical	Catastrophic
Minor - Very few injuries, if any. Only minor property damage and minimal disruption on quality of life. Temporary shutdown of critical facilities.	Limited - Minor injuries only. Approx. 10% or less of property in disaster footprint damaged or destroyed. Complete shutdown of critical facilities for more than one day.	Critical - Multiple deaths/injuries possible. Between 25% and 50% of property in disaster footprint is damaged or destroyed. Complete shutdown of critical facilities for more than one week.	Catastrophic - High number of deaths/injuries possible. More than 50% of property in affected area damaged or destroyed. Complete shutdown of critical facilities for 30 days or more.

To concentrate resources on highest priority hazards, the jurisdictional planning team will focus on "High" and "Extreme" risk hazards in this annex. These hazards have higher probability and greater impact as it relates to the jurisdiction's planning area.

Hazard definitions are included in Vol. 1 of this plan.

Hazard Information / Legend:



Climate Change is prioritized for all jurisdictions.

Sea-Level Rise is a subhazard of climate change for some jurisdictions (County, Vallejo, Benicia, Suisun City, Fairfield).



Extreme Weather in Solano County includes high heat, high wind, and heavy rain.



If a hazard symbol is grey, the planning team did not develop hazard vulnerability information due to lower perceived probability and impact.

City Of Dixon Risk Matrix

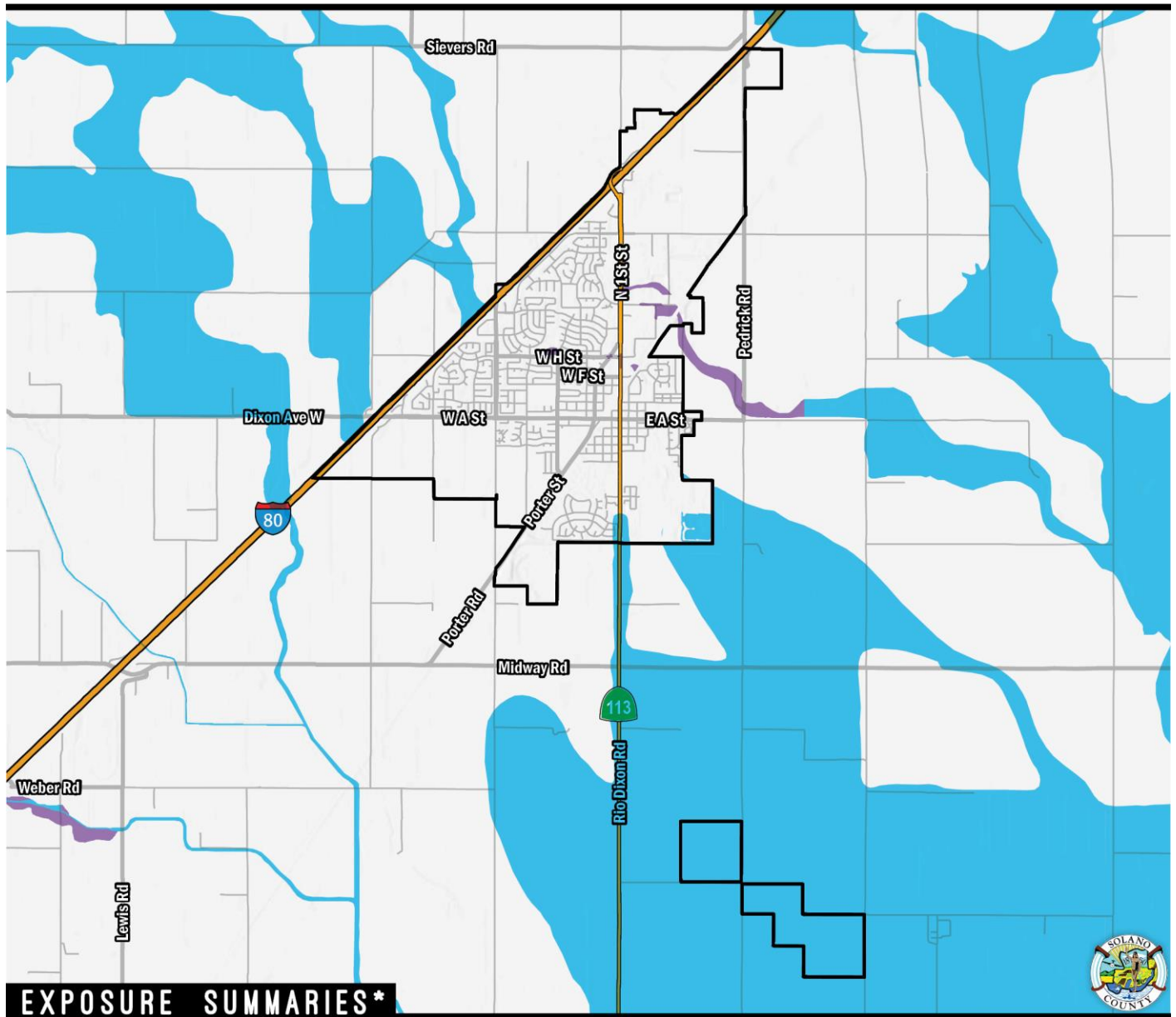
		IMPACT			
		Minor	Limited	Critical	Catastrophic
PROBABILITY	Highly Likely	Medium 	Extreme 	Extreme	Extreme
	Likely	Medium 	High 	High	Extreme
	Possible	Low 	Medium 	High 	High
	Unlikely	Low 	Low	Medium	Medium

Figure 2-2: City of Dixon Risk Assessment



FEMA FLOOD RISK EXPOSURE

DIXON



EXPOSURE SUMMARIES*

POPULATION COUNT IN HAZARD AREA		PARCEL COUNT IN HAZARD AREA		PARCEL VALUE IN HAZARD AREA		CRITICAL INFRASTRUCTURE COUNTS IN HAZARD AREA			
Count	Exp. Rate**	Count	Exp. Rate**	Sum of Improvement Value	Exp. Rate**	Infrastructure Category	Count	Exp. Rate**	Count/Sum Includes:
199	1%	52	1%	\$38,317,843	1%	Essential Facilities	0	0%	100 + 500
Count Includes: 100 + 500		Count Includes: 100 + 500		\$29,860,515	1%	High Potential Loss	28	14%	Sum of Transportation & Lifeline Linear Mileage
				Count Includes: 100 + 500		Transportation & Lifeline	0	0%	5 4%

MAP LEGEND

- 100-YR (Blue)
- COASTAL (Pink)
- AREA PROTECTED BY LEVEE (Yellow)
- 500-YR (Purple)

*Exposure summaries include 100-year and 500-year flood zone areas, including coastal and leveed areas. Hazard data source: FEMA.
 **Exposure Rate - Exposed summary or count as a percentage of total summary or count within jurisdiction.

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Figure 2-3: Dixon - FEMA Flood Risk Exposure



Table 2-4: Dixon - Damage Estimate Summaries, 100 YR Flood

Building Type	Building Damage (\$)	Building Damage (% of total loss)	Content Damage (\$)	Content Damage (% of total loss)	Total Damage (\$)	Proportion of Loss (%)
Agriculture	\$0	0.0%	\$0	0.0%	\$0	0%
Commercial	\$0	0.0%	\$0	0.0%	\$0	0%
Education*	\$0	0.0%	\$0	0.0%	\$0	0%
Emergency	\$0	0.0%	\$0	0.0%	\$0	0%
Government	\$0	0.0%	\$0	0.0%	\$0	0%
Industrial	\$0	0.0%	\$0	0.0%	\$0	0%
Religion	\$0	0.0%	\$0	0.0%	\$0	0%
Residential	\$106,811	74.8%	\$36,057	25.2%	\$142,868	100%
Total	\$106,811	75%	\$36,057	25%	\$142,868	

*School district asset information not available during time of Hazus analysis.

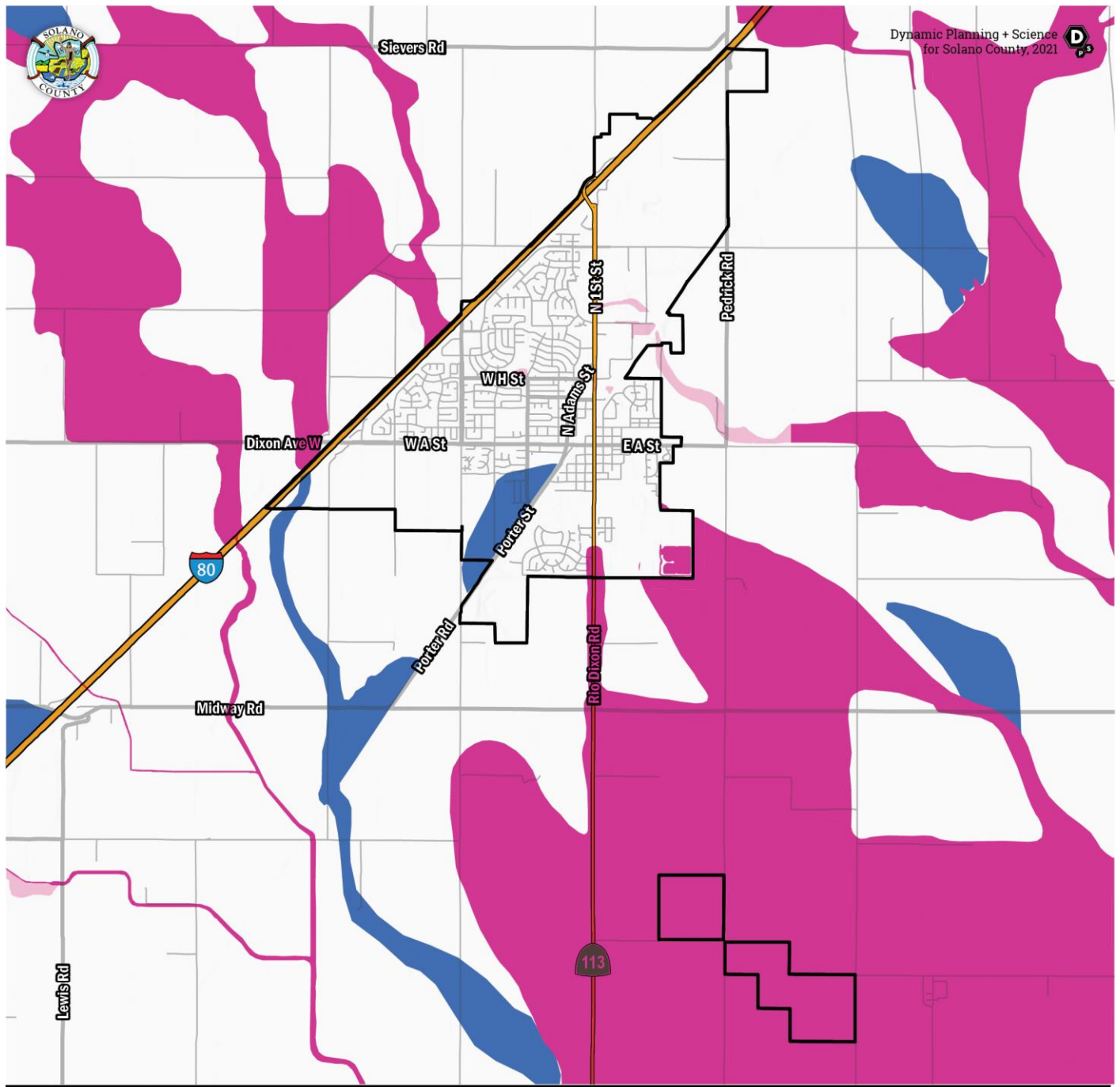
Note: Total Inventory Values

1 - Building Replacement Costs = \$3,773,922,295

2 - Content Replacement Costs = \$2,667,166,517

3 - Total Value = \$6,441,088,812





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BAM 200-YR FLOODING AND AWARENESS ZONES DIXON

*Data sources: DWR.

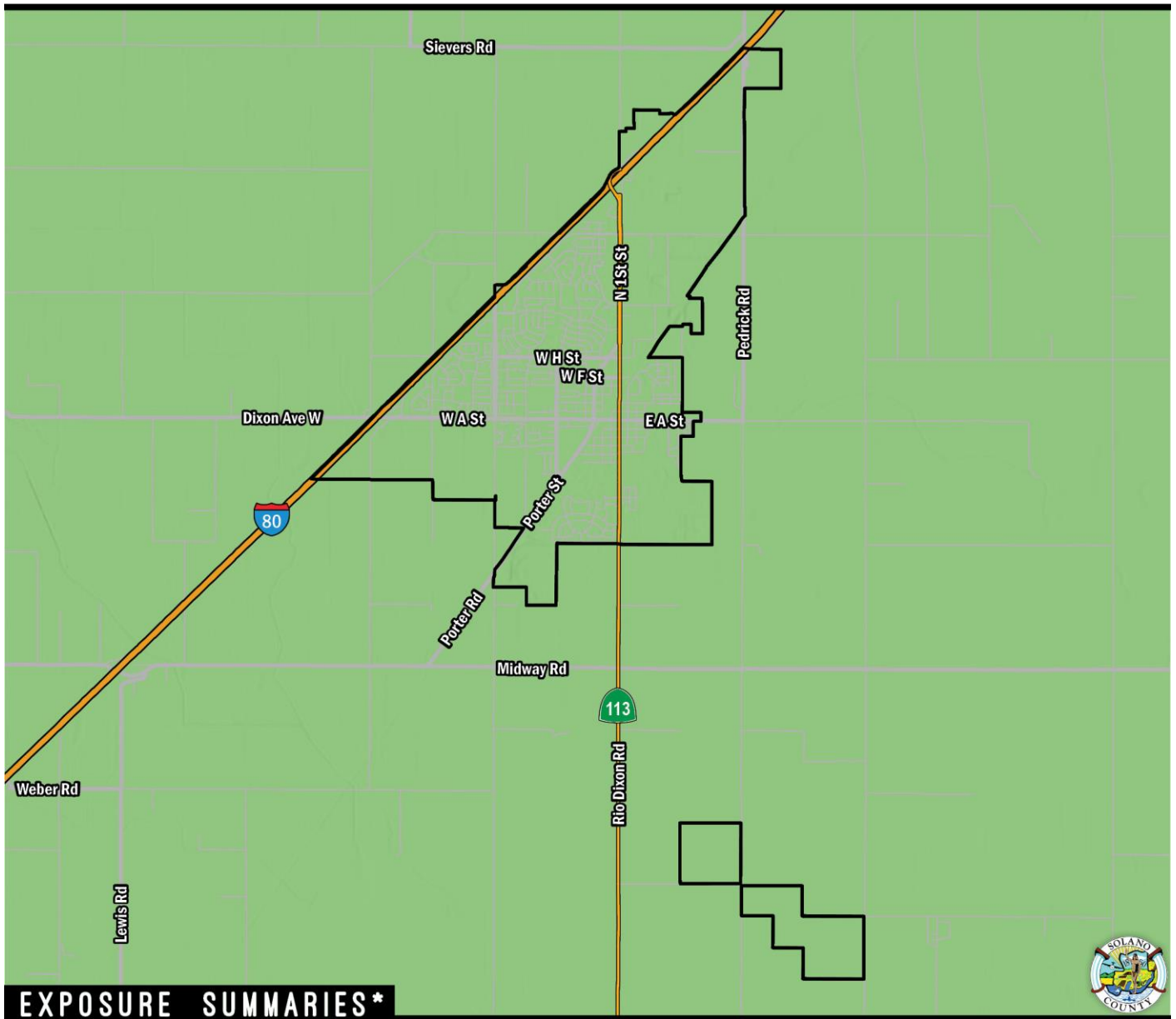
FEMA FLOOD ZONES		DWR AWARENESS ZONES
100-YR (SFHA)	500-YR	
USACE SAC. SAN JOAQUIN R. COMPREHENSIVE STUDY		
100-YR	200-YR	500-YR

Figure 2-4: Dixon - BAM 200-YR Flooding and Awareness Zones



HAYWARD-RODGER'S CREEK EARTHQUAKE SCENARIO (M7.1)

DIXON



EXPOSURE SUMMARIES*

POPULATION COUNT
IN HAZARD AREA

Count	Exp. Rate**
0	0%
Count Includes: S+++E	

PARCEL COUNT
IN HAZARD AREA

Count	Exp. Rate**
0	0%
Count Includes: S+++E	

PARCEL VALUE
IN HAZARD AREA

Sum of Improvement Value	Exp. Rate**
\$0	0%
Sum of Content Value	0%
\$0	S+++E
Count Includes:	

CRITICAL INFRASTRUCTURE COUNTS
IN HAZARD AREA

Infrastructure Category	Count	Exp. Rate**	Count/Sum Includes:
Essential Facilities	0	0%	S+++E
High Potential Loss	0	0%	
Transportation & Lifeline	0	0%	0 0%

Sum of Transportation & Lifeline Linear Mileage

MAP LEGEND



*Exposure summaries include strong, very strong, violent, and severe MMI classes.
Hazard data source: USGS.

**Exposure Rate - Exposed summary or count as a percentage of total summary or count within jurisdiction.

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Figure 2-5: Dixon - Hayward Rodger's Creek EQ Scenario (M7.1)



Table 2-5: Dixon - Hayward Roger's Creek Damage Estimation Summaries

Building Type	Average of Potential Damage to Exceed "Slight"	Average of Potential Damage to Exceed "Moderate"	Average of Potential Damage to Exceed "Extensive"	Average Economic Loss for Each Building Category	Sum of Economic Loss	Proportion of Loss (%)
Agriculture	12%	4%	0%	\$5,291	\$10,583	0%
Commercial	5%	1%	0%	\$45,923	\$7,806,889	36%
Education*	12%	4%	0%	\$13,291	\$13,291	0%
Emergency	2%	0%	0%	\$8,466	\$25,397	0%
Government	4%	1%	0%	\$1,966	\$112,039	1%
Industrial	12%	4%	0%	\$71,411	\$4,498,869	21%
Religion	4%	0%	0%	\$3,208	\$32,085	0%
Residential	3%	0%	0%	\$1,695	\$9,071,995	42%
Total					\$21,571,146	

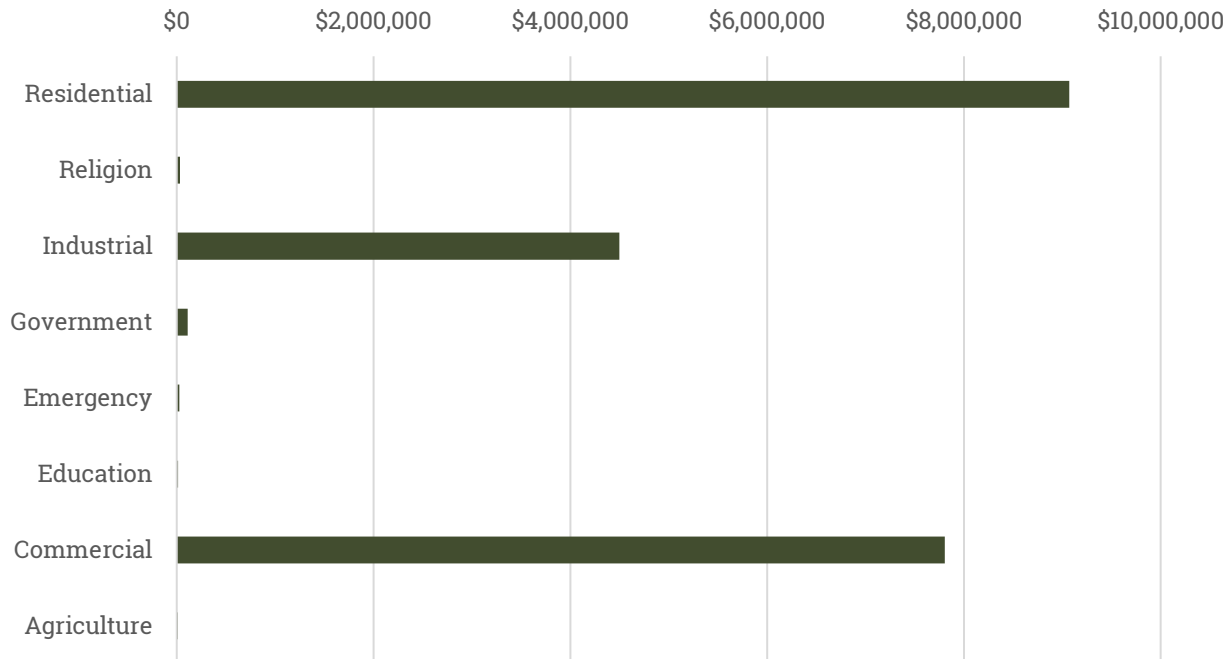
*School district asset information not available during time of Hazus analysis.

Note: Total Inventory Values

1 - Building Replacement Costs = \$3,773,922,295

2 - Content Replacement Costs = \$2,667,166,517

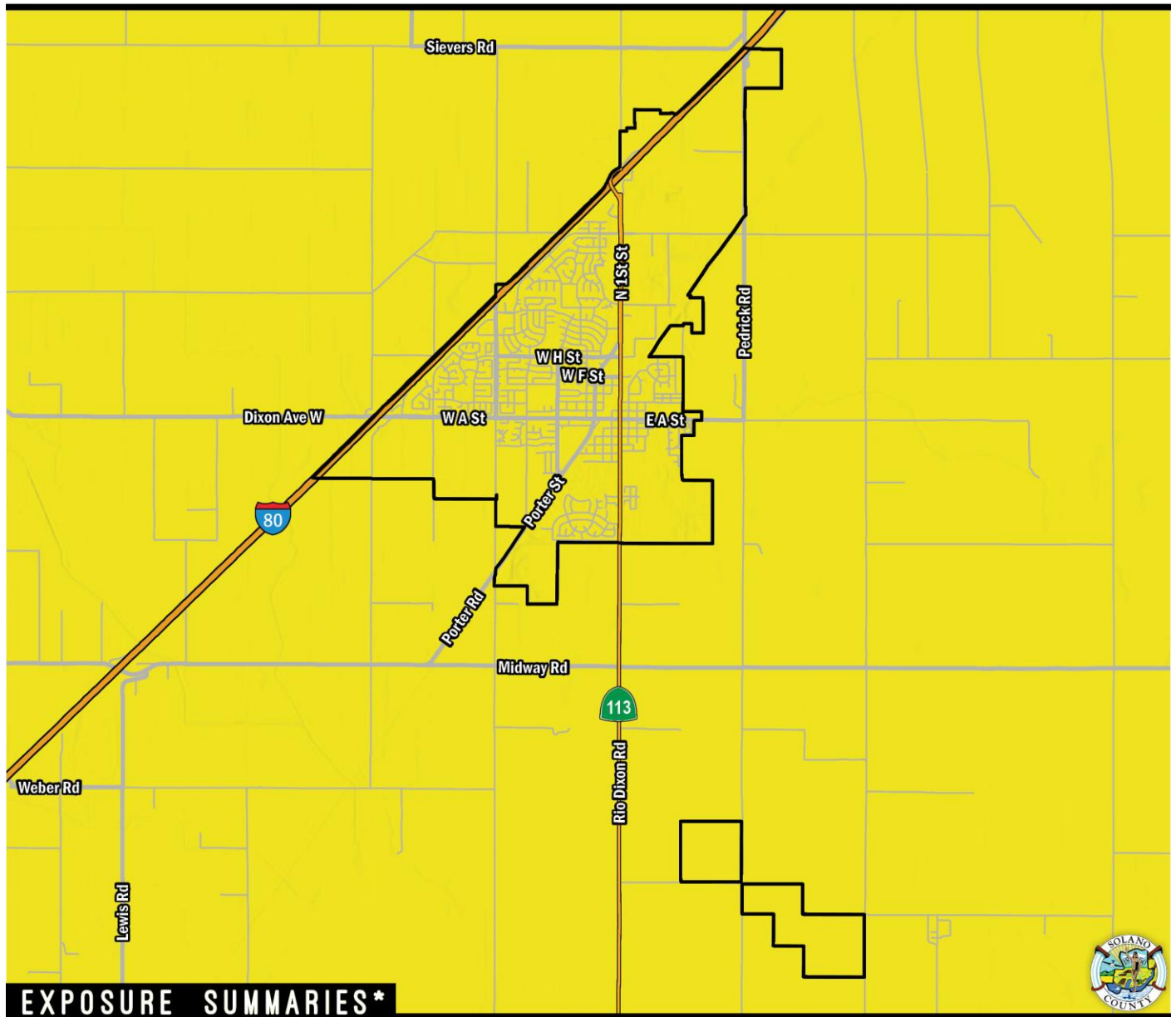
3 - Total Value = \$6,441,088,812





CONCORD-GREEN VALLEY EARTHQUAKE SCENARIO (M6.8)

DIXON



EXPOSURE SUMMARIES*

POPULATION COUNT
IN HAZARD AREA

Count	Exp. Rate**
19,759	100%
Count Includes: S+++E	

PARCEL COUNT
IN HAZARD AREA

Count	Exp. Rate**
5,610	100%
Count Includes: S+++E	

PARCEL VALUE
IN HAZARD AREA

Sum of Improvement Value	Exp. Rate**
\$3,436,676,008	100%
Sum of Content Value	
\$2,230,172,154	100%
Count Includes: S+++E	

CRITICAL INFRASTRUCTURE COUNTS
IN HAZARD AREA

Infrastructure Category	Count	Exp. Rate**	Count/Sum Includes:
Essential Facilities	2	100%	S+++E
High Potential Loss	206	100%	Sum of Transportation & Lifeline Linear Mileage
Transportation & Lifeline	9	100%	

MAP LEGEND

III	IV	V	VI	VII	VIII	IX	X
WEAK	LIGHT	MODERATE	STRONG	VERY STRONG	SEVERE	VIOLENT	EXTREME
MMI							

*Exposure summaries include strong, very strong, violent, and severe MMI classes. Hazard data source: USGS.

**Exposure Rate - Exposed summary or count as a percentage of total summary or count within jurisdiction.

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Figure 2-6: Dixon - Concord Green Valley EQ Scenario (M6.8)



Table 2-6: Dixon - Concord Green Valley Damage Estimate Summaries

Building Type	Average of Potential Damage to Exceed "Slight"	Average of Potential Damage to Exceed "Moderate"	Average of Potential Damage to Exceed "Extensive"	Average Economic Loss for Each Building Category	Sum of Economic Loss	Proportion of Loss (%)
Agriculture	27%	12%	2%	\$13,309	\$26,617	0%
Commercial	15%	4%	1%	\$136,066	\$23,131,297	35%
Education*	26%	11%	1%	\$33,656	\$33,656	0%
Emergency	6%	1%	0%	\$32,038	\$96,113	0%
Government	12%	2%	0%	\$6,354	\$362,185	1%
Industrial	29%	12%	2%	\$194,249	\$12,237,657	18%
Religion	11%	2%	0%	\$10,559	\$105,595	0%
Residential	10%	1%	0%	\$5,641	\$30,191,928	46%
Total					\$66,185,048	

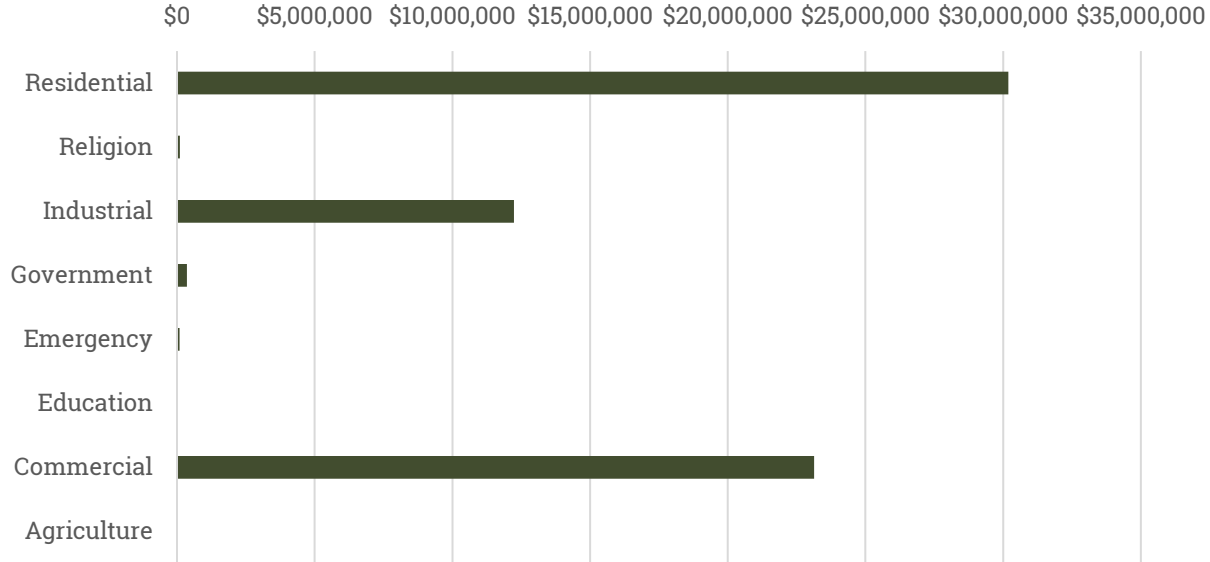
*School district asset information not available during time of Hazus analysis.

Note: Total Inventory Values

1 - Building Replacement Costs = \$3,773,922,295

2 - Content Replacement Costs = \$2,667,166,517

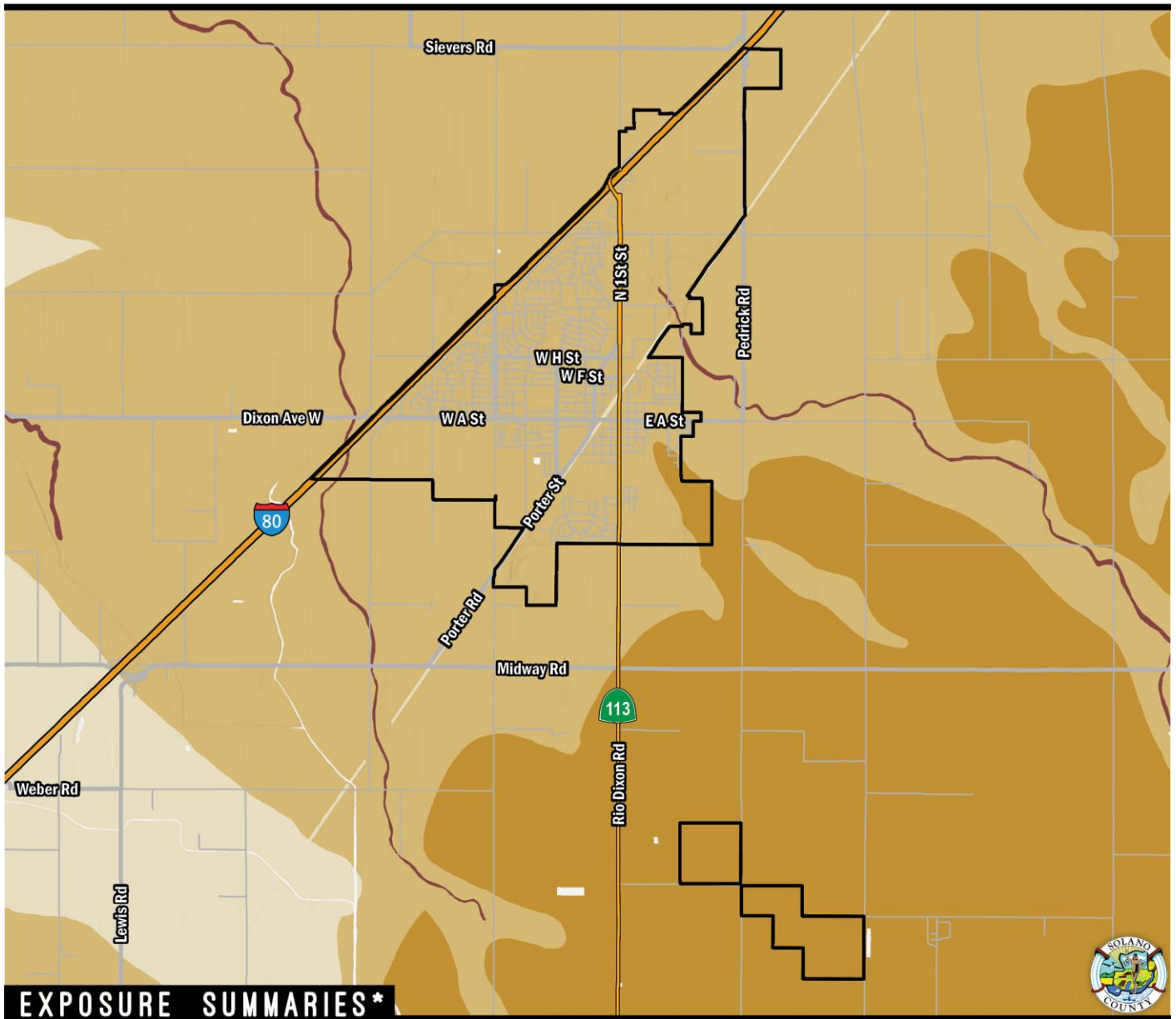
3 - Total Value = \$6,441,088,812





AREAS WITH POTENTIAL FOR LIQUEFACTION

DIXON



EXPOSURE SUMMARIES*

**POPULATION COUNT
IN HAZARD AREA**

Count	Exp. Rate**
19,339	98%
Count Includes:	M H VH

**PARCEL COUNT
IN HAZARD AREA**

Count	Exp. Rate**
5,609	100%
Count Includes:	M H VH

**PARCEL VALUE
IN HAZARD AREA**

Sum of Improvement Value	Exp. Rate**
\$3,436,418,008	100%
Sum of Content Value	Exp. Rate**
\$2,230,043,154	100%
Count Includes:	M H VH

**CRITICAL INFRASTRUCTURE COUNTS
IN HAZARD AREA**

Infrastructure Category	Count	Exp. Rate**	Count/Sum Includes:
Essential Facilities	2	100%	M H VH
High Potential Loss	205	100%	Sum of Transportation & Lifeline Linear Mileage
Transportation & Lifeline	9	100%	106 87%

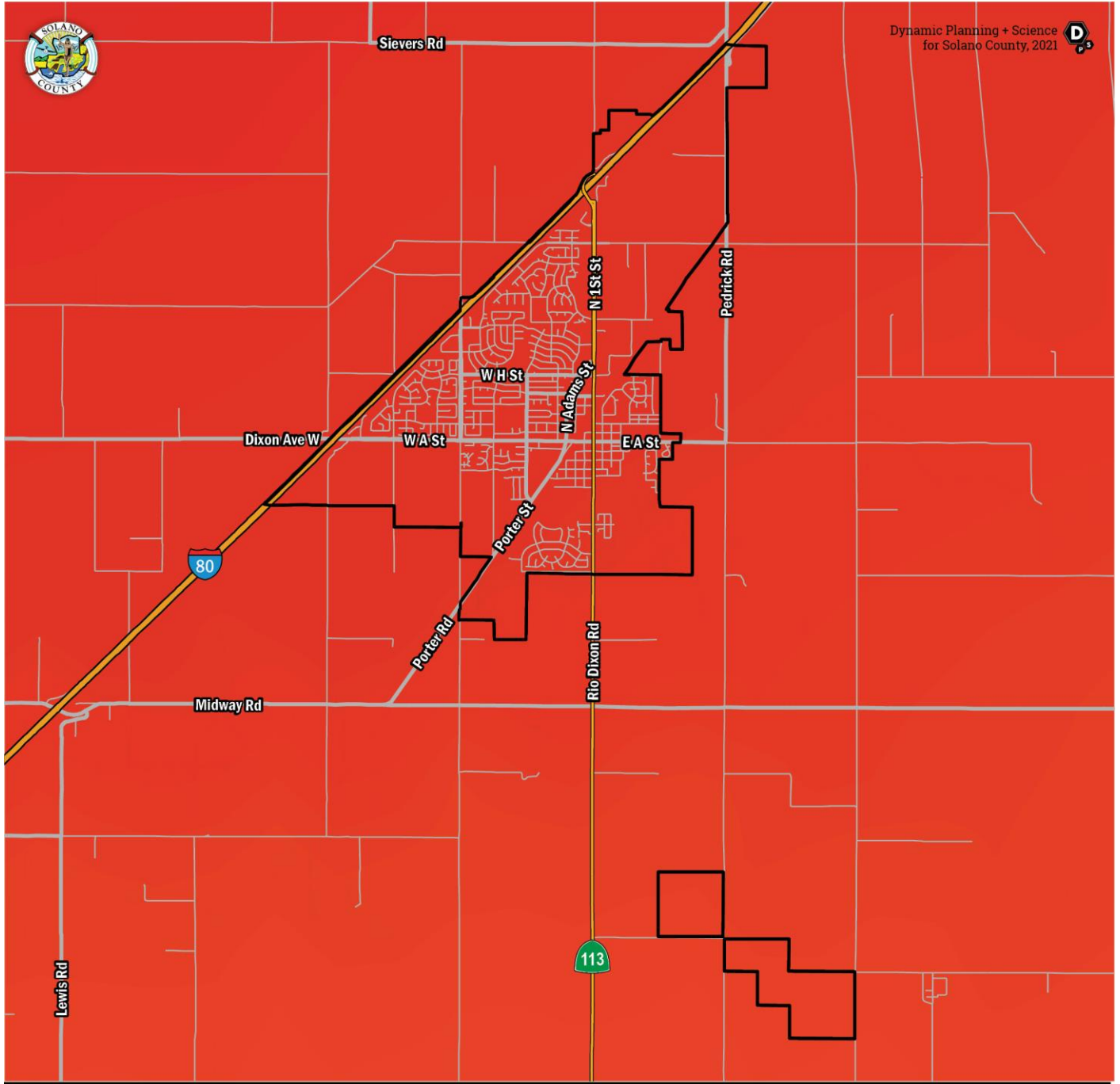


*Exposure summaries include medium, high, very high susceptibility. Hazard data source: USGS.

**Exposure Rate - Exposed summary or count as a percentage of total summary or count within jurisdiction.

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Figure 2-7: Dixon – Areas with Potential for Liquefaction



30-YR NORMAL MAXIMUM TEMPERATURE FOR JULY DIXON

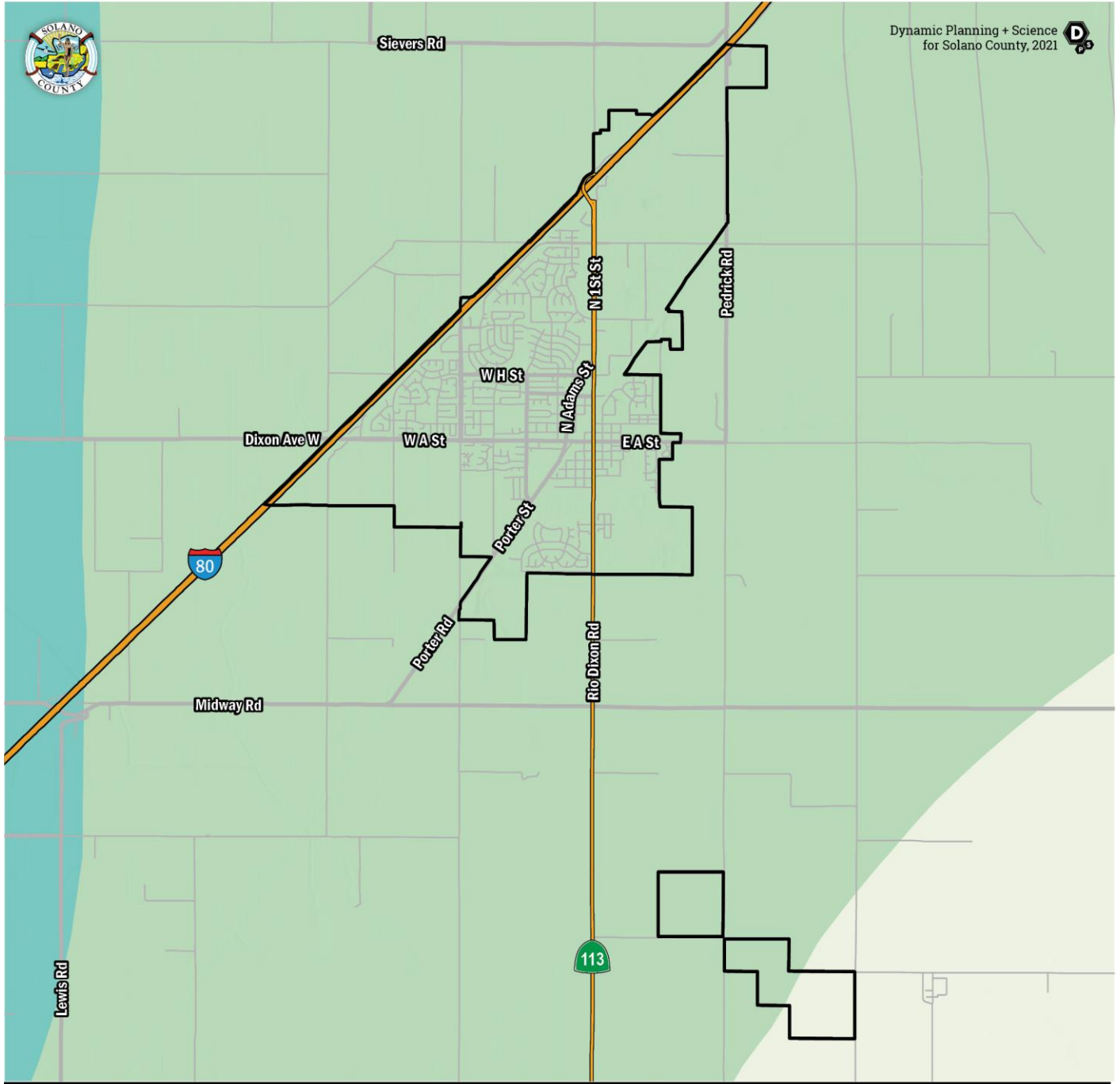
*Data sources: PRISM 800m Resolution 30-YR Normals.



Figure 2-8: Dixon - 30-YR Normal Maximum Temperature for July



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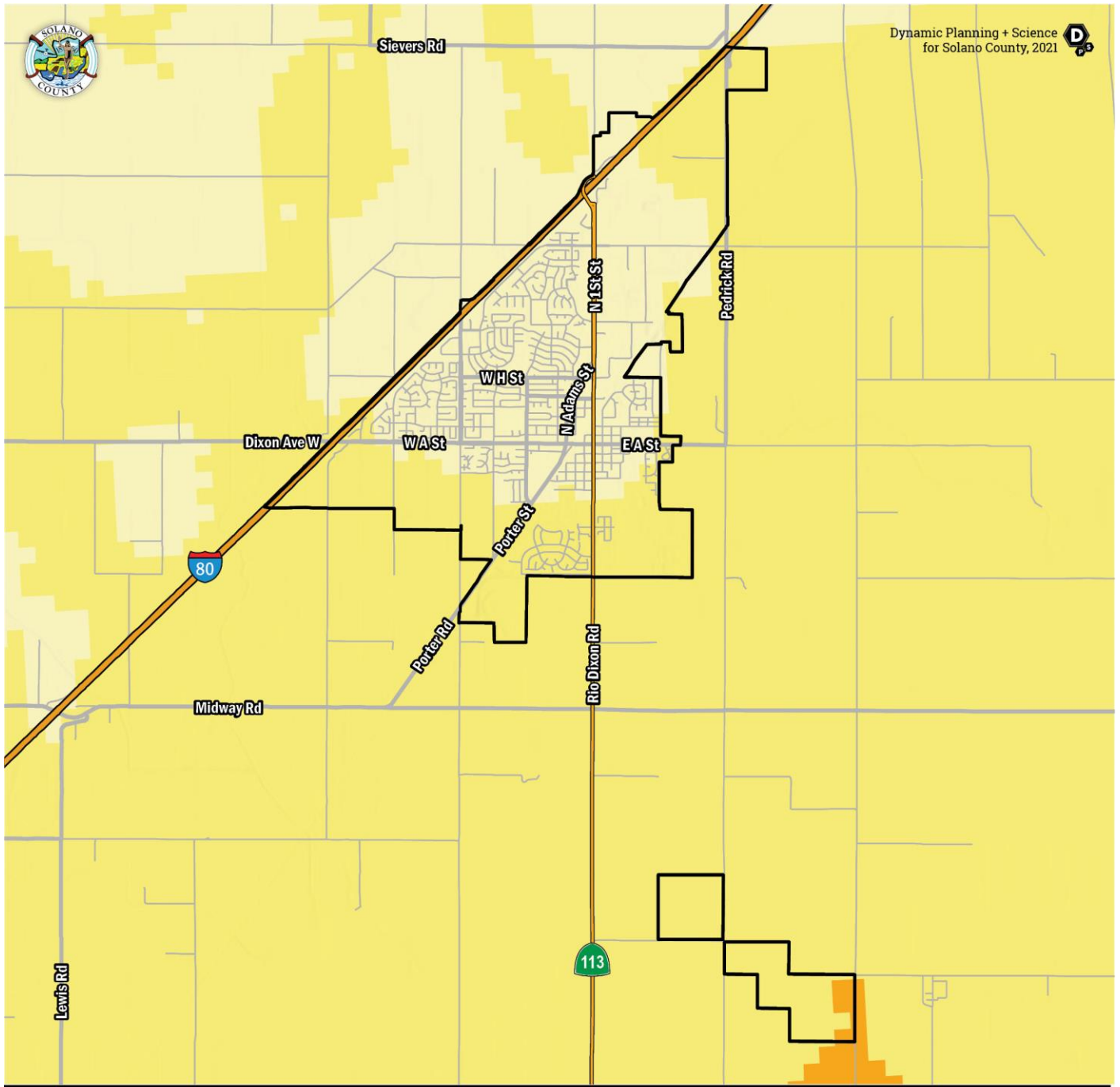


AVERAGE ANNUAL PRECIPITATION (1981-2010, INCHES) DIXON

*Data sources: USDA - 1981-2010 Annual Average Precipitation by State.



Figure 2-9: Dixon - Average Annual Precipitation (1981-2010)



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ANNUAL AVERAGE WIND SPEED (POWER CLASS) DIXON

*Data sources: NREL.



Figure 2-10: Dixon - Average Annual Wind Speed (Power Class)



Table 2-7: Dixon Drought Classifications and Impacts

Category	Description	Possible Impacts
D0	Abnormally Dry	<ul style="list-style-type: none"> Active fire season begins. Going into drought, short term dryness, slowing planting, growth of crops or pastures. Coming out of drought, some lingering water deficits and pasture or crops not fully recovered
D1	Moderate Drought	<ul style="list-style-type: none"> Some damage to crops, pastures. Streams, reservoirs, or wells low, some water shortages developing or imminent. Voluntary water-use restrictions requested
D2	Severe Drought	<ul style="list-style-type: none"> Crop or pasture losses likely Water shortages common Water restrictions imposed
D3	Extreme Drought	<ul style="list-style-type: none"> Major crop/ pasture losses Widespread water shortages or restrictions
D4	Exceptional Drought	<ul style="list-style-type: none"> Exceptional and widespread crop/ pasture losses Shortages of water in reservoirs, streams, and wells creating water

Adapted from U.S. Drought Monitor Drought Classifications and Impacts

Drought Severity Timeline

Suisun Bay

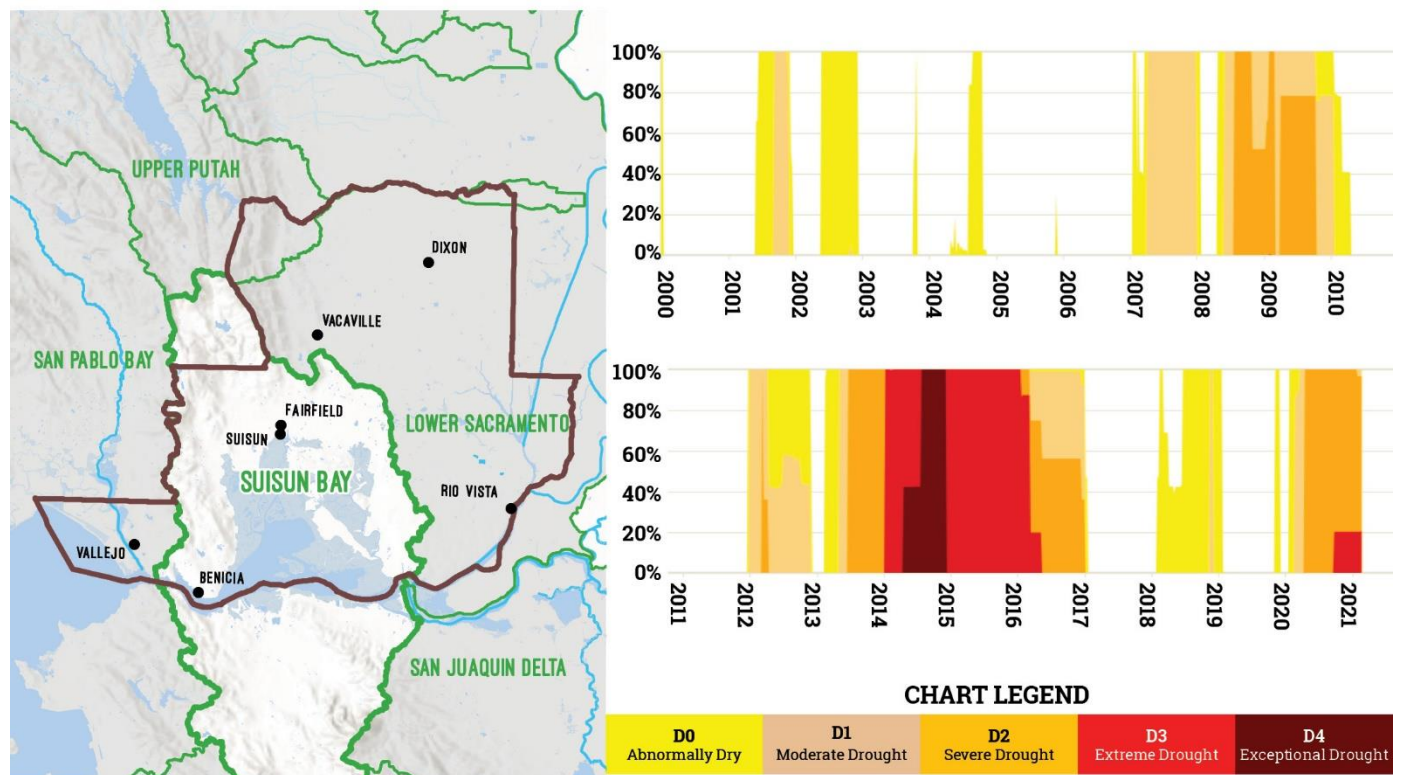


Figure 2-11: Drought Severity Timeline - Suisun Bay



DIXON

AVERAGE ANNUAL MAXIMUM TEMPERATURE

COMPARISON OF CURRENT OBSERVED TO RCP 4.5 AND RCP 8.5 SCENARIOS



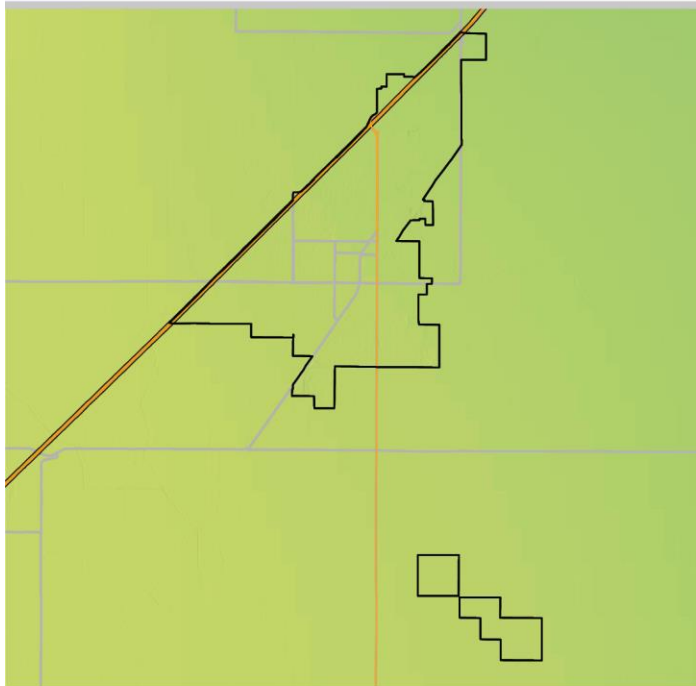
*Data sources: Cal-Adapt CanESM2 RCP 4.5 & 8.5, PRISM 30-YR Norms Annual Max Temp



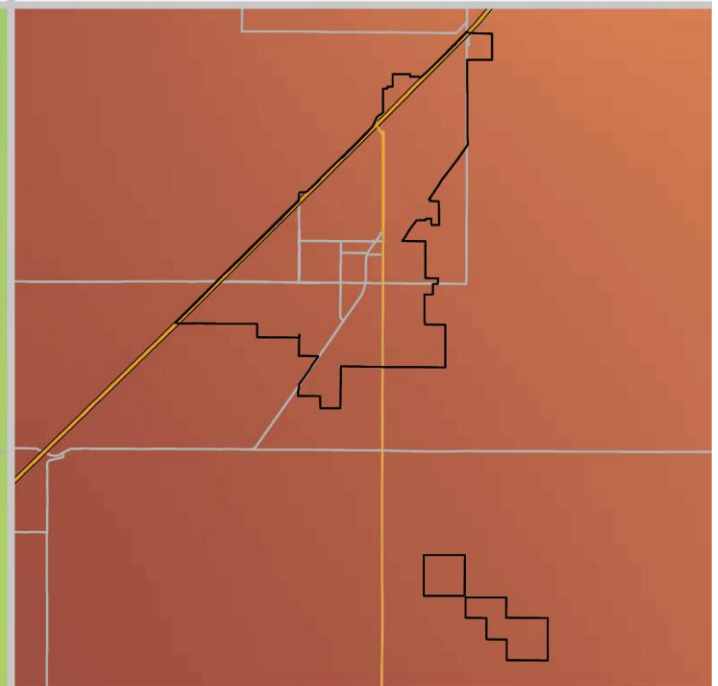
CURRENT 30-YR NORMAL



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RCP 4.5 YEAR 2100



RCP 8.5 YEAR 2100

Figure 2-12: Dixon - RCP Comparison



2.4.3.3 Past and Future Development

The City of Dixon is a general law city that crafts its own development regulations and is subject to State law. Future development is subject to compliance with state and local planning, zoning, subdivision, and architecture laws.

The City of Dixon's General Plan (GP) establishes long-range development policies. The GP is designed to help the City address issues related to land use, circulation (traffic), housing, open space, conservation, noise, and safety. The Land Use portion of the plan helps guide the City in determining the location of future development(s), including possible future annexation. In addition to the GP, the City has other plans that guide development in specific areas, including specific plans, policy plans, and master plans. These plans help to shape future development and dictate the City's Sphere of Influence (SOI). One of the central functions in these planning documents is to decrease risk of impact from natural hazards.

Development since Previous HMP

The City considered its growth since the last HMP and determined it had completed several significant mitigation activities and substantially decreased its vulnerability to hazards. In effort to respond to drought conditions, the City recently installed artificial turf fields and instituted subsidized desalination stations which reduce the need for salt filters to make water softer. The City of Dixon has also developed a dam emergency action plan for City-owned dam "Pond A," which has been submitted to CalOES. This HMP Annex reflects these substantial changes and focuses on avenues to better mitigate impacts from problematic past development.

Future Development

City of Dixon is required to update building codes to meet the minimum standards to those required in the California Building Code last updated in 2019. California Building Codes provide some of the safest construction standards in the world and are meant to reduce risk to occupants from high wind, seismic activity, landslides, flood, wildfire, and other natural hazards. In addition to California minimum development standards, all jurisdictions belong to the NFIP, and all development must meet minimum flood protection standards set forth by FEMA. See Section 4.3.5 of Volume 1 for more information about past and future development in Solano County.

As the General Plan is updated and incorporates information from this HMP, City of Dixon staff are continually improving hazard information through these hazard mitigation plan updates. With this 2020 update, improved online mapping about natural hazards available on RAMP will inform those responsible for future development to make better decisions where and how future development occurs.

City of Dixon reviewed its general plans under the capability assessments undertaken for this hazard mitigation plan. See Section 2.5.1. Deficiencies revealed by these reviews are identified as mitigation actions to decrease risks to move beyond past trends.



The City's municipal codes includes regulations to mitigate the impact of hazards on new and existing development, including:

- Drainage and stormwater retention requirements,
- Steep slope restrictions for new development,
- Waterbody buffer requirements,
- Floodplain management regulations,
- Zoning that prevents development in hazardous areas of the community such as floodplains, landslide areas, the wildland-urban interface (WUI), or other known hazard areas, and
- Building codes that include the most up-to-date California Fire Code, seismic standards, and many other provisions crafted to protect new construction from hazard events.

The City of Dixon is currently growing at a fast pace, specifically within two previously approved subdivisions at the south and southwest portions of the city. Future residential growth will continue in the southwest as well as vacant lands on the southwest and eastern parts of the city. Future industrial and commercial growth will focus on the northeast portions of the city and along the interstate, along with infill and redevelopment within developed parts of the city.

With the recent adoption of the general plan 2040 on May 18, 2021, the City will next embark on two major planning initiatives. The first will include updating the Housing Element for the next housing cycle of 2023-2031. This is due to be completed by 2023. Additionally, the City will update the outdated Zoning Ordinance and Zoning Map, Funds were requested as part of the 2021-22 budget and recently approved. The updated Zoning Ordinance will review and modernize the City's zoning and development standards

Even in the event that limited development did occur within a hazard area, the municipal code should ensure impacts from a hazard event are mitigated and losses are minimal. If development does occur in hazard areas, evacuation and emergency planning should take into consideration the anticipated local impacts of the hazard event, including potential interrupted services or the elimination of access.

The anticipated growth in the City will not cause significant change in vulnerability to the City for identified priority hazards.



National Flood Insurance Program (NFIP)

The NFIP makes federally backed flood insurance available to homeowners, renters, and business owners in participating communities. FEMA has prepared a detailed Flood Insurance Study (FIS) for Solano County and municipalities. The study presents water surface elevations for floods of various magnitudes, including the 1-percent annual chance flood and the 0.2-percent annual chance flood (the 500-YR flood). Base flood elevations and the boundaries of the 100- and 500-YR floodplains are shown on Flood Insurance Rate Maps (FIRMs), which are the principal tools for identifying the extent and location of the flood hazard. FIRMs are the most detailed and consistent data source available, and for many communities they represent the minimum area of oversight under their floodplain management program. See Section 4 of Volume 1 for general information on the NFIP.

The City of Dixon has participated in the NFIP since 1981. The City of Dixon is currently in good standing with the provisions of the NFIP. Compliance is monitored by FEMA regional staff and by the California Department of Water Resources under a contract with FEMA. Maintaining compliance under the NFIP is an important component of flood risk reduction. See Table 2-8 for more information on the City’s policies and historic flood insurance claims.

Table 2-8: NFIP Status Table

NFIP and CRS Status & Information	
City of Dixon	
NFIP Status	05/19/81
CRS Class	-
Policies in Force	20
Policies in SFHA	2
Policies in non-SFHA	18
Total Claims Paid	\$3,342
Paid Losses	7
Repetitive Loss Properties	1
Severe Repetitive Loss Properties	-
Repetitive Loss Payment by NFIP on Building	\$10,488
Repetitive Loss Payment by NFIP on Contents	\$0

Source: FEMA CIS 2021, OpenFEMA Data, FIMA RUL Solano County

Note: Policies and claims provided directly from FEMA Region IX CIS Report (8/2021). Repetitive loss tabulations by jurisdiction derived via GIS-based intersect of data available at OpenFEMA Data (<https://www.fema.gov/about/openfema/data-sets>). Countywide data reported for entire county area including municipalities. The Privacy Act of 1974 (5 U.S.C. 522a) restricts the release of certain types of data to the public. Flood insurance policy and claims data are included in the list of restricted information. FEMA can only release such data to state and local governments, and only if the data are used for floodplain management, mitigation, or research purposes. Therefore, this plan does not identify the repetitive loss properties or include claims data for any individual property.

See Volume 1, Section 4.5 for more information on the NFIP



2.4.3.4 Identify Hazard Problem Statements

As part of the mitigation action identification process, the Planning Committee for each jurisdiction identified areas of concern (aka problem statements) for their respective facilities based on the risk assessment and vulnerability analysis, utilizing the RAMP mapping and static snapshot maps. Problem statements focused on the impact, victim, or threat that the hazard could create in the jurisdiction, as described in Figure 2-13. Identifying common issues and weaknesses through these problem statements assisted the Planning Committee in understanding the realm of resources needed for mitigation. Jurisdiction problem statements are listed in Table 2-9.

The goal is to have at least one mitigation action for every problem statement. Projects or actions have been developed to mitigate each problem identified. See Table 2-14 for a full list of mitigation actions and corresponding problem statements that they address. Each problem statement is coded with a problem number for cross-referencing between Table 2-9 and Table 2-14.



Figure 2-13: Guidance for Problem Statements



Table 2-9: Problem Statements

Problem No.	Hazard Type	Area of Concern	Mitigation Alternatives	Primary Agency	Problem Description	Related MA
ps-AH-DX-149	All Hazard	Impact	PRV - Prevention, PE&A - Public Education & Awareness, ES - Emergency Services	City of Dixon	If the jurisdiction's railway were damaged, the city would not have access to the interstate.	ma-AH-DX-116
ps-AH-DX-150	All Hazard	Victim	PE&A - Public Education & Awareness, ES - Emergency Services	City of Dixon	Dixon needs a secondary alerting system to notify community of impending incidents.	ma-AH-DX-117
ps-EQ-DX-151	Earthquake	Impact	PPRO - Property Protection, PE&A - Public Education & Awareness, NRP - Natural Resource Protection, SP - Structural Projects	City of Dixon	Earthquakes can cause major damage to the jurisdiction causing liquefaction throughout the city.	ma-EQ-DX-119
ps-EQ-DX-152	Earthquake	Impact	PRV - Prevention, PPRO - Property Protection, SP - Structural Projects	City of Dixon	Many city facilities, constructed in 1978 including city administration buildings, need retrofits.	ma-EQ-DX-120
ps-EQ-DX-153	Earthquake	Impact	PRV - Prevention, PPRO - Property Protection, SP - Structural Projects	City of Dixon	Most of the City's water is produced from wells, however if pumps are damaged during an earthquake, this may cause major water supply issues.	ma-EQ-DX-121
ps-EQ-DX-154	Earthquake	Impact	PRV - Prevention, PE&A - Public Education & Awareness	City of Dixon	Dixon has several petroleum transmission (PGE) lines running through jurisdiction, mostly natural gas, which presents the potential for gas leaks throughout the town.	ma-EQ-DX-122
ps-EQ-DX-155	Earthquake	Impact	PRV - Prevention, SP - Structural Projects	City of Dixon	Sewer lines are vitrified clay pipes, there is potential for failure when shaking.	ma-EQ-DX-123
ps-FL-DX-156	Flood	Impact	PRV - Prevention, PE&A - Public Education & Awareness	City of Dixon	Sandbagging is required annually to address flooding.	ma-FL-DX-126, ma-FL-DX-186
ps-DR-DX-157	Drought	Impact	PE&A - Public Education & Awareness	City of Dixon	There is not enough public outreach to educate the community about drought and drought impacts.	ma-DR-DX-118
ps-EW-DX-158	Extreme Weather	Impact	PRV - Prevention, PPRO - Property Protection, PE&A - Public Education & Awareness, ES - Emergency Services	City of Dixon	70 mile per hour wind gusts have become more frequent presenting potential damage opportunity to infrastructure and increased susceptibility to damaging wildland fires.	ma-EW-DX-124



Problem No.	Hazard Type	Area of Concern	Mitigation Alternatives	Primary Agency	Problem Description	Related MA
ps-EW-DX-159	Extreme Weather	Impact	PE&A - Public Education & Awareness, ES - Emergency Services	City of Dixon	The city lacks a documentation system and additional resources to document recurring heavy rain events, causing flooding.	ma-EW-DX-179
ps-EW-DX-160	Extreme Weather	Impact	PE&A - Public Education & Awareness, ES - Emergency Services	City of Dixon	Need for more generators throughout the jurisdiction for cooling centers.	ma-EW-DX-125
ps-CC-DX-180	Climate Change	Impact	PRV - Prevention, PPRO - Property Protection, SP - Structural Projects	City of Dixon	Climate change is predicted to increase the intensity of storms, drought, flooding, and wildfire.	ma-FL-DX-126; ma-CC-DX-215

2.4.4 Mitigation Action Support Tool (MAST)

As a living document, hazard problem statements and mitigation activities will be updated through a web interface application developed specifically for participating jurisdictions. The Mitigation Action Support Tool (MAST) is accessible through mitigatehazards.com/SolanoHMP/.

MAST is a web-based interactive tool that enables multiple users to search, view, enter, and update mitigation actions, ideas or projects, and other information. MAST provides participating jurisdictions and plan reviewers (Cal OES/FEMA) access to valuable mitigation information that can be leveraged by future planning or other risk reduction efforts within the County. Participating jurisdictions can update the status of their mitigation projects throughout the planning lifecycle, and this web-based tool will improve participating jurisdiction’s ability to apply for FEMA’s Hazard Mitigation Assistance (HMA) grant programs including initial grant application processes through Cal OES.



2.5 Mitigation Strategy

The mitigation strategy is the guidebook to future hazard mitigation administration, capturing the key outcomes of the MJHMP planning process. The mitigation strategy is intended to reduce vulnerabilities outlined in the previous section (a.k.a. problem statements) with a prescription of policies and physical projects. These mitigation actions should be compatible with existing planning mechanisms and should outline specific roles and resources for implementation success.

2.5.1 Capabilities & Adaptive Capacity Assessment

This section examines the planning and regulatory, administrative, technical, financial, educational, and outreach capabilities to augment known issues and weaknesses from identified natural hazards.

Capabilities assessments in this Volume 1 and in Volume 2 include considerations of a community's adaptive capacity for climate change, as outlined in Cal OES' 2020 California Adaptation Planning Guide. Adaptive capacity is a community or region's existing ability to moderate climate change impacts. Assessing adaptive capacity includes analysis of policies, plans, programs, funding, and staffing capacity.

The tables in this section explore various local planning mechanisms, administrative capacity, financial capabilities, and education and outreach initiatives. The columns in each table represent deeper dives into the following questions:

- Is the existing planning or regulatory mechanism used currently? (Column 1, Status)
- Has the HMP been integrated into the planning mechanism currently so that the named mechanism is currently used in HMP planning? (Column 2, Current Mitigation Use)
- Is there a future opportunity to expand, improve upon, and incorporate this 2020 HMP Update into the planning or regulatory mechanism? (Column 3, Future Opportunity)

The capabilities assessment is easily digestible and based on color coding to indicate which policies and plans are adequate, need improvement or in which the HMP could be integrated. Each table includes a legend that explain how each one of these questions are being answered according to the color indicated: green, yellow, and orange.

For more information on the regulatory environment surrounding each hazard, see hazard-specific sections of Volume 1. Volume 1, Section 5.3.5 includes an extensive list of federal and state funding opportunities as well.



2.5.1.1 Planning and Regulatory Capabilities

Table 2-10: Planning and Regulatory Capabilities

CAPABILITY ASSESSMENT LEGEND		
Status	Current Mitigation Use	Future Opportunity
Currently in use or present.	Used widely for mitigation.	Opportunity to expand and integrate.
(Sort of) Seldomly used or limited presence.	Limited use in mitigation planning.	Limited opportunity to expand and integrate.
(No) Not present or available.	Not used in mitigation planning.	No opportunity to expand or integrate.

Resource	HMP Integration			Notes / Additional Detail
	Status	Current Mitigation Use	Future Opportunity	
Planning and Regulatory Capabilities				
Construction and Future Development Regulations				
Building Codes				2019 California Building Code
Building Code Effectiveness Grading Schedule (BCEGS) Rating	N/A	N/A	N/A	Unknown
Public Protection (ISO Class)				3
Hazard Related Development Standards				Flood Damage Prevention (9.04)
Hazard-Specific Ordinance				Flood Damage Prevention (9.04); Fire Code, Means of Egress (Chapter 10); Water efficient landscaping (14.02.275)
Zoning Ordinance				
Growth Management Ordinance				Measure B Residential Growth Implementation Plan (18.48).
Hazard Reduction Programs (Annually Conducted)				
Capital Improvements Program (CIP) or Plan				2017/18-2021/22.Capital Improvement Plan
Erosion/Sediment Control Program				
Hazard-Related Public Outreach Program				See Education & Outreach Capabilities for more specifics.
Stormwater Management Program (Annual Inspections)				
Seismic Safety Program (Non-structural Inspections)				
Earthquake Modernization Program (Building Safety Inspections)				
Hazard Plans				
General Plan Safety Element				1993, currently being updated
Noteworthy Area/ Specific Plan with Hazard Focus	N/A	N/A	N/A	



Resource	HMP Integration			Notes / Additional Detail
	Status	Current Mitigation Use	Future Opportunity	
Planning and Regulatory Capabilities				
Community Wildfire Protection Plan (CWPP)		N/A	N/A	
Wildfire Vulnerability Assessment	N/A	N/A	N/A	
Urban or Integrated Regional Water Management Plan				Cal Water Service, Dixon Area, 2015
Floodplain Management Plan				See UWMP
Stormwater Management Plan				Stormwater Management Plan fiscal years 2003/4-2007/8
Ground Water Management Plan(s)				Solano County Groundwater Sustainability Plan in development
Open Space and Land Management Plan(s)				
Emergency Operations Plan				2014 City of Dixon Emergency Operations Plan
Climate Action Plan, Vulnerability Ass'mt, or Adaptation Plan				2011 County of Solano Climate Action Plan
Sustainable Community Plan (SB 375)				ABAG Plan Bay Area 2040 (2017)
Local Delta/ Wetlands Program(s)	N/A	N/A	N/A	
Downtown Plan with hazard focus	N/A	N/A	N/A	
Community Health Assessment(s)	N/A	N/A	N/A	Solano County Health Assessment
National Flood Protection Program (NFIP)				
Floodplain Management Regulations				Methods of Reducing Flood Losses (9.04.040)
Flood Insurance Education and Technical Assist.				2013 Flood Insurance Study
Flood Hazard Mapping / Re-Mapping				FEMA Flood Insurance Rate Map 2009
Community Rating System (CRS)				



2.5.1.2 Administrative and Technical Capabilities

Table 2-11: Administrative and Technical Capabilities

CAPABILITY ASSESSMENT LEGEND		
Status	Current Mitigation Use	Future Opportunity
Currently in use or present.	Used widely for mitigation.	Opportunity to expand and integrate.
(Sort of) Seldomly used or limited presence.	Limited use in mitigation planning.	Limited opportunity to expand and integrate.
(No) Not present or available.	Not used in mitigation planning.	No opportunity to expand or integrate.

Resource	HMP Integration			Notes / Additional Detail
	Status	Current Mitigation Use	Future Opportunity	
Administrative and Technical				
Community Planning and Development Services				
Community Planner				Associate Planner, Scott Greeley
Civil Engineer				Public Works Director/City Engineer Joe Leach
Building Code Official				Building inspector II, Joel Engrahm
Floodplain Administrator				Deputy Public Works Director, Louren Kotow
Fire Marshall				Fire Chief, Greg Lewis
Dedicated Public Outreach Personnel				
GIS Specialist and Capability				
Emergency Manager				
Grant Manager, Writer, or Specialist				
Other				
Warning Systems/Services				
General				AlertSolano
Flood				AlertSolano: Flood Risk: California Department of Water Resources Flood Risk Notification Program Flood Control: Solano County Water Agency
Wildfire				AlertSolano
Geological Hazards				AlertSolano ShakeAlert.org (nation-wide)



2.5.1.3 Financial Capabilities

Table 2-12: Financial Capabilities

CAPABILITY ASSESSMENT LEGEND		
Status	Current Mitigation Use	Future Opportunity
Currently in use or present.	Used widely for mitigation.	Opportunity to expand and integrate.
(Sort of) Seldomly used or limited presence.	Limited use in mitigation planning.	Limited opportunity to expand and integrate.
(No) Not present or available.	Not used in mitigation planning.	No opportunity to expand or integrate.

Resource	HMP Integration			Notes / Additional Detail
	Status	Current Mitigation Use	Future Opportunity	
Fiscal Capabilities				
Financial Resources for Hazard Mitigation				
Levy for Specific Purposes with Voter Approval				While the City has employed these various financial capabilities to varying degrees, there are no examples of employing them for hazard mitigation projects or planning. However, it's not anticipated that many of these would be used to fund hazard mitigation projects in the future, either, unless paired with other grant funding.
Utilities Fees				
Benefit assessments				
System Development Fee				
Various Bonds to Incur Debt				
Withheld Spending in Hazard-Prone Areas	N/A	N/A	N/A	
Stormwater Service Fees				
Capital Improvement Project Funding				



2.5.1.4 Education and Outreach

Table 2-13: Education and Outreach Capabilities

CAPABILITY ASSESSMENT LEGEND		
Status	Current Mitigation Use	Future Opportunity
Currently in use or present.	Used widely for mitigation.	Opportunity to expand and integrate.
(Sort of) Seldomly used or limited presence.	Limited use in mitigation planning.	Limited opportunity to expand and integrate.
(No) Not present or available.	Not used in mitigation planning.	No opportunity to expand or integrate.

Resource	HMP Integration			Notes / Additional Detail
	Status	Current Mitigation Use	Future Opportunity	
Education / Outreach Capabilities				
Education/Outreach Resources				
Website Dedicated to Hazard Topics				"Disaster Resources" webpage
Dedicated Social Media				Yes, City and Police FB, Instagram, Twitter
Hazard Info. Avail. at Library/ Planning Desk				
Annual Public Safety Events				not currently during COVID-19 pandemic
Ability to Field Public Tech. Assistance Requests				
Public Safety Newsletters or Printed Outreach				
Fire Safe Councils	N/A	N/A	N/A	
Resource Conservation Districts				Solano Resource Conservation District
Other				

2.5.1.5 Capability and Adaptive Capacity Opportunities

The City of Dixon identified many opportunities for strengthening community capabilities and adaptive capacity. The City considered this assessment in developing its Mitigation Strategy in Section 2.5.2. Volume 1, Section 5.3.5 includes an extensive list of federal and state funding opportunities to leverage to improve community capabilities. The City's General Plan is almost twenty years old and currently being updated. Like many small cities, Dixon could increase staffing capacity, especially with emergency response and grant writing assistance, and could look to increase fiscal capabilities to improve. This City could also review its inspection programs for stormwater and earthquake safety. The City also has good capacity under its current codes and current education and outreach capacity.



2.5.2 Mitigation Actions

Mitigation actions were developed based upon the jurisdiction’s priorities, risk assessment results, and mitigation alternatives. The mitigation action prioritization method used by all participating jurisdictions is described in Section 5.5.1 of Volume 1. Table 2-14 lists each priority mitigation action, responsible party, time frame, potential funding source, implementation steps, and resources need to implement based upon the Planning Committee consensus.

Each participating jurisdiction, including the City of Dixon, considered ongoing relevancy of mitigation actions from the existing MJHMP and retained or removed such actions while adding new relevant actions as well. Mitigation actions were examined for relevancy and the potential for future implementation and then evaluated for potential follow-up. Some mitigation actions developed during the previous HMP effort were not included because they were an inherent part of the HMP update process or were not detailed enough for implementation at a local Jurisdiction level. the City of Dixon has made significant changes to other mitigation actions because of the updated risk assessment and implementation strategy, to include more detail, or to update based on current mitigation practices. Volume 1, Section 5.5.2 provides a record of County wide mitigation actions, the status, and additional notes for each action.

Table 2-14 lists each mitigation action for the City of Dixon. Each participating jurisdiction developed unique mitigation actions, targeted at their own unique priorities and vulnerabilities. Each mitigation action identifies the responsible party, time frame, potential funding source, implementation steps and resources needed to implement these priority mitigation actions. As a living document, hazard problem statements and mitigation activities will be updated through MAST. The detail in Table 2-14 meets the regulatory requirements of FEMA and DMA 2000.

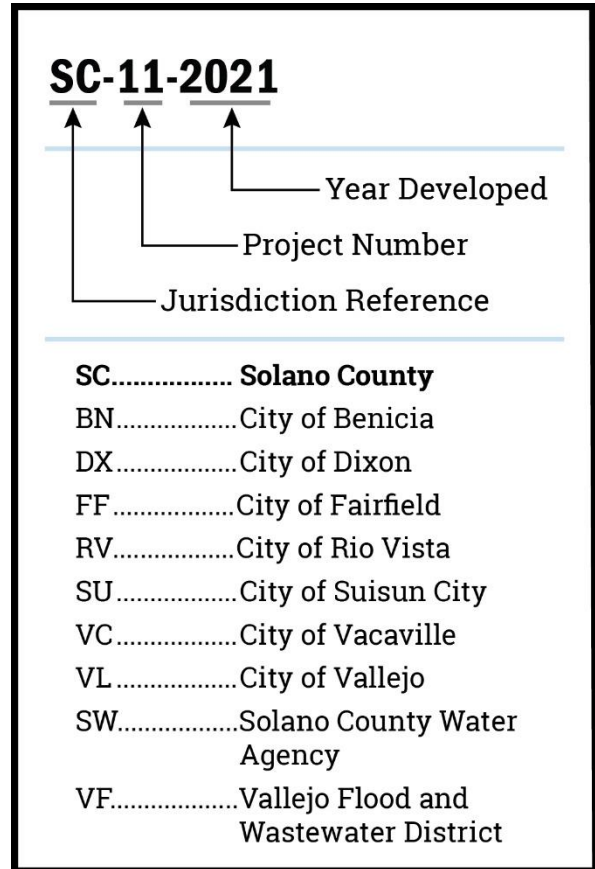


Figure 2-14: Mitigation Action Key



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Table 2-14: City of Dixon Mitigation Actions

Mitigation No.	Hazard Type	Mitigation Type	Status	Year	Primary Agency	Title/Description	Responsible Party	Estimated Cost	Estimated Benefit	Time Frame	HMA Activity Type	Potential Grant Source	Priority	Goal	Related Problem Statements
ma-AH-DX-116	All Hazard	ES - Emergency Services	Pending	2021	City of Dixon	Develop an assessment plan to determine railway points of vulnerability to more accurately predict areas of which would be impacted most during railway damage events. The plan can include preparedness plans to quickly initiate detours to maintain a secondary access point to the interstate and operations to activate.	City Public Works in coordination with the railroad entity.	Medium - The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.	Medium - Project will have a long-term impact on the reduction of risk exposure for life and property, or project will not provide an immediate reduction in the risk exposure for property.	3-5 Years	N/A	EMPG , Internal Funding	High	Goal 2: Infrastructure	ps-AH-DX-149
ma-AH-DX-117	All Hazard	ES - Emergency Services	Pending	2021	City of Dixon	Assess alert systems in Dixon. Include in the plan researched funding opportunities to procure the alert system and continued coordination with County.	Fire Department	Medium - The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.	Medium - Project will have a long-term impact on the reduction of risk exposure for life and property, or project will not provide an immediate reduction in the risk exposure for property.	1-3 Years	N/A	EMPG , Internal Funding	High	Goal 1: People , Goal 4: Resilience	ps-AH-DX-150
ma-CC-DX-215	Climate Change	PE&A - Public Education & Awareness	Ongoing	2021	City of Dixon	Participate in regional climate change vulnerability and adaptation efforts	Planning, all staff	Low - The project could be funded under the existing budget. The project is part of or can be part of an ongoing existing program.	High - Project will provide an immediate reduction of risk exposure for life and property.	Ongoing	Planning	HMGP / BRIC , Internal Funding	Medium	Goal 3: Environment , Goal 4: Resilience	ps-CC-DX-180
ma-DR-DX-118	Drought	PE&A - Public Education & Awareness	Pending	2021	City of Dixon	Develop a public education campaign to encourage water conservation during drought. The intent is to avoid issuance of water restriction emergency declarations.	City Public Works; California Water Service	Low - The project could be funded under the existing budget. The project is part of or can be part of an ongoing existing program.	Medium - Project will have a long-term impact on the reduction of risk exposure for life and property, or project will not provide an immediate reduction in the risk exposure for property.	1-3 Years	5%	HMGP / BRIC , Internal Funding	Medium	Goal 4: Resilience	ps-DR-DX-157
ma-EQ-DX-119	Earthquake	PRV - Prevention	Pending	2021	City of Dixon	Conduct public education campaign(s) on earthquake preparedness and liquefaction.	City of Dixon	Low - The project could be funded under the existing budget. The project is part of or can be part of an ongoing existing program.	Medium - Project will have a long-term impact on the reduction of risk exposure for life and property, or project will not provide an immediate reduction in the risk exposure for property.	1-3 Years	5%	EMPG , Internal Funding	High	Goal 1: People , Goal 4: Resilience	ps-EQ-DX-151
ma-EQ-DX-120	Earthquake	SP - Structural Projects	Pending	2021	City of Dixon	Retrofit City-owned critical facilities and buildings.	City Public Works & Engineering	High - Existing funding will not cover the cost of the project; implementation would require new revenue through an alternative source (for example, bonds, grants, and fee increases).	High - Project will provide an immediate reduction of risk exposure for life and property.	3-5 Years	Project	HMGP / BRIC	High	Goal 2: Infrastructure	ps-EQ-DX-152

Mitigation No.	Hazard Type	Mitigation Type	Status	Year	Primary Agency	Title/Description	Responsible Party	Estimated Cost	Estimated Benefit	Time Frame	HMA Activity Type	Potential Grant Source	Priority	Goal	Related Problem Statements
ma-EQ-DX-121	Earthquake	SP - Structural Projects	Pending	2021	City of Dixon	Reinforce the city's well systems including the well pumps to enhance the survivability of the systems during earthquake events, decreasing the chances of experiencing water supply issues or water loss.	City Public Works & Engineering	Medium - The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.	High - Project will provide an immediate reduction of risk exposure for life and property.	3-5 Years	Project	HMGP / BRIC , Internal Funding	High	Goal 2: Infrastructure , Goal 4: Resilience	ps-EQ-DX-153
ma-EQ-DX-122	Earthquake	ES - Emergency Services	Pending	2021	City of Dixon	Conduct public outreach to enhance awareness of PGE lines throughout the city and the associated hazards with gas leaks and/or line ruptures.	Fire Department	Low - The project could be funded under the existing budget. The project is part of or can be part of an ongoing existing program.	Medium - Project will have a long-term impact on the reduction of risk exposure for life and property, or project will not provide an immediate reduction in the risk exposure for property.	1-3 Years	5%	EMPG , Internal Funding	High	Goal 1: People , Goal 4: Resilience	ps-EQ-DX-154
ma-EQ-DX-123	Earthquake	SP - Structural Projects	Pending	2021	City of Dixon	Seismic Retrofit of vitrified clay pipes for sewer lines throughout the municipality, to enhance the sewer line's ability to withstand seismic shaking. Enhancements may include complete replacement dependent upon the clay pipe condition.	City Public Works & Engineering	High - Existing funding will not cover the cost of the project; implementation would require new revenue through an alternative source (for example, bonds, grants, and fee increases).	High - Project will provide an immediate reduction of risk exposure for life and property.	3-5 Years	Project	HMGP / BRIC , Internal Funding	High	Goal 2: Infrastructure	ps-EQ-DX-155
ma-EW-DX-124	Extreme Weather	PRV - Prevention	Pending	2021	City of Dixon	Clear right-of-way for utilities that provide power and communication to critical facilities and are at-risk to fire susceptibility.	Fire Department	Medium - The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.	High - Project will provide an immediate reduction of risk exposure for life and property.	1-3 Years	N/A	FP&S , Internal Funding	High	Goal 2: Infrastructure	ps-EW-DX-158
ma-EW-DX-125	Extreme Weather	ES - Emergency Services	Pending	2021	City of Dixon	Install backup power generators to support operation of critical facilities during loss of power, such as from heavy rain and high wind events, including water and wastewater systems, emergency services, and cooling and heating centers	Fire Department	Medium - The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.	Medium - Project will have a long-term impact on the reduction of risk exposure for life and property, or project will not provide an immediate reduction in the risk exposure for property.	1-3 Years	Project	HMGP / BRIC , EMPG , Internal Funding	High	Goal 1: People , Goal 4: Resilience	ps-EW-DX-160
ma-EW-DX-179	Extreme Weather	PRV - Prevention	Pending	2021	City of Dixon	Develop an annual drainage maintenance plan including assessing high water marks to assess water depth and settling locations. Including in the plan the clearing of inlets annually (or more often as necessary) prior to the monsoon season.	City Public Works & Engineering	Medium - The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.	Medium - Project will have a long-term impact on the reduction of risk exposure for life and property, or project will not provide an immediate reduction in the risk exposure for property.	1-3 Years	N/A	Internal Funding	High	Goal 2: Infrastructure , Goal 4: Resilience	ps-EW-DX-159

Mitigation No.	Hazard Type	Mitigation Type	Status	Year	Primary Agency	Title/Description	Responsible Party	Estimated Cost	Estimated Benefit	Time Frame	HMA Activity Type	Potential Grant Source	Priority	Goal	Related Problem Statements
ma-FL-DX-126	Flood	PE&A - Public Education & Awareness	Pending	2021	City of Dixon	Develop a public outreach program that informs property owners located in areas of concern for flood about voluntary flood insurance and preparation tools to help with mitigation of flood events.	Fire Department	Low - The project could be funded under the existing budget. The project is part of or can be part of an ongoing existing program.	Medium - Project will have a long-term impact on the reduction of risk exposure for life and property, or project will not provide an immediate reduction in the risk exposure for property.	1-3 Years	5%	EMPG , Internal Funding	Medium	Goal 4: Resilience	ps-FL-DX-156, ps-CC-DX-180
ma-FL-DX-186	Flood	PRV - Prevention , PPRO - Property Protection	Pending	2021	City of Dixon	Assess areas subject to repeated flooding and increased flooding due to climate change; implement elevations and retrofits for bridges and culverts to allow proper storm water / 100-YR flows.	City Public Works & Engineering	High - Existing funding will not cover the cost of the project; implementation would require new revenue through an alternative source (for example, bonds, grants, and fee increases).	High - Project will provide an immediate reduction of risk exposure for life and property.	3-5 Years	Planning	HMGP / BRIC , FMA	High	Goal 2: Infrastructure , Goal 4: Resilience	ps-FL-DX-156, ps-CC-DX-180



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SECTION 3

JURISDICTIONAL ANNEX:

City of Fairfield



SOLANO COUNTY

MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

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FINAL for adoption



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Solano County

Multi-Jurisdiction Hazard Mitigation Plan

CITY OF FAIRFIELD (FF.)

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Adoption Resolution

To comply with DMA 2000, the City of Fairfield has officially adopted this Solano County Multi-Jurisdictional Hazard Mitigation Plan (MJHMP), Volume 1, and its jurisdictional annex. The adoption of the MJHMP recognizes the City’s commitment to reducing the impacts of natural hazards. See included adoption resolution.

CITY OF FAIRFIELD

RESOLUTION NO. 2022-34

**RESOLUTION OF THE CITY COUNCIL OF THE CITY OF FAIRFIELD TO ADOPT THE UPDATED
SOLANO MULTI-JURISDICTION HAZARD MITIGATION PLAN**

WHEREAS, the City of Fairfield, a political subdivision of the State of California, is an official participating jurisdiction in the updated Solano Multi-Jurisdiction Hazard Mitigation Plan (MJHMP); and

WHEREAS, the City of Fairfield recognizes the updated MJHMP as the official hazard mitigation plan for participating jurisdictions; and

WHEREAS, the City of Fairfield has gathered information and prepared the updated MJHMP in accordance with Federal Emergency Management Agency (FEMA) requirements at 44 CFR § 201.6; and

WHEREAS, Volume 1 of the updated MJHMP recognizes the threat that natural hazards pose to people and property Solano County-wide; and

WHEREAS, the City of Fairfield's Annex to Volume 1 of the updated MJHMP provides additional information specific to the City of Fairfield with a focus on providing additional details on the planning process, risk assessment, and mitigation strategy for this community; and

WHEREAS, the City of Fairfield has reviewed Volume 1 of the updated MJHMP and its Annex and affirms that the plan actions in Volume 1 and its Annex should reduce the potential for harm to people and property from future hazard occurrences within the community; and

WHEREAS, the U. S. Congress passed the Disaster Mitigation Act of 2000 (Disaster Mitigation Act) emphasizing the need for pre-disaster mitigation of potential hazards; and

WHEREAS, the Disaster Mitigation Act made available mitigation grants to state and local governments; and

WHEREAS, an adopted hazard mitigation plan is required as a condition of future funding for mitigation projects under multiple FEMA pre-and post-disaster mitigation grant programs; and

WHEREAS, the City of Fairfield fully participated in the FEMA-prescribed mitigation planning process to prepare this updated MJHMP; and

WHEREAS, the residents were afforded opportunities to comment and provide input in the updated MJHMP and the mitigation actions in the Plan; and

WHEREAS, the City of Fairfield, as a fully participating jurisdiction of the updated MJHMP, is an eligible sub-applicant to the State of California under FEMA's hazard mitigation grant program guidance; and

WHEREAS, the California Office of Emergency Services (Cal OES) and the FEMA Region IX officials have reviewed the updated MJHMP and approved it contingent upon this official adoption by the participating governing body; and

WHEREAS, the City of Fairfield desires to comply with the requirements of the Disaster Mitigation Act and to augment its emergency planning efforts by formally adopting the updated MJHMP; and

WHEREAS, adoption by the governing body for the City of Fairfield demonstrates the jurisdiction's commitment to fulfilling the mitigation goals and objectives outlined in this updated MJHMP; and

WHEREAS, the adoption of this plan helps to coordinate the responsible agencies to carry out their responsibilities under the updated MJHMP.

NOW, THEREFORE, THE COUNCIL OF THE CITY OF FAIRFIELD HEREBY RESOLVES:

Section 1. The City of Fairfield City Council finds the facts mentioned above to be true and further finds that the City Council has jurisdiction to consider, approve, and adopt the subject of this Resolution.

Section 2. The City of Fairfield City Council does hereby adopt the updated Solano County Multi-Jurisdiction Hazard Mitigation Plan Volume 1 and its Annex, as approved by FEMA and Cal OES, as the official mitigation plan for the City of Fairfield.

Section 3. The City of Fairfield City Council authorizes the Solano County Emergency Services Manager to submit an approved and signed copy of this adoption resolution to the California Office of Emergency Services and FEMA Region IX officials to enable the plan's final approval in accordance with the requirements of the Disaster Mitigation Act of 2000.

PASSED AND ADOPTED this 1st day of March, 2022, by the following vote:

AYES: COUNCILMEMBERS: PRICE / BERTANI / MOY / PANDURO / TIMM / TONNESEN / VACCARO

NOES: COUNCILMEMBERS: None

ABSENT: COUNCILMEMBERS: None

ABSTAIN: COUNCILMEMBERS: None

Alan J. Timm
MAYOR

ATTEST:
Karen L. Rees
CITY CLERK



Section 3. City of Fairfield

3.1 Purpose

This Annex details the hazard mitigation planning elements specific to the City of Fairfield. This Annex is not intended to be a standalone document but appends to and supplements the information contained in the umbrella plan document. As such, all sections of the umbrella plan, including the planning process and other procedural requirements apply to and were met by the City of Fairfield. This Annex provides additional information specific to the City of Fairfield, with a focus on providing additional details on the planning process, risk assessment, and mitigation strategy for this community.

Hazard Mitigation Plan Points of Contact

Primary Point of Contact

John Sturdee, Deputy Chief
City of Fairfield
1200 Kentucky Street
Fairfield, CA 94533
Telephone: (707) 436-7228
e-mail: jsturdee@fairfield.ca.gov

Alternate Point of Contact

Steven Conti, Fire Marshal
City of Fairfield
1200 Kentucky Street
Fairfield, CA 94533
Telephone: (707) 428-7550
e-mail: sconti@fairfield.ca.gov

3.2 Planning Methodology

The City of Fairfield followed the planning process detailed in Volume 1, Section 3, including participating in the County Hazard Mitigation Planning Committee (HMPC) and Steering Committee and formulating their own internal planning team to support the broader planning process. Internal planning participants, their positions, and how they participated in the planning process are shown in Table 3-1.

Table 3-1: Planning Committee Members

Planning Committee Members	Department
John Sturdee	Battalion Fire Chief
Steven Conti	Fire Marshal
Amy Kreimeier	Senior Planner
Bill Way	Communications Manager
Brian Coy	Building Inspector
David Gassaway	Ast. City Manager & Community Development
Deanna Cantrell	Chief of Police
Brad Collins	Operations Captain
Jorge Barrera	Sr. Economic Development Project Manager
Stefan Chatwin	City Manager
Mike Gray	Public Works Operations Superintendent
Ryan Panganiban	Ast. Public Works Director
George Shimboff	Water Distribution Manager

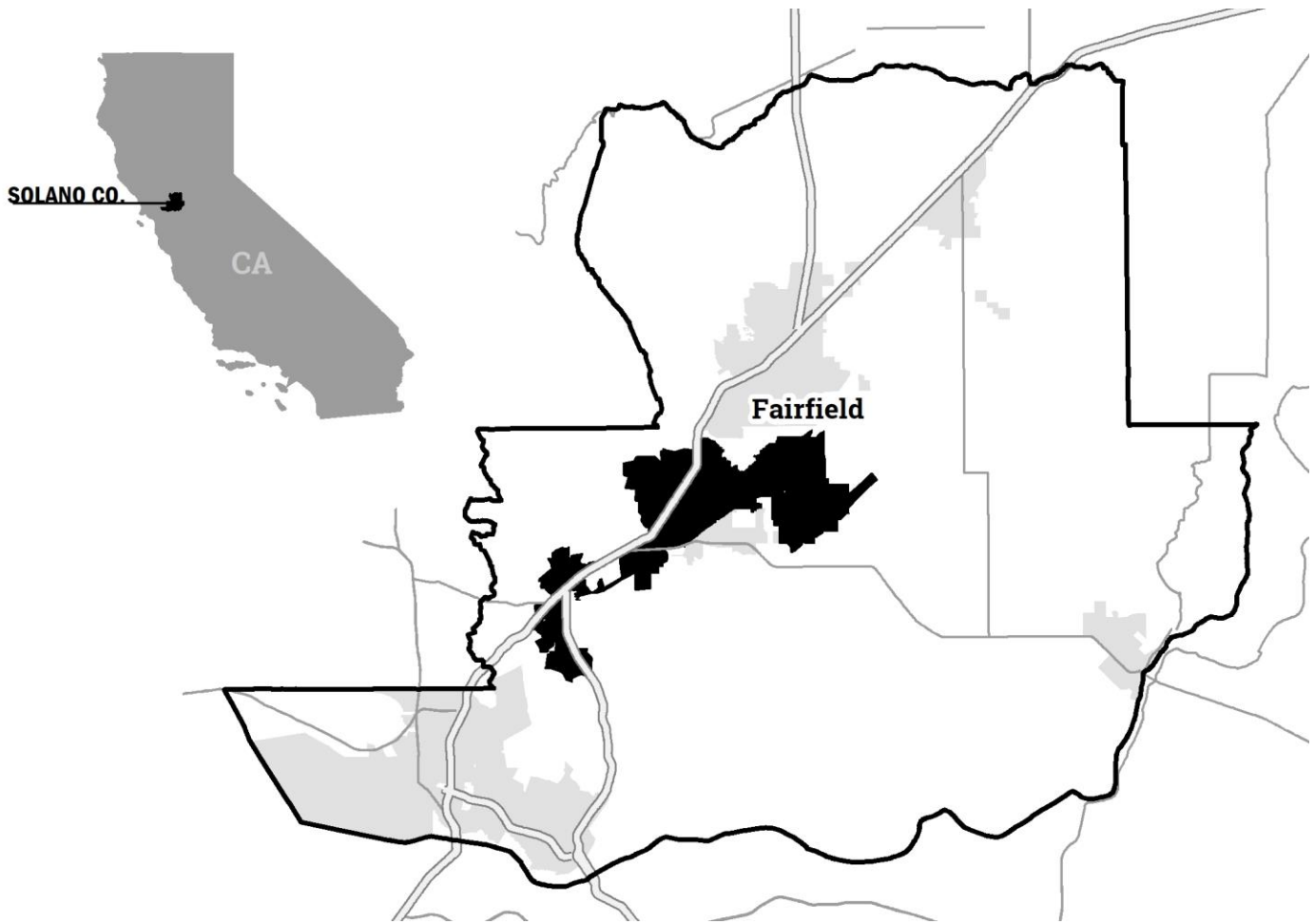


Figure 3-1: Fairfield

3.3 What's New

The City of Fairfield has been making improvements toward reducing natural hazard risks to life and property since the existing MJHMP was adopted.

The City reevaluated previous mitigation actions, including considerations of progress made on mitigation efforts, and retained them as pending or ongoing; no tables for completed or cancelled mitigation actions are included. Ongoing and pending mitigation actions are described in Table 3-14.



Success Story: New Geologic Hazard Abatement District (GHAD). The City created a Geologic Hazard Abatement District (GHAD) for paradise valley referred to as the Paradise Valley Maintenance and Monitoring District (PVMMMD). The district was established by the City of Fairfield City Council in 2010. The District was created to monitor, prevent, and mitigate geologic hazards (a.k.a. slope failure) in the Paradise Valley.

Success Story: EOC Relocation. The City relocated their Emergency Operations Center (EOC) to the Fire Administration Building, enhancing the ability for the center to withstand earthquakes.

3.4 Risk Assessment

The intent of this section is to profile the City of Fairfield's hazards and assess the City's vulnerabilities, distinct from that of the County wide planning area. The hazard profiles in Volume 1 discuss overall impacts to the planning area and describes the hazard problem description, hazard extent, magnitude/severity, previous occurrences of hazard events and the likelihood of future occurrences. For more information on Risk Assessment Methodologies, see Vol. 1 and Appendix A.

3.4.1 Hazard Screening Criteria

Planning Team members from each participating jurisdiction collectively discussed which hazards should be profiled in the Plan and which should not. The results of that discussion can be found in Table 3-2. Detailed hazard profiles of the most significant County wide hazards are described in Section 4 of Volume 1. The Planning Team reviewed previously prepared hazard mitigation plans and other relevant documents to determine the realm of natural hazards that have the potential to affect the City of Fairfield. Table 3-3 provides a crosswalk of hazards identified in Vol. 1 of this plan, the City of Fairfield General Plan, and 2018 California State Hazard Mitigation Plan. The crosswalk was used to develop a preliminary hazards list, providing a framework for the Planning Team members to evaluate which hazards were truly relevant to the City of Fairfield and which ones were not. Section 3.4.2 below describes the hazard risk ranking process that was performed by the planning team which prioritized hazards that are specifically relevant to the City of Fairfield.



Table 3-2: County-Wide Hazard Prioritization

Hazard Type	Explanation
Climate Change	High priority county-wide, profiled hazard.
Dam/ Levee failure	Dam failure is possible in Solano County but is best addressed in other plans, specifically Emergency Action Plans for high hazard dams affecting Solano County.
Drought	High priority county-wide, profiled hazard.
Earthquake/ Geologic Hazards	High priority county-wide, profiled hazard.
Flood	High priority county-wide, profiled hazard.
Hazardous Material	While hazardous materials can release and impact the County, there are better avenues to address this hazard outside this plan.
High Winds/ Straight Line Winds	High priority county-wide, profiled as part of Extreme Weather.
Insect Hazards	While hazardous insects exist in Solano County, this was not considered a priority and is not profiled in this plan.
Pandemic Disease	While pandemic disease can impact the County, there are better avenues to address this hazard outside this plan.
Extreme Weather, including:	High priority county-wide for high wind, heavy rain, and high heat.
Extreme Heat	Profiled as part of Extreme Weather.
Hail	Hail events are rare and not considered a priority.
High Wind	Profiled as part of Extreme Weather.
Heavy Rain	Profiled as part of Extreme Weather.
Fog	Fog events are rare and are not considered a priority.
Lightning	Not a priority as an extreme weather event; discussed as source of wildfire.
Severe Thunderstorm	Severe thunderstorms were not identified as a priority in this plan.
Winter Storm / Extreme Cold/ Freeze Events	Winter storms are rare in Solano County and not identified as a priority for this plan.
Slope Failure	High priority county-wide, profiled hazard.
Soil Hazards	While limited soil hazards exist in Solano County (erosion and shifting soils), these are not prioritized in this plan. Erosion discussed under flood hazard.
Terrorism/Human Caused Threats	While terrorism is certainly a threat to the County and participating jurisdictions, it is best addressed in other plans as this HMP does not address human-caused threats.
Tornado	Impacts to the County from tornados are extremely unlikely, if any.
Volcanic Activity	Due to distance from volcanoes and the limited chance of an eruption, this hazard was not identified as a priority.
Wildfire	High priority county-wide, profiled hazard.



Table 3-3: City Document Review Crosswalk

Hazards	2002 Fairfield General Plan	2011 Fairfield HMP	2014 Solano County HMP	2018 California State HMP
Agricultural Pests				■
Climate Change			■	■
Dam Failure		■	■	■
Drought		■	■	■
Earthquake	■	■	■	■
Flood	■	■	■	■
Landslide		■	■	■
Levee Failure				■
Manmade Hazards	■			■
Pandemic Disease				■
Sea Level Rise			■	■
Severe Weather		■	■	■
Soil Hazards		■		■
Terrorism & Tech Hazards	■			■
Tsunami		■		■
Volcano				■
Wildfire	■	■	■	■

3.4.2 Hazard Risk Ranking

The City of Fairfield’s Planning Team used the same hazard prioritization process as the Solano County Hazard Mitigation Planning Committee. This process is described in detail in Section 4.3.1 of Vol. 1. Figure 3-2 displays the results of the hazard risk ranking exercise that was performed by the Planning Team. The Planning Team chose to assess the City of Fairfield’s vulnerability to the following hazards:

- Wildfire
- Extreme Weather (high wind, heavy rain, and high heat)
- Flood
- Climate Change
- Earthquake

All these hazards have been profiled in Vol. 1 of this document. The purpose of this annex to specifically address the City of Fairfield’s vulnerability to these specifically-identified hazards.

3.4.3 Vulnerability Assessment

Assessing vulnerabilities exposes the unique characteristics of individual hazards and begins the process of narrowing down which areas within the City of Fairfield are vulnerable to specific hazard events. The vulnerability assessment considered unique local knowledge of hazards and impacts and a GIS overlaying method for examining such vulnerabilities more in depth. Using these methods, participating jurisdictions estimated vulnerable populations, infrastructure, and potential losses from hazards.



3.4.3.1 Risk Assessment

Each participating jurisdiction developed a risk matrix that assessed the probability and impact of various hazards within the jurisdiction. Figure 3-2 is the jurisdiction's risk assessment, which was completed in part using the web based and interactive Risk Assessment Mapping Platform (RAMP), accessed via the project website at www.mitigatehazards.com. RAMP allows interactive discovery of robust risk, vulnerability, and exposure data developed especially for Solano County. RAMP is a mapping platform built specifically for mitigation planning. It displays County/jurisdiction facilities and buildings overlaid with natural hazards layers to bring interactivity and individual discovery to the GIS analysis performed for the MJHMP. See Vol. 1 for a detailed description of RAMP. The Planning Team used RAMP in meetings and as needed to understand vulnerabilities to the City of Fairfield. Users interactively filter facilities and buildings by natural hazard zones and/or construction characteristics. The City of Fairfield also conducted a more detailed climate vulnerability assessment, included as Appendix A to this annex. The climate vulnerability assessment analyzed climate-related vulnerabilities by considering the impact from the climate vulnerability and the community's adaptive capacity to respond to the particular vulnerability.

3.4.3.2 Exposure Maps and Damage Estimation Tables

The included snapshot maps and damage estimation tables illustrate the City of Fairfield's vulnerability to specific hazards. Based on the risk assessment, the snapshot maps focus on those hazards prioritized by the jurisdiction. These maps helped the Planning Team understand the exposure of population, parcels, and critical infrastructure to specific hazards. Each map contains an exposure summary that displays the percent of the population, the improvement and content value of parcels, and the amount of critical infrastructure that is exposed to each respective hazard. For flood and earthquake, detailed damage estimations were conducted through FEMA's Hazus software and are shown in tabular form. Additional mapping is also included. Figures and tables include:

- Figure 3-3: Fairfield - Wildfire Risk Exposure
- Figure 3-4: Fairfield- Mean Fire Return Interval
- Figure 3-5: Fairfield - FEMA Flood Risk Exposure
- Table 3-4: Fairfield - Damage Estimate Summaries, 100YR Flood
- Table 3-5: Fairfield - Damage Estimate Summaries, 500 YR Flood
- Figure 3-6: Fairfield – DWR Best Available Mapping for Flooding
- Figure 3-7: Fairfield - Hayward Rodger's Creek EQ Scenario (M7.1)
- Table 3-6: Fairfield - Hayward Rogers Creek Damage Estimate Summaries
- Figure 3-8: Fairfield - Concord Green Valley EQ Scenario (M6.8)
- Table 3-7: Fairfield - Concord Green Valley Damage Estimate Summaries
- Figure 3-9: Fairfield - Liquefaction Potential
- Figure 3-10: Fairfield - July Max Temp
- Figure 3-11: Fairfield - Average Precipitation
- Figure 3-12: Fairfield - Wind Speed
- Figure 3-13: Fairfield - RCP Comparison
- Figure 3-14: Fairfield - Sea Level Rise Exposure



Risk Assessment Matrix Definitions

PROBABILITY RATING

The likelihood of a hazard event occurring within a time period?

PROBABILITY	Highly Likely	Highly likely - 100% annual probability. Or likely to occur every year in your lifetime.
	Likely	Likely - Between 10 and 100% annual probability. Or will occur several times in your lifetime.
	Possible	Possible - Between 1 and 10% annual probability. Or likely to occur some time in your lifetime.
	Unlikely	Unlikely - Less than 1% annual probability. Or unlikely but possible to occur in your lifetime.

IMPACT RATING

In terms of injuries, damage, or death, would you anticipate impacts to be minor, limited, critical, or catastrophic when a significant hazard event occurs? The impact could be in terms of one hazard event (flooding from a culvert failure) or a large-scale event (multiple rivers flooding) in the same jurisdictional boundary.

IMPACT			
Minor	Limited	Critical	Catastrophic

Minor - Very few injuries, if any. Only minor property damage and minimal disruption on quality of life. Temporary shutdown of critical facilities.

Limited - Minor injuries only. Approx. 10% or less of property in disaster footprint damaged or destroyed. Complete shutdown of critical facilities for more than one day.

Critical - Multiple deaths/injuries possible. Between 25% and 50% of property in disaster footprint is damaged or destroyed. Complete shutdown of critical facilities for more than one week.

Catastrophic - High number of deaths/injuries possible. More than 50% of property in affected area damaged or destroyed. Complete shutdown of critical facilities for 30 days or more.

To concentrate resources on highest priority hazards, the jurisdictional planning team will focus on "High" and "Extreme" risk hazards in this annex. These hazards have higher probability and greater impact as it relates to the jurisdiction's planning area.

Hazard definitions are included in Vol. 1 of this plan.

Hazard Information / Legend:



Climate Change is prioritized for all jurisdictions.



Sea-Level Rise is a subhazard of climate change for some jurisdictions (County, Vallejo, Benicia, Suisun City, Fairfield).

Extreme Weather in Solano County includes high heat, high wind, and heavy rain.



If a hazard symbol is grey, the planning team did not develop hazard vulnerability information due to lower perceived probability and impact.

City of Fairfield Risk Matrix

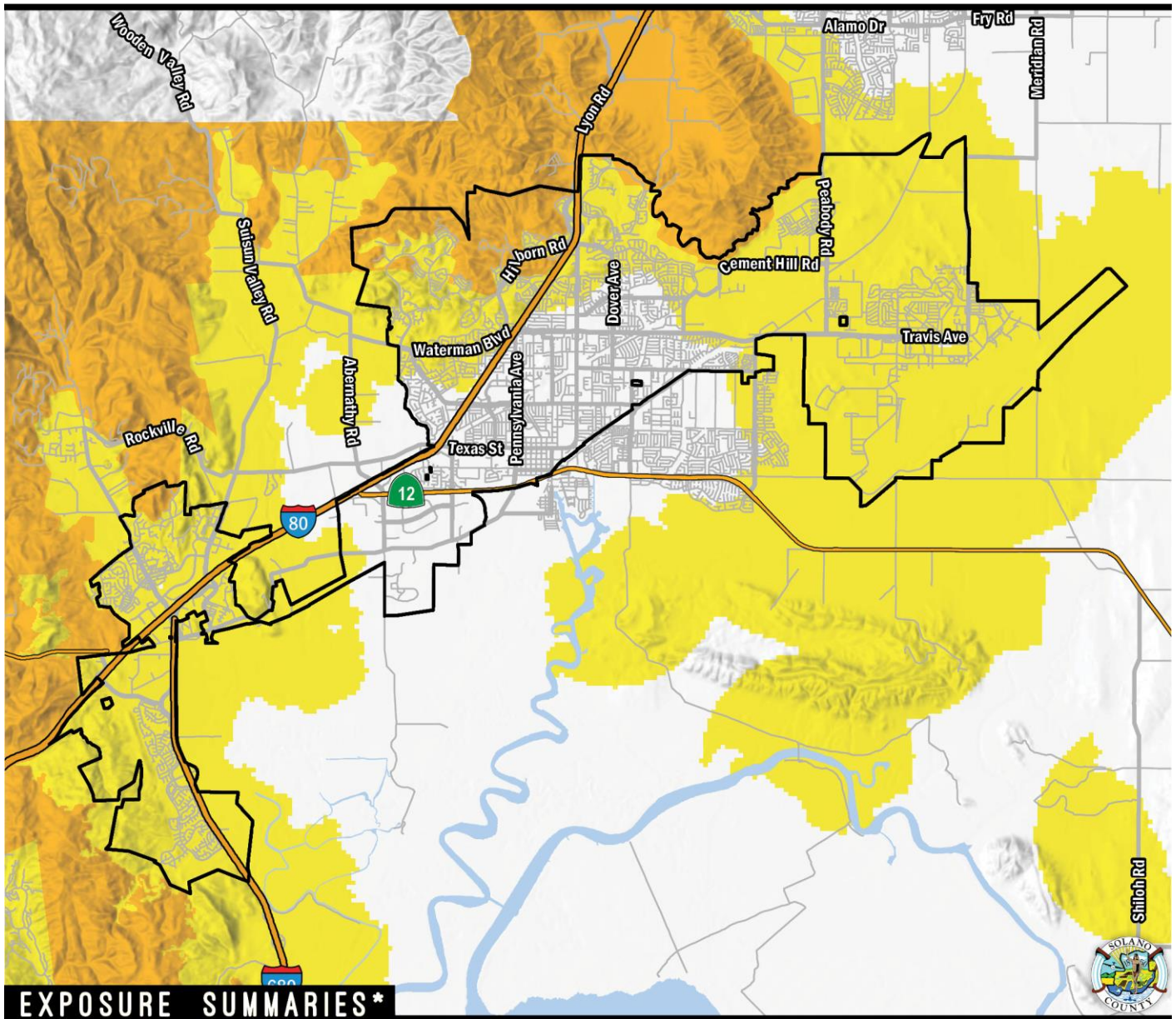
		IMPACT			
		Minor	Limited	Critical	Catastrophic
PROBABILITY	Highly Likely	Medium	High	Extreme	Extreme
	Likely	Medium			
	Possible			High	High
	Unlikely	Low	Low	Medium	Medium

Figure 3-2: City of Fairfield Risk Assessment



WILDFIRE RISK EXPOSURE

FAIRFIELD



EXPOSURE SUMMARIES*

POPULATION COUNT IN HAZARD AREA	
Count	Exp. Rate**
3,474	3%
Count Includes: ■ H ■ VH	

PARCEL COUNT IN HAZARD AREA	
Count	Exp. Rate**
919	3%
Count Includes: ■ H ■ VH	

PARCEL VALUE IN HAZARD AREA	
Sum of Improvement Value	Exp. Rate**
\$726,637,250	4%
Sum of Content Value	
\$363,318,625	3%
Count Includes: ■ H ■ VH	

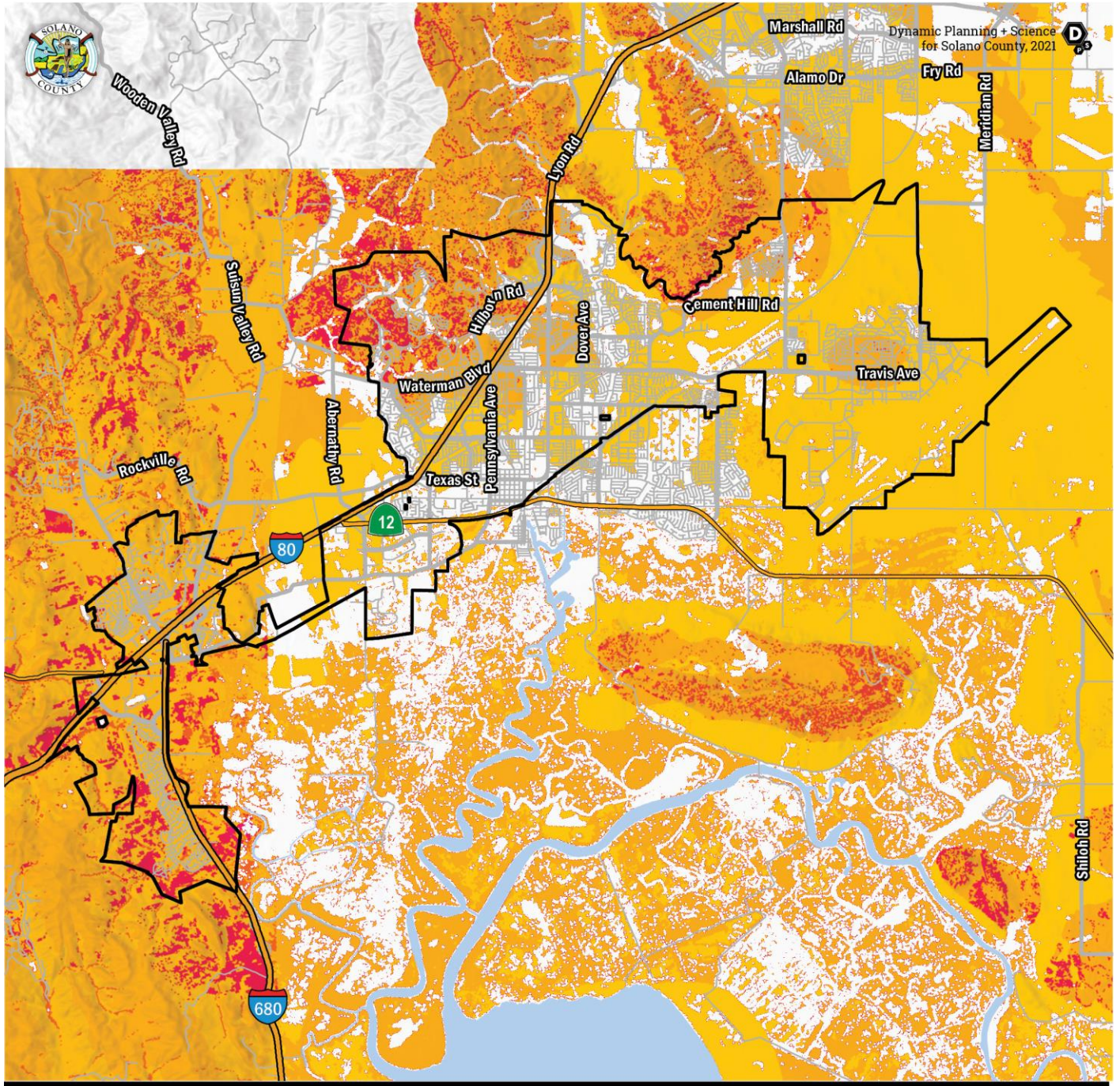
CRITICAL INFRASTRUCTURE COUNTS IN HAZARD AREA			
Infrastructure Category	Count	Exp. Rate**	Count/Sum Includes:
Essential Facilities	0	0%	■ H ■ VH
High Potential Loss	20	3%	Sum of Transportation & Lifeline Linear Mileage
Transportation & Lifeline	7	1%	

MAP LEGEND

MODERATE
HIGH (H)
VERY HIGH (VH)

*Exposure summaries include high and very high risk areas. Hazard data source: Cal Fire, CPUC.
 **Exposure Rate - Exposed summary or count as a percentage of total summary or count within jurisdiction.
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Figure 3-3: Fairfield - Wildfire Risk Exposure Snapshot



MEAN FIRE RETURN INTERVAL FAIRFIELD

*Data sources: USGS LANDFIRE.

AVERAGE PERIOD BETWEEN FIRES (YEARS)

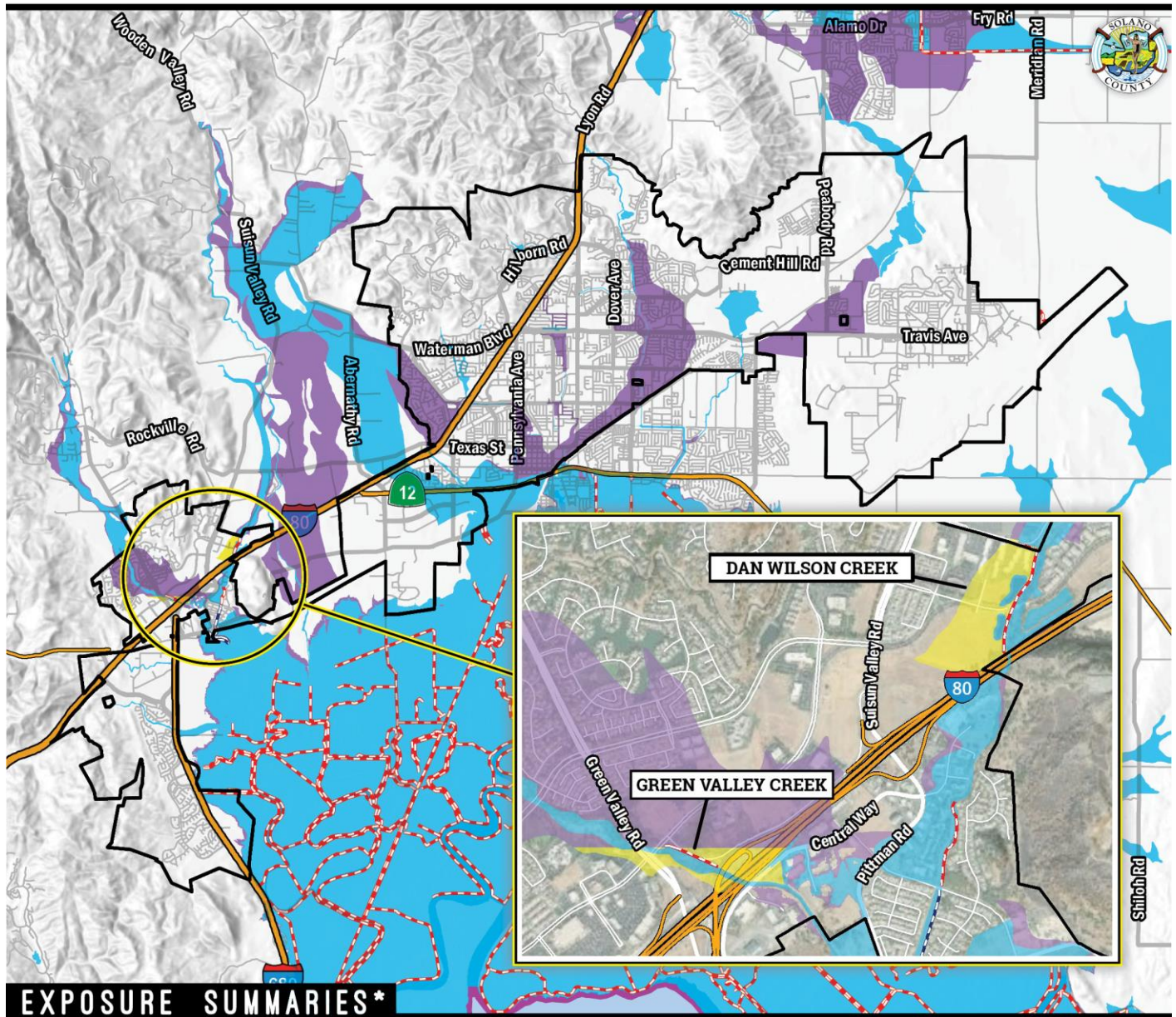
0-5	6-10	11-15	16-20	21-25	26-30	31-35	36-40	41-45	46-50	51-60	61-70	71-80	81-90	91-100	101-125	126-150	151-200	201-300	301-500	501-1000	>1000
-----	------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	-------	--------	---------	---------	---------	---------	---------	----------	-------

Figure 3-4: Fairfield- Mean Fire Return Interval



FEMA FLOOD RISK EXPOSURE

FAIRFIELD



EXPOSURE SUMMARIES*

POPULATION COUNT IN HAZARD AREA		PARCEL COUNT IN HAZARD AREA		PARCEL VALUE IN HAZARD AREA		CRITICAL INFRASTRUCTURE COUNTS IN HAZARD AREA			
Count	Exp. Rate**	Count	Exp. Rate**	Sum of Improvement Value	Exp. Rate**	Infrastructure Category	Count	Exp. Rate**	Count/Sum Includes:
28,187	25%	6,843	22%	\$4,084,514,140	20%	Essential Facilities	6	40%	100 + 500
Count Includes: 100 + 500		Count Includes: 100 + 500		\$2,768,758,748	20%	High Potential Loss	127	22%	Sum of Transportation & Lifeline Linear Mileage
				Count Includes: 100 + 500		Transportation & Lifeline	159	26%	149 18%

100-YR	COASTAL
AREA PROTECTED BY LEVEE	
500-YR	
PROJECT LEVEE	OTHER KNOWN LEVEES

*Exposure summaries include 100-year and 500-year flood zone areas, including coastal and leveed areas. Hazard data source: FEMA.
 **Exposure Rate - Exposed summary or count as a percentage of total summary or count within jurisdiction.

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Figure 3-5: Fairfield - FEMA Flood Risk Exposure Snapshot



Table 3-4: Fairfield - Damage Estimate Summaries, 100YR Flood

Building Type	Building Damage (\$)	Building Damage (% of total loss)	Content Damage (\$)	Content Damage (% of total loss)	Total Damage (\$)	Proportion of Loss (%)
Agriculture	\$0	0.0%	\$0	0.0%	\$0	0%
Commercial	\$611,896	0.7%	\$3,947,241	4.8%	\$4,559,137	6%
Education*	\$0	0.0%	\$0	0.0%	\$0	0%
Emergency	\$0	0.0%	\$0	0.0%	\$0	0%
Government	\$588	0.0%	\$90	0.0%	\$679	0%
Industrial	\$2,363,576	2.9%	\$64,348	0.1%	\$2,427,924	3%
Religion	\$39,743	0.0%	\$278,278	0.3%	\$318,021	0%
Residential	\$56,246,359	68.9%	\$18,073,864	22.1%	\$74,320,223	91%
Total	\$59,262,162	73%	\$22,363,822	27%	\$81,625,983	

*School district asset information not available during time of Hazus analysis.

Note: Total Inventory Values

1 - Building Replacement Costs = \$3,773,922,295

2 - Content Replacement Costs = \$2,667,166,517

3 - Total Value = \$6,441,088,812

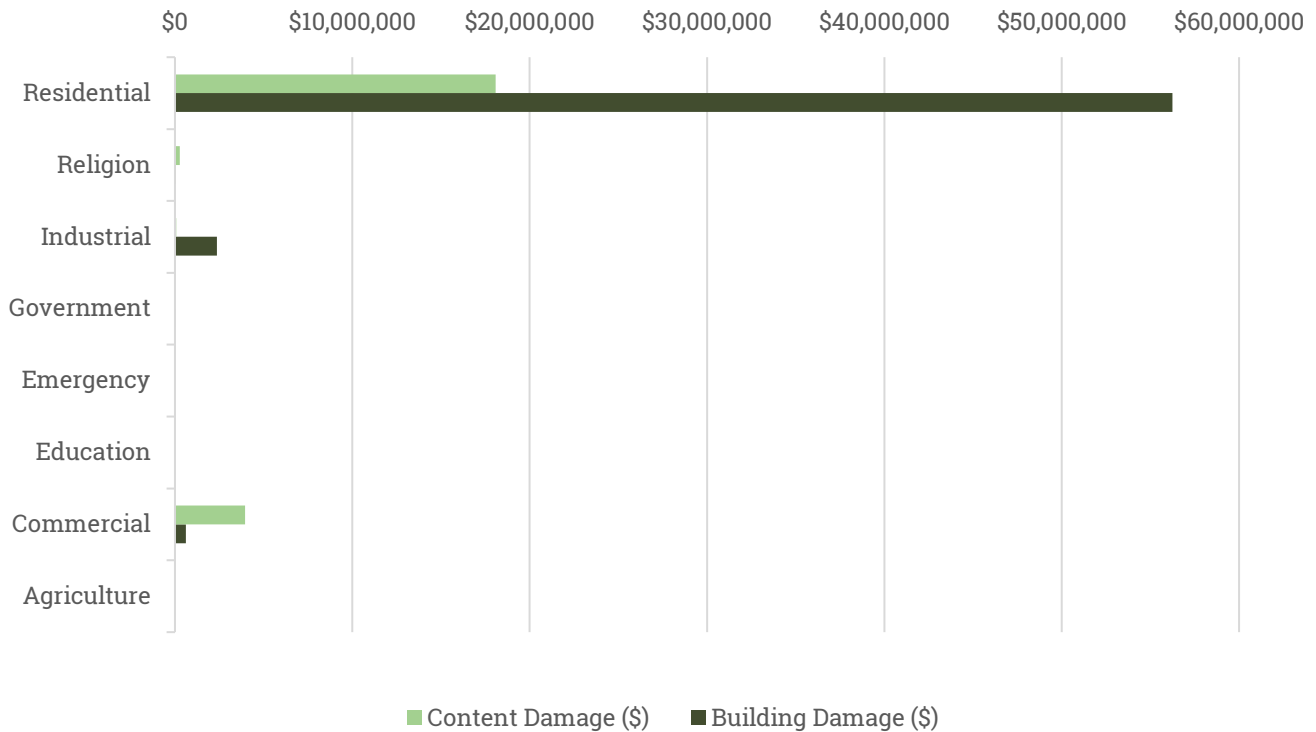




Table 3-5: Fairfield - Damage Estimate Summaries, 500 YR Flood

Building Type	Building Damage (\$)	Building Damage (% of total loss)	Content Damage (\$)	Content Damage (% of total loss)	Total Damage (\$)	Proportion of Loss (%)
Agriculture	\$0	0.0%	\$166	0.0%	\$166	0%
Commercial	\$1,366,801	0.8%	\$4,290,848	2.4%	\$5,657,650	3%
Education*	\$0	0.0%	\$0	0.0%	\$0	0%
Emergency	\$0	0.0%	\$0	0.0%	\$0	0%
Government	\$12,178	0.0%	\$15,134	0.0%	\$27,312	0%
Industrial	\$965,167	0.5%	\$1,239,414	0.7%	\$2,204,581	1%
Religion	\$23,861	0.0%	\$162,006	0.1%	\$185,867	0%
Residential	\$125,501,331	69.7%	\$46,518,495	25.8%	\$172,019,826	96%
Total	\$127,869,338	71%	\$52,226,065	29%	\$180,095,403	

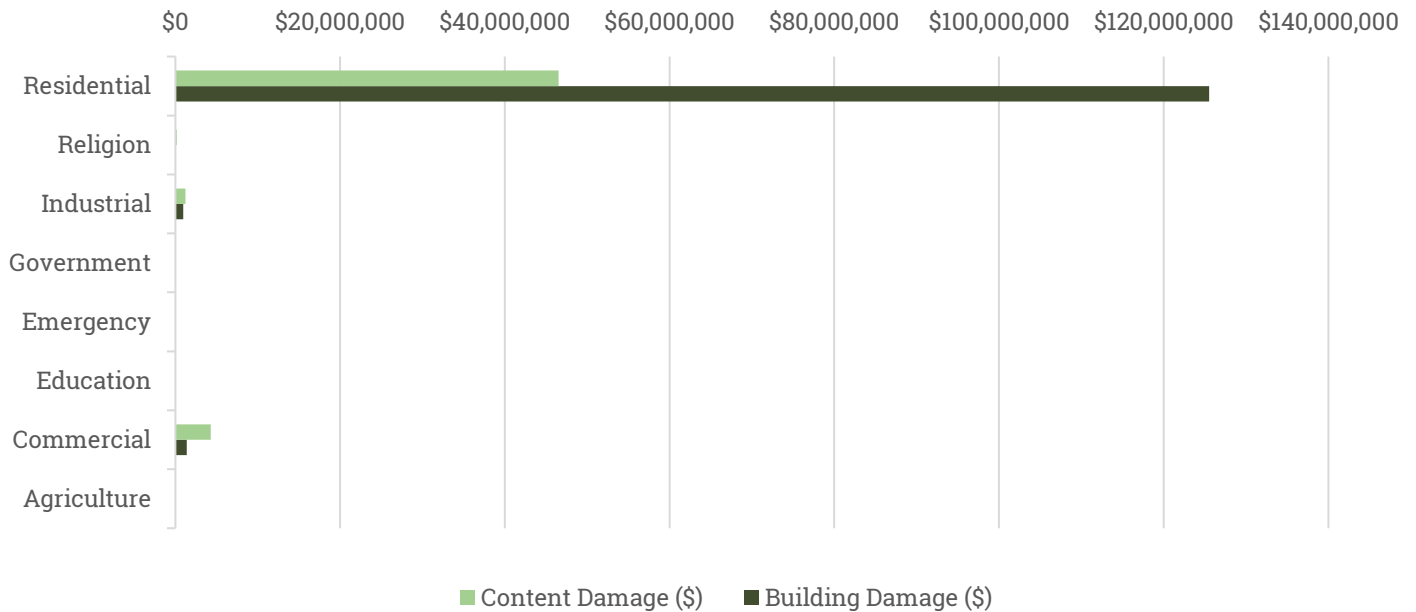
*School district asset information not available during time of Hazus analysis.

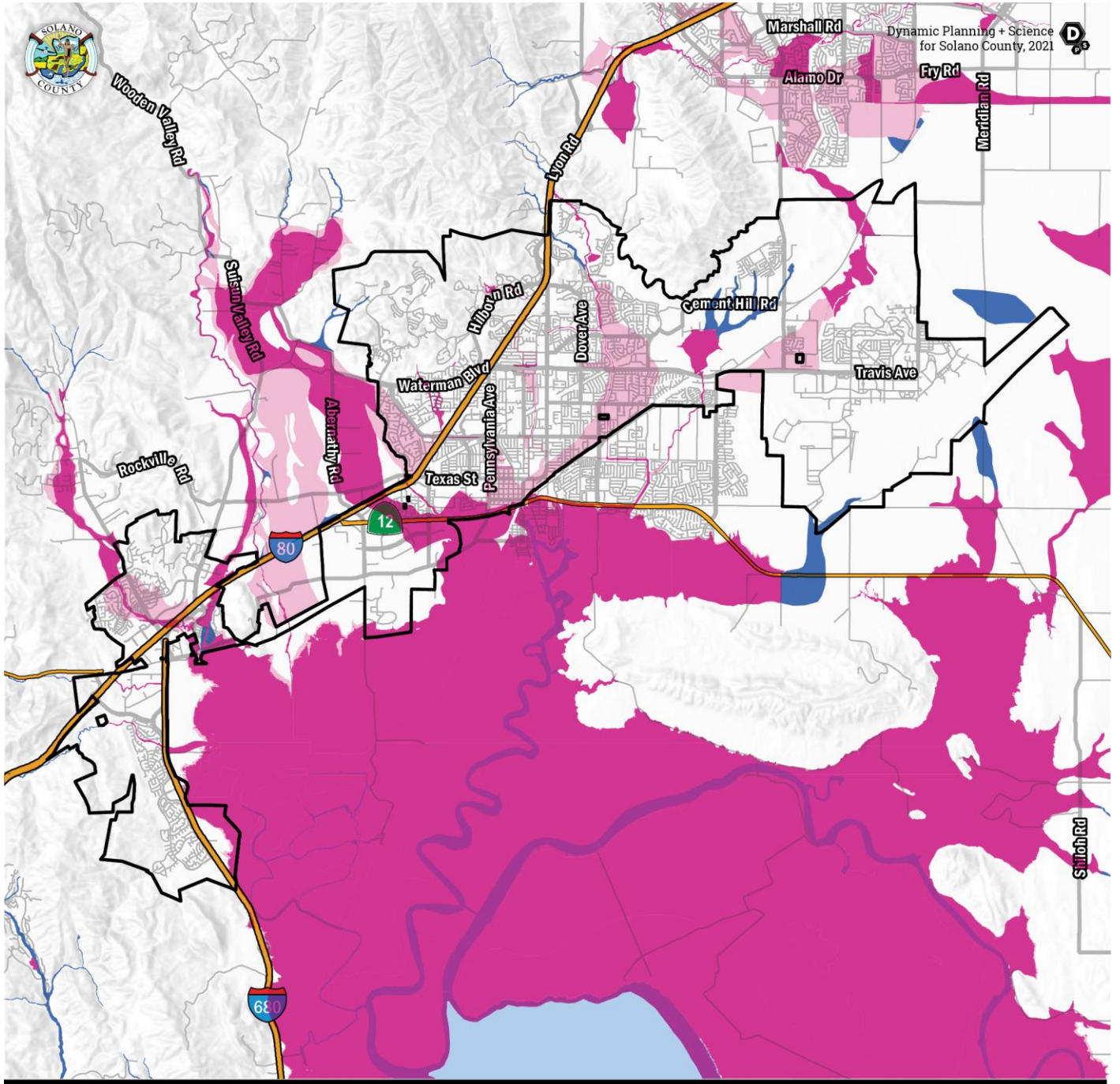
Note: Total Inventory Values

1 - Building Replacement Costs = \$3,773,922,295

2 - Content Replacement Costs = \$2,667,166,517

3 - Total Value = \$6,441,088,812





BAM 200-YR FLOODING AND AWARENESS ZONES FAIRFIELD

*Data sources: DWR.

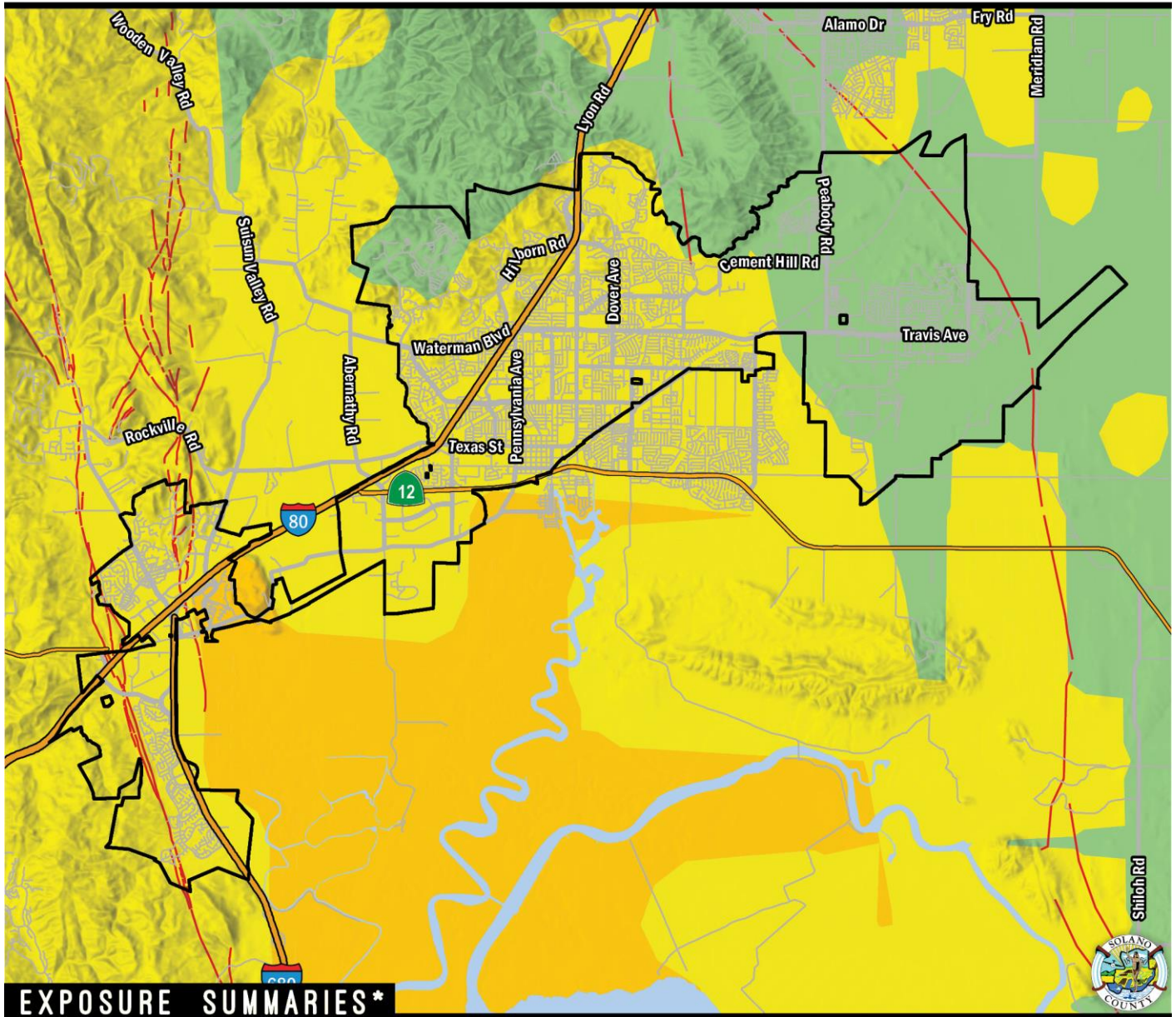
FEMA FLOOD ZONES		DWR AWARENESS ZONES
100-YR (SFHA)	500-YR	
USACE SAC. SAN JOAQUIN R. COMPREHENSIVE STUDY		
100-YR	200-YR	500-YR

Figure 3-6: Fairfield – DWR Best Available Mapping for Flooding



HAYWARD-RODGER'S CREEK EARTHQUAKE SCENARIO (M7.1)

FAIRFIELD



EXPOSURE SUMMARIES*

POPULATION COUNT IN HAZARD AREA

Count	Exp. Rate**
102,445	90%
Count Includes: S+++E	

PARCEL COUNT IN HAZARD AREA

Count	Exp. Rate**
27,685	90%
Count Includes: S+++E	

PARCEL VALUE IN HAZARD AREA

Sum of Improvement Value	Exp. Rate**
\$18,188,058,324	89%
Sum of Content Value	
\$12,039,526,464	89%
Count Includes: S+++E	

CRITICAL INFRASTRUCTURE COUNTS IN HAZARD AREA

Infrastructure Category	Count	Exp. Rate**	Count/Sum Includes:
Essential Facilities	12	80%	S+++E
High Potential Loss	508	88%	Sum of Transportation & Lifeline Linear Mileage
Transportation & Lifeline	574	93%	661 80%

MAP LEGEND



*Exposure summaries include strong, very strong, violent, and severe MMI classes. Hazard data source: USGS.

**Exposure Rate - Exposed summary or count as a percentage of total summary or count within jurisdiction.

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Figure 3-7: Fairfield - Hayward Rodger's Creek EQ Scenario (M7.1) Snapshot



Table 3-6: Fairfield - Hayward Rogers Creek Damage Estimate Summaries

Building Type	Average of Potential Damage to Exceed "Slight"	Average of Potential Damage to Exceed "Moderate"	Average of Potential Damage to Exceed "Extensive"	Average Economic Loss for Each Building Category	Sum of Economic Loss	Proportion of Loss (%)
Agriculture	22%	9%	1%	\$1,264	\$2,527	0%
Commercial	12%	3%	0%	\$130,276	\$95,622,419	33%
Education*	21%	8%	1%	\$32,744	\$130,976	0%
Emergency	8%	2%	0%	\$43,130	\$388,174	0%
Government	8%	2%	0%	\$51,113	\$4,855,755	2%
Industrial	22%	7%	1%	\$215,320	\$54,475,966	19%
Religion	8%	1%	0%	\$25,566	\$1,201,597	0%
Residential	7%	1%	0%	\$4,371	\$129,319,424	45%
Total					\$285,996,838	

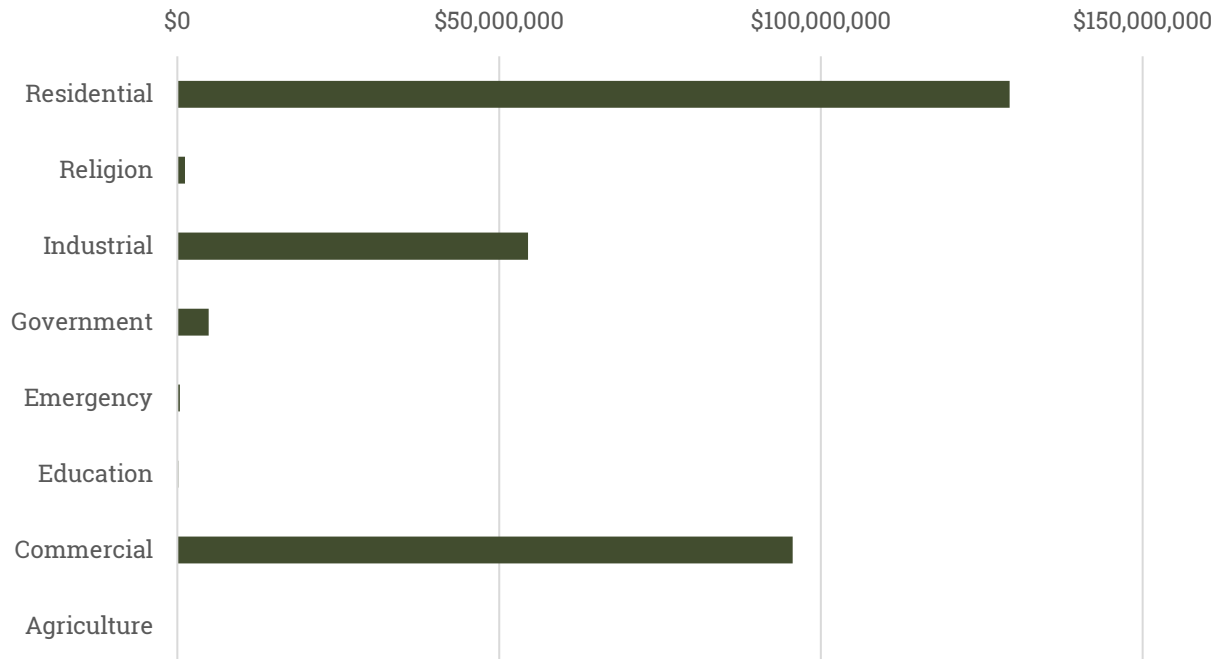
*School district asset information not available during time of Hazus analysis.

Note: Total Inventory Values

1 - Building Replacement Costs = \$3,773,922,295

2 - Content Replacement Costs = \$2,667,166,517

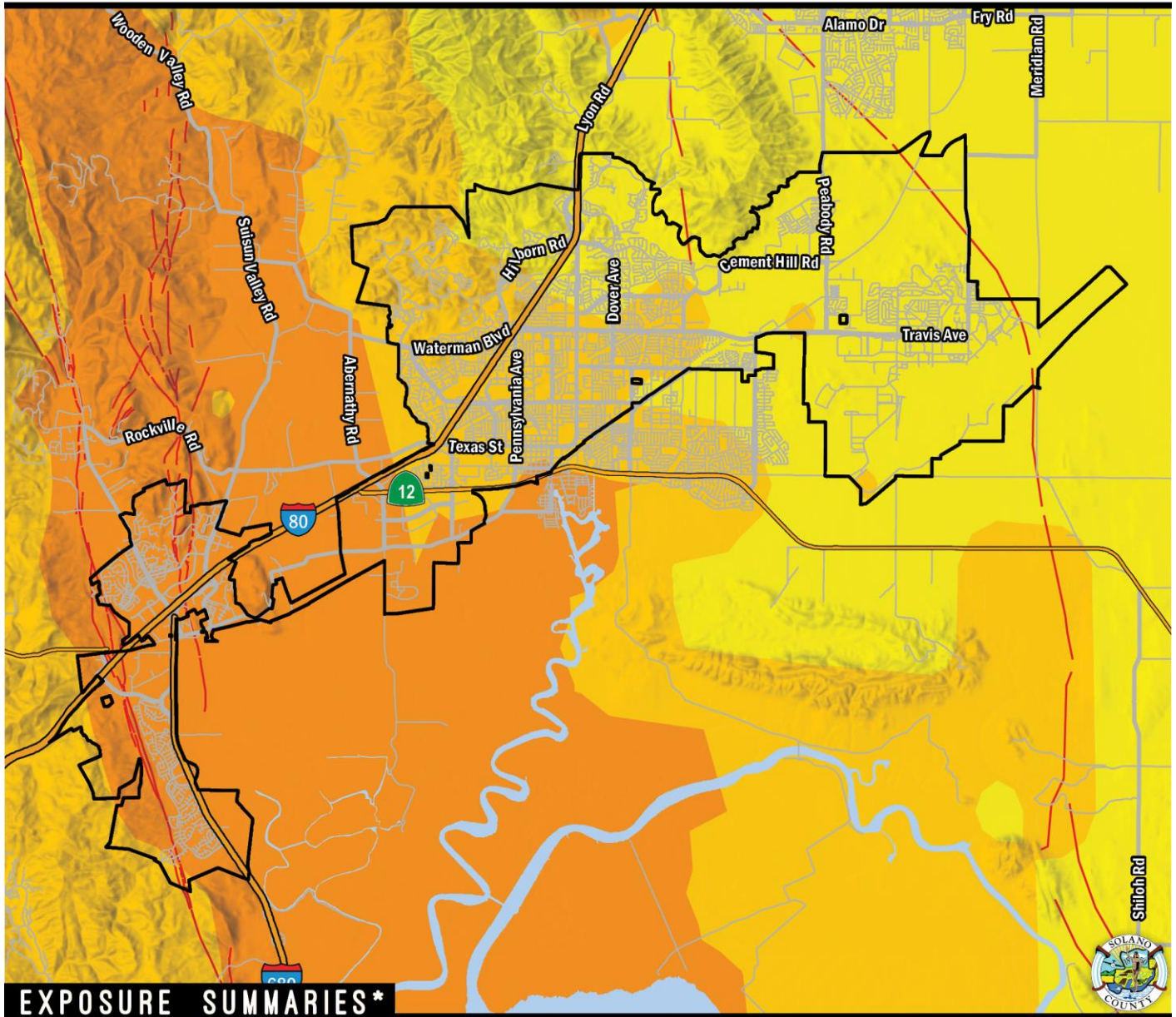
3 - Total Value = \$6,441,088,812





CONCORD-GREEN VALLEY EARTHQUAKE SCENARIO (M6.8)

FAIRFIELD



EXPOSURE SUMMARIES*

POPULATION COUNT IN HAZARD AREA		PARCEL COUNT IN HAZARD AREA		PARCEL VALUE IN HAZARD AREA		CRITICAL INFRASTRUCTURE COUNTS IN HAZARD AREA			
Count	Exp. Rate**	Count	Exp. Rate**	Sum of Improvement Value	Exp. Rate**	Infrastructure Category	Count	Exp. Rate**	Count/Sum Includes:
114,101	100%	30,644	100%	\$20,470,427,213	100%	Essential Facilities	15	100%	S+++E
Count Includes: S+++E		Count Includes: S+++E		Sum of Content Value		High Potential Loss	577	100%	Sum of Transportation & Lifeline Linear Mileage
				\$13,557,102,770	100%	Transportation & Lifeline	614	100%	
				Count Includes: S+++E					100%



*Exposure summaries include strong, very strong, violent, and severe MMI classes. Hazard data source: USGS.
 **Exposure Rate - Exposed summary or count as a percentage of total summary or count within jurisdiction.
 Dynamic Planning + Science for Solano County, 2021

Figure 3-8: Fairfield - Concord Green Valley EQ Scenario (M6.8) Snapshot



Table 3-7: Fairfield - Concord Green Valley Damage Estimate Summaries

Building Type	Average of Potential Damage to Exceed "Slight"	Average of Potential Damage to Exceed "Moderate"	Average of Potential Damage to Exceed "Extensive"	Average Economic Loss for Each Building Category	Sum of Economic Loss	Proportion of Loss (%)
Agriculture	65%	48%	21%	\$4,158	\$8,315	0%
Commercial	42%	15%	3%	\$687,414	\$504,561,844	31%
Education*	56%	30%	6%	\$140,778	\$563,112	0%
Emergency	34%	13%	3%	\$258,116	\$2,323,048	0%
Government	34%	11%	2%	\$315,429	\$29,965,711	2%
Industrial	60%	34%	10%	\$929,864	\$235,255,509	15%
Religion	35%	10%	1%	\$147,927	\$6,952,590	0%
Residential	34%	6%	0%	\$28,059	\$830,223,818	52%
Total					\$1,609,853,946	

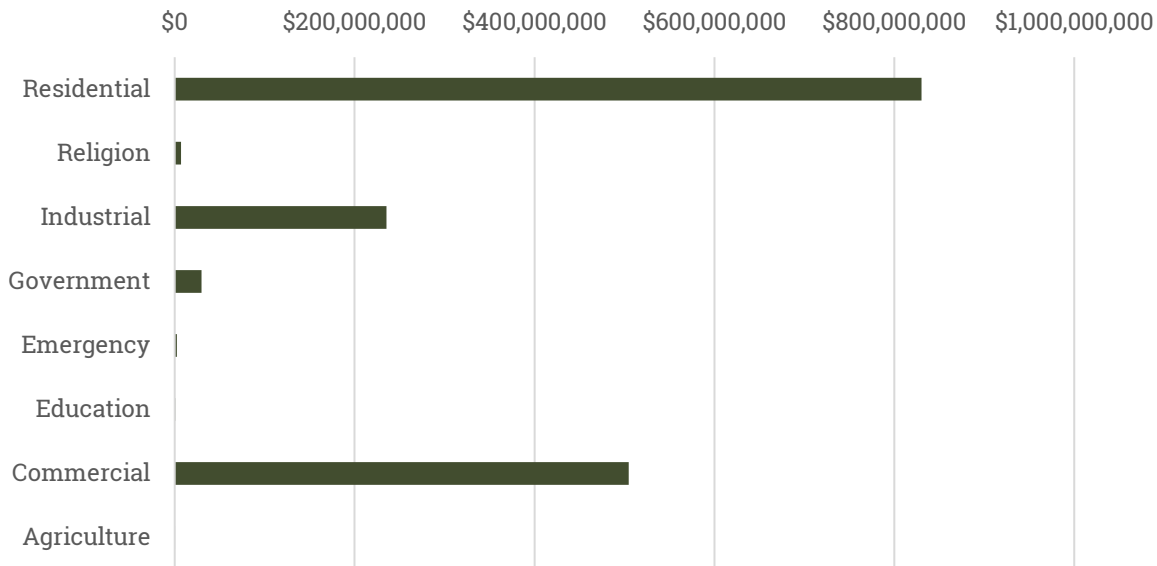
*School district asset information not available during time of Hazus analysis.

Note: Total Inventory Values

1 - Building Replacement Costs = \$3,773,922,295

2 - Content Replacement Costs = \$2,667,166,517

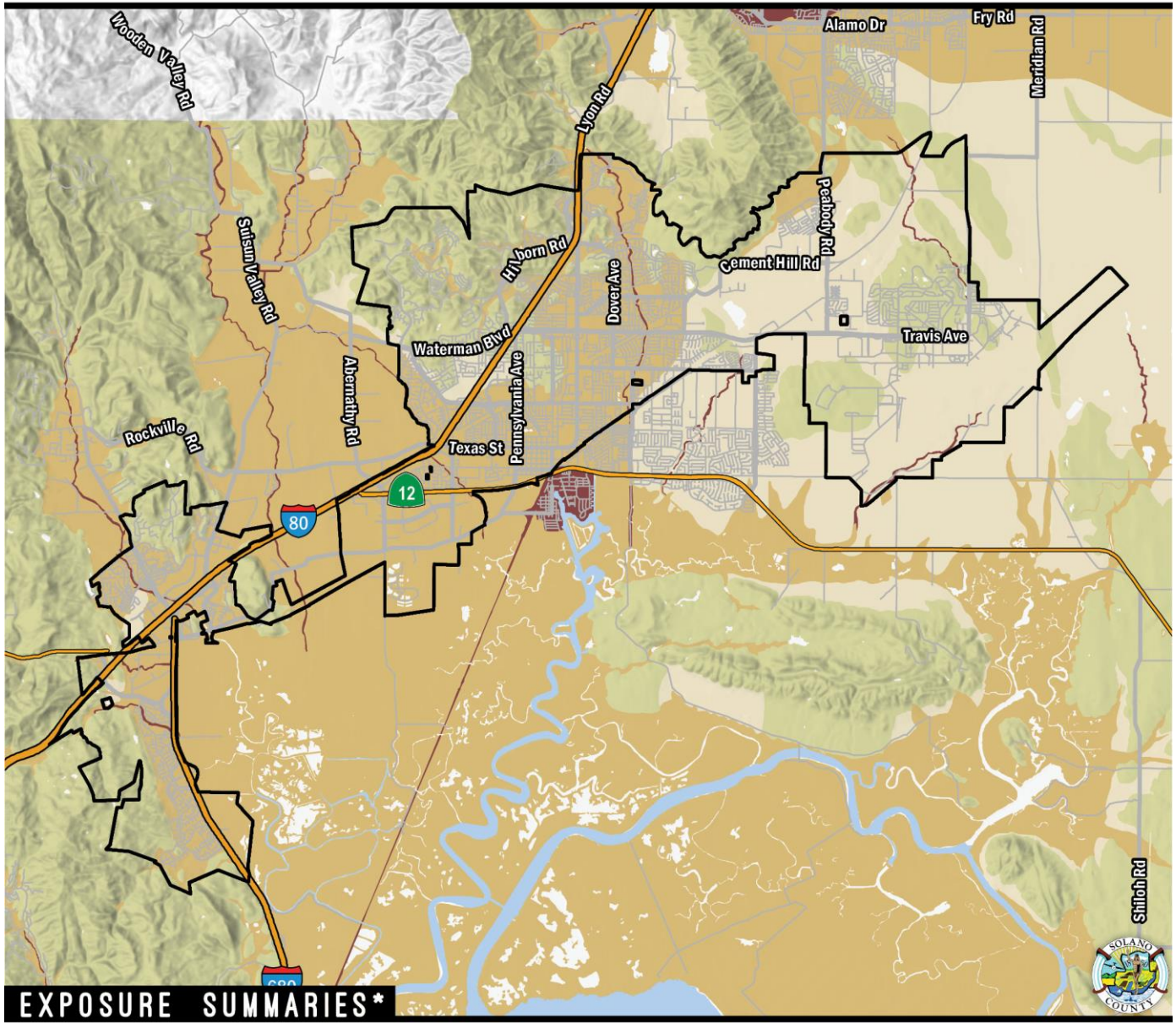
3 - Total Value = \$6,441,088,812





AREAS WITH POTENTIAL FOR LIQUEFACTION

FAIRFIELD



EXPOSURE SUMMARIES *

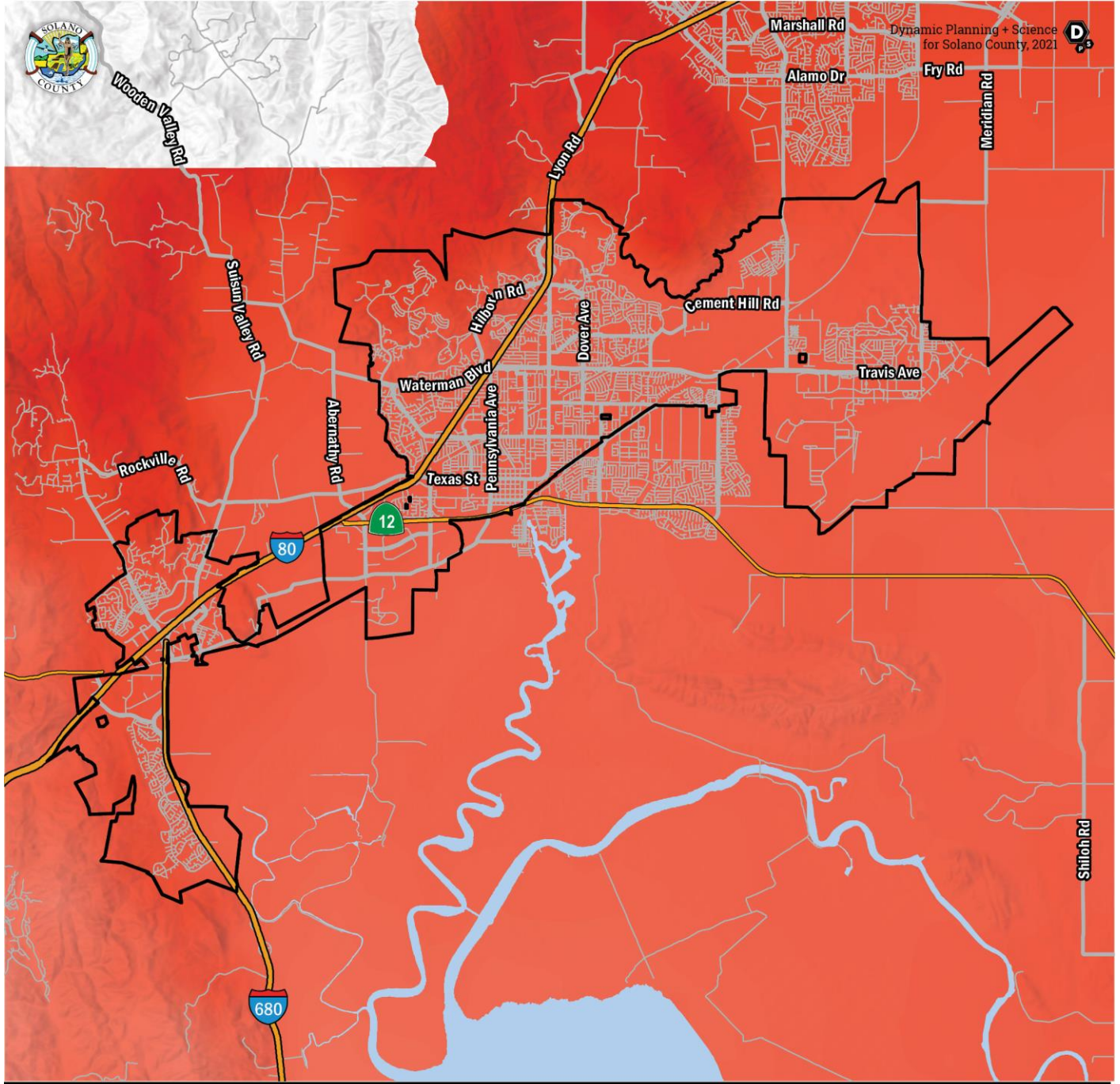
POPULATION COUNT IN HAZARD AREA		PARCEL COUNT IN HAZARD AREA		PARCEL VALUE IN HAZARD AREA		CRITICAL INFRASTRUCTURE COUNTS IN HAZARD AREA			
Count	Exp. Rate**	Count	Exp. Rate**	Sum of Improvement Value	Exp. Rate**	Infrastructure Category	Count	Exp. Rate**	Count/Sum Includes:
72,048	63%	21,026	69%	\$14,209,024,507	69%	Essential Facilities	11	73%	M H VH
Count Includes: M H VH		Count Includes: M H VH		Sum of Content Value		High Potential Loss	367	64%	Sum of Transportation & Lifeline Linear Mileage
				\$9,749,489,893	72%	Transportation & Lifeline	467	76%	
				Count Includes: M H VH					

MAP LEGEND

VL	L	M	H	VH
VERY LIGHT	LIGHT	MODERATE	HIGH	VERY HIGH

*Exposure summaries include medium, high, very high susceptibility. Hazard data source: USGS.
 **Exposure Rate - Exposed summary or count as a percentage of total summary or count within jurisdiction.
 Dynamic Planning + Science for Solano County, 2021

Figure 3-9: Fairfield - Liquefaction Potential

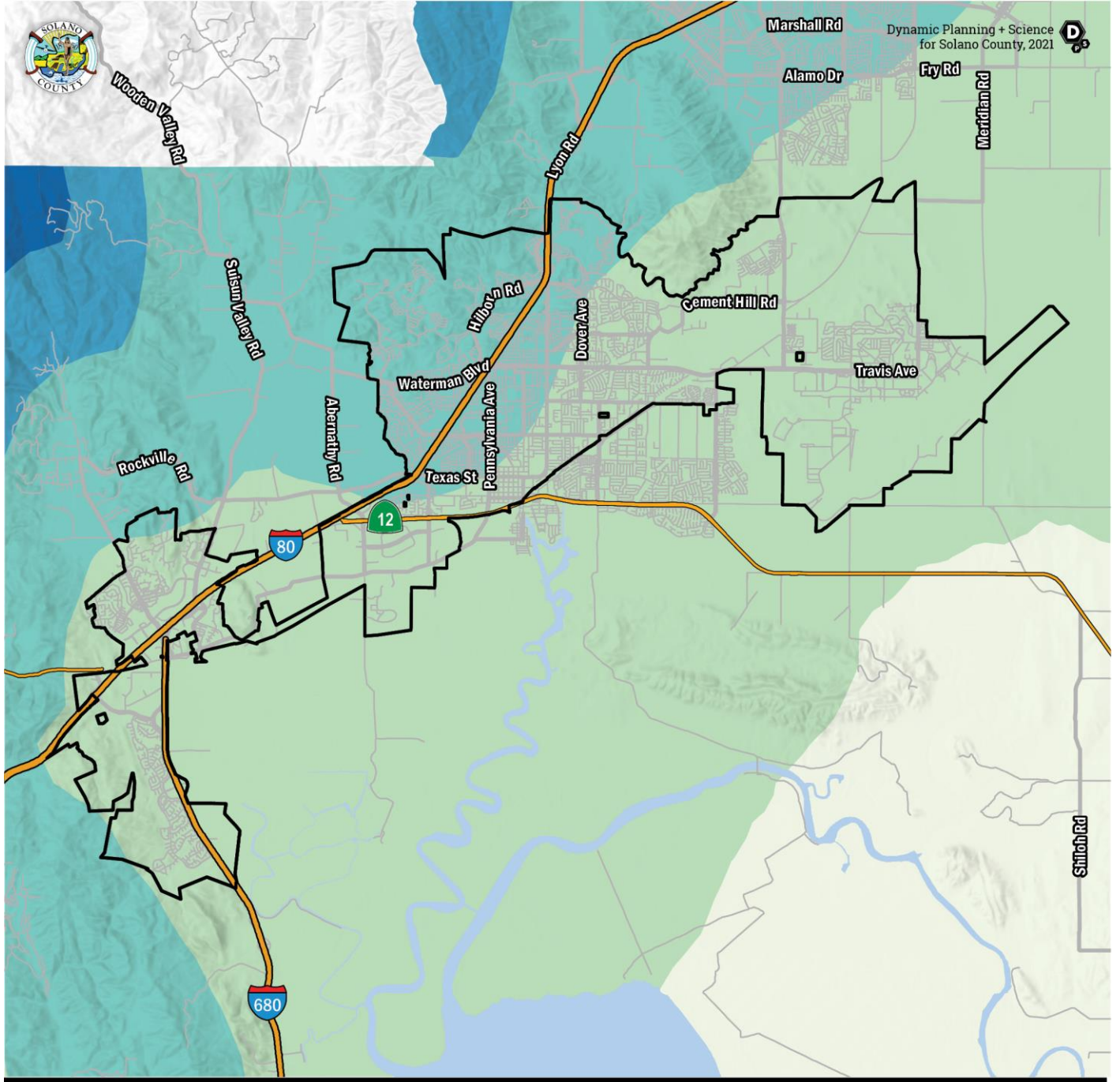


30-YR NORMAL MAXIMUM TEMPERATURE FOR JULY FAIRFIELD

*Data sources: PRISM 800m Resolution 30-YR Normals.



Figure 3-10: Fairfield - July Max Temp

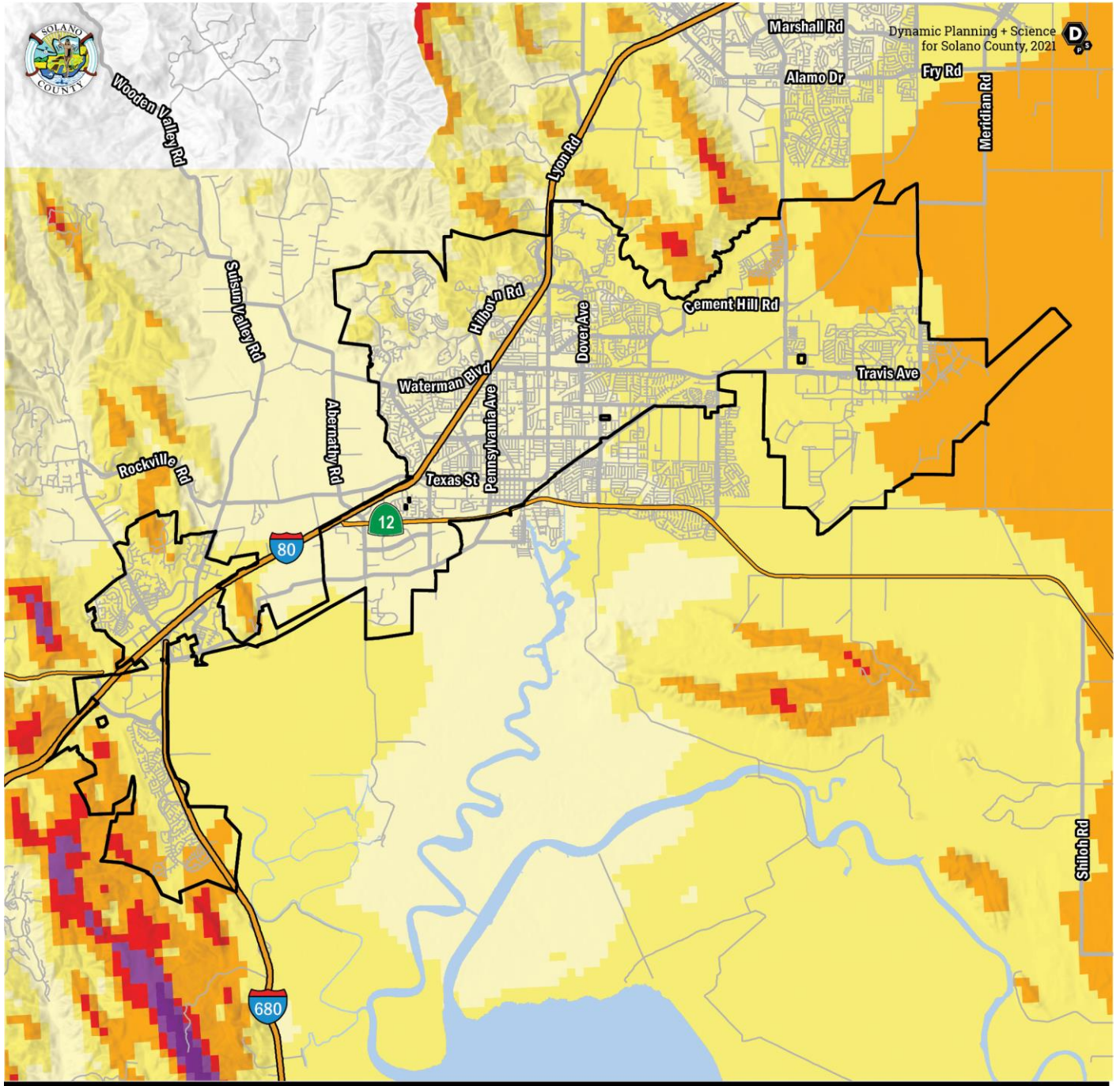


AVERAGE ANNUAL PRECIPITATION (1981-2010, INCHES)
FAIRFIELD

*Data sources: USDA - 1981-2010 Annual Average Precipitation by State.



Figure 3-11: Fairfield - Average Precipitation



**ANNUAL AVERAGE WIND SPEED (POWER CLASS)
FAIRFIELD**

*Data sources: NREL.



Figure 3-12: Fairfield - Wind Speed



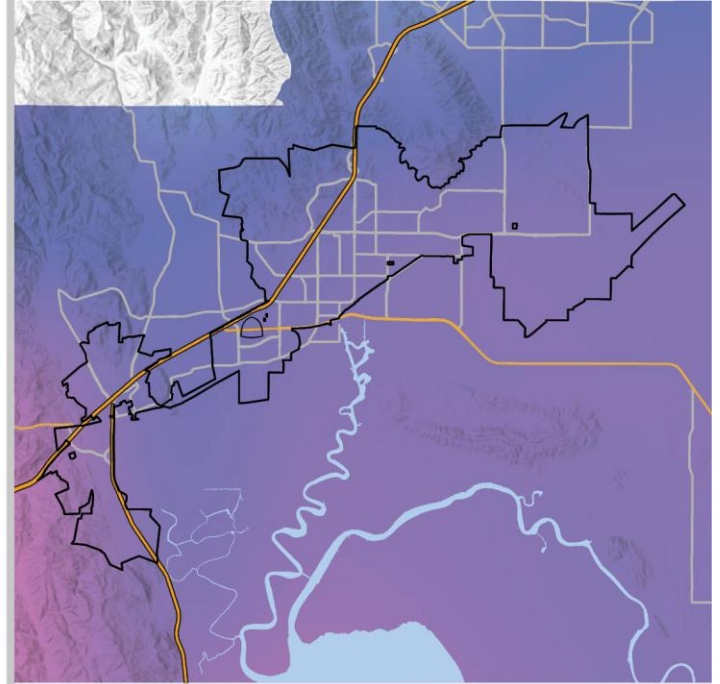
FAIRFIELD

AVERAGE ANNUAL MAXIMUM TEMPERATURE

COMPARISON OF CURRENT OBSERVED TO RCP 4.5 AND RCP 8.5 SCENARIOS



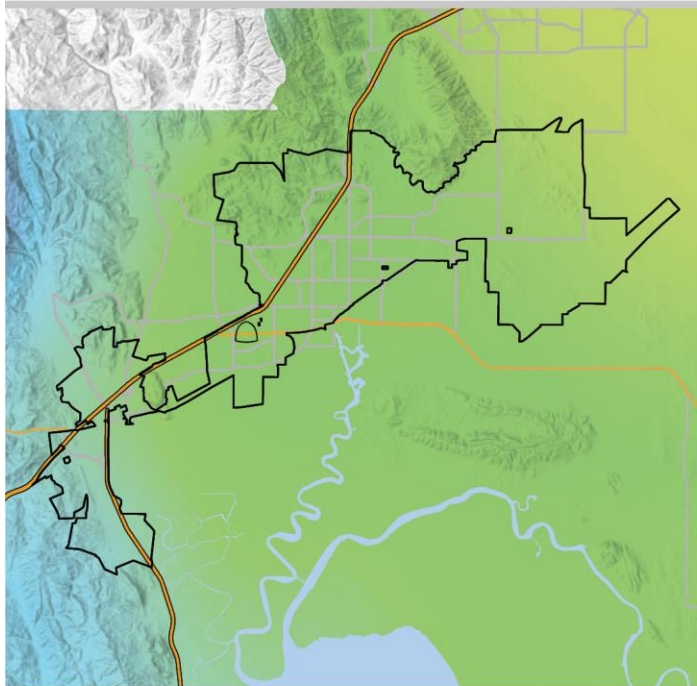
*Data sources: Cal-Adapt CanESM2 RCP 4.5 & 8.5, PRISM 30-YR Norms Annual Max Temp



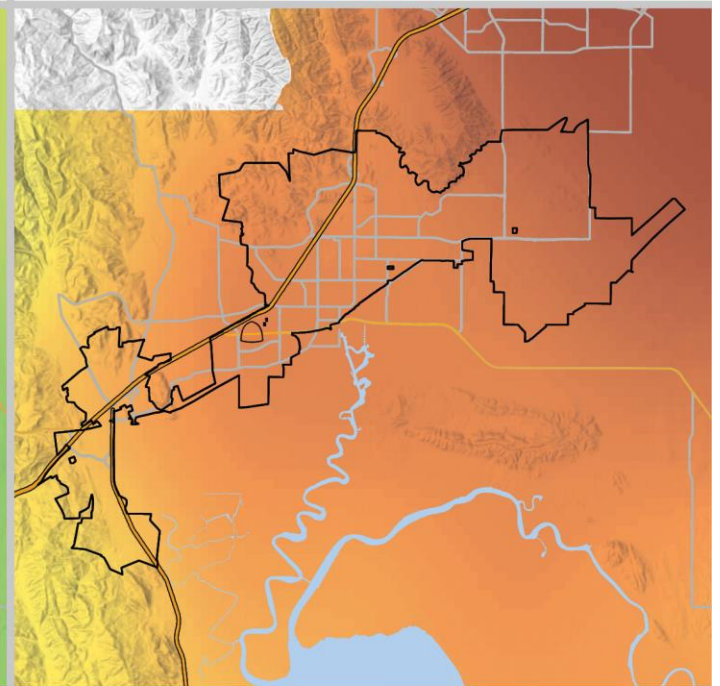
CURRENT 30-YR NORMAL



Dynamic Planning + Science
for Solano County, 2021



RCP 4.5 YEAR 2100



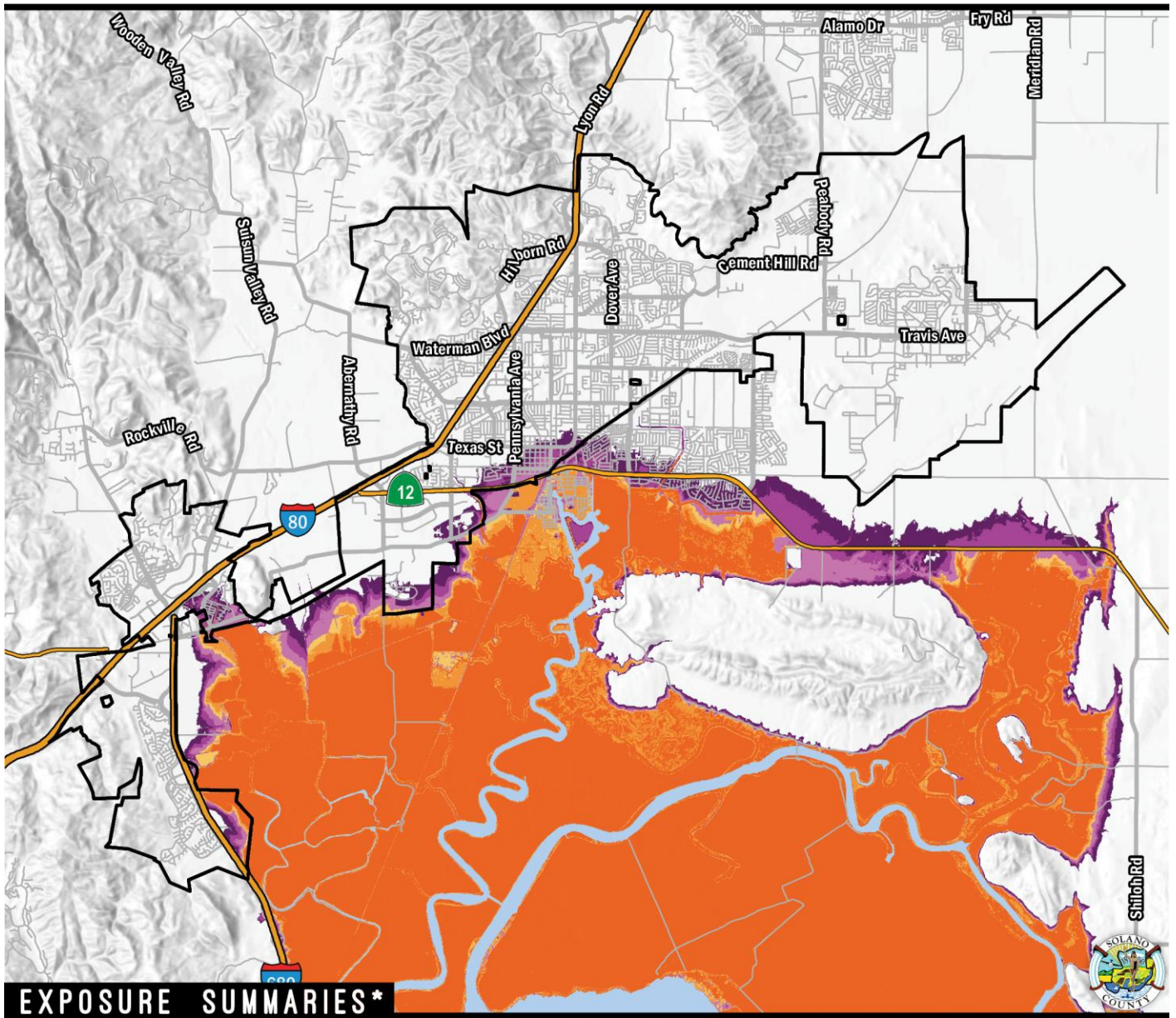
RCP 8.5 YEAR 2100

Figure 3-13: Fairfield - RCP Comparison



SEA LEVEL RISE EXPOSURE

FAIRFIELD



EXPOSURE SUMMARIES *

POPULATION COUNT IN HAZARD AREA	
Count	Exp. Rate**
5,112	4%
Count Includes: L+++E	

PARCEL COUNT IN HAZARD AREA	
Count	Exp. Rate**
856	3%
Count Includes: L+++E	

PARCEL VALUE IN HAZARD AREA	
Sum of Improvement Value	Exp. Rate**
\$581,736,409	3%
Sum of Content Value	
\$435,407,273	3%
Count Includes: L+++E	

CRITICAL INFRASTRUCTURE COUNTS IN HAZARD AREA			
Infrastructure Category	Count	Exp. Rate**	Count/Sum Includes:
Essential Facilities	5	33%	L+++E
High Potential Loss	29	5%	Sum of Transportation & Lifeline Linear Mileage
Transportation & Lifeline	22	4%	

MAP LEGEND	
AMOUNT OF RISE	
EXTREME (2.5M)	INTERMEDIATE (1.0M)
HIGH (2.0M)	INTERMEDIATE LOW (0.5M)
INTERMEDIATE HIGH (1.5)	LOW (0.3M)

*Exposure summaries include scenarios low rise to extreme rise. Hazard data source: NOAA.
 **Exposure Rate - Exposed summary or count as a percentage of total summary or count within jurisdiction.
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Figure 3-14: Fairfield - Sea Level Rise Exposure Snapshot



3.4.3.3 Past and Future Development

The City of Fairfield is a general law city that crafts its own development regulations and is subject to State law. Future development is subject to compliance with state and local planning, zoning, subdivision, and architecture laws.

The City of Fairfield's General Plan (GP) establishes long-range development policies. The GP is designed to help the City address issues related to land use, circulation (traffic), housing, open space, conservation, noise, and safety. The Land Use portion of the plan helps guide the City in determining the location of future development(s), including possible future annexation. In addition to the GP, the City has other plans that guide development in specific areas, including specific plans, policy plans, and master plans. These plans help to shape future development and dictate the City's Sphere of Influence (SOI). One of the central functions in these planning documents is to decrease risk of impact from natural hazards.

Development since Previous HMP

The City considered its growth since the last HMP and determined it had completed several significant mitigation activities and substantially decreased its vulnerability to hazards. The City created a Geologic Hazard Abatement District (GHAD) for paradise valley referred to as the Paradise Valley Maintenance and Monitoring District (PVMMMD) and developed fuel breaks on the Western edge of the City. The City also relocated their Emergency Operations Center (EOC) to the Fire Administration Building enhancing the ability to withstand earthquakes. This HMP Annex has been revised to reflect this substantial change in past development and continues to focus on avenues to better mitigate impacts from problematic past development.

Future Development

City of Fairfield is required to update building codes to meet the minimum standards to those required in the California Building Code last updated in 2019. California Building Codes provide some of the safest construction standards in the world and are meant to reduce risk to occupants from high wind, seismic activity, landslides, flood, wildfire, and other natural hazards. In addition to California minimum development standards, all jurisdictions belong to the NFIP, and all development must meet minimum flood protection standards set forth by FEMA. See Section 4.3.5 of Volume 1 for more information about past and future development in Solano County.

As the General Plan is updated and incorporates information from this HMP, City of Fairfield staff are continually improving hazard information through these hazard mitigation plan updates. With this 2020 update, improved online mapping about natural hazards available on RAMP will inform those responsible for future development to make better decisions where and how future development occurs.

City of Fairfield reviewed its general plans under the capability assessments undertaken for this hazard mitigation plan. See Section 3.5.1. Deficiencies revealed by these reviews are identified as mitigation actions to decrease risks to move beyond past trends.



The City's municipal codes includes regulations to mitigate the impact of hazards on new and existing development, including:

- Drainage and stormwater retention requirements,
- Steep slope restrictions for new development,
- Waterbody buffer requirements,
- Floodplain management regulations,
- Zoning that prevents development in hazardous areas of the community such as floodplains, landslide areas, the wildland-urban interface (WUI), or other known hazard areas, and
- Building codes that include the most up-to-date California Fire Code, seismic standards, and many other provisions crafted to protect new construction from hazard events.

Even in the event that limited development did occur within a hazard area, the municipal code should ensure impacts from a hazard event are mitigated and losses are minimal. If development does occur in hazard areas, evacuation and emergency planning should take into consideration the anticipated local impacts of the hazard event, including potential interrupted services or the elimination of access.

The anticipated growth in the City will not cause significant change in vulnerability to the City for identified priority hazards.

National Flood Insurance Program (NFIP)

The NFIP makes federally backed flood insurance available to homeowners, renters, and business owners in participating communities. FEMA has prepared a detailed Flood Insurance Study (FIS) for Solano County and municipalities. The study presents water surface elevations for floods of various magnitudes, including the 1-percent annual chance flood and the 0.2-percent annual chance flood (the 500-YR flood). Base flood elevations and the boundaries of the 100- and 500-YR floodplains are shown on Flood Insurance Rate Maps (FIRMs), which are the principal tools for identifying the extent and location of the flood hazard. FIRMs are the most detailed and consistent data source available, and for many communities they represent the minimum area of oversight under their floodplain management program. See Section 4 of Volume 1 for general information on the NFIP.

The City of Fairfield has participated in the NFIP since 1984. The City of Fairfield is currently in good standing with the provisions of the NFIP. Compliance is monitored by FEMA regional staff and by the California Department of Water Resources under a contract with FEMA. Maintaining compliance under the NFIP is an important component of flood risk reduction. See Table 3-8 for more information on the City's policies and historic flood insurance claims.

The City of Fairfield also participates in the NFIP Community Rating System (CRS). The City joined the program in 1992 and maintains a rating of 7. Residents purchasing flood insurance under the NFIP in CRS communities receive discounted premiums based on community actions to reduce flood risks. The CRS rating is based on the amount of flood reduction actions taken in the community.



Table 3-8: NFIP Status Table

NFIP and CRS Status & Information	
City of Fairfield	
NFIP Status	07/05/84
CRS Class	7
Policies in Force	187
Policies in SFHA	59
Policies in non-SFHA	128
Total Claims Paid	\$1,096,946
Paid Losses	65
Repetitive Loss Properties	4
Severe Repetitive Loss Properties	-
Repetitive Loss Payment by NFIP on Building	\$320,154
Repetitive Loss Payment by NFIP on Contents	\$88,873

Source: FEMA CIS 2021, OpenFEMA Data, FIMA RUL Solano County

Note: Policies and claims provided directly from FEMA Region IX CIS Report (8/2021). Repetitive loss tabulations by jurisdiction derived via GIS-based intersect of data available at OpenFEMA Data (<https://www.fema.gov/about/openfema/data-sets>). Countywide data reported for entire county area including municipalities. The Privacy Act of 1974 (5 U.S.C. 522a) restricts the release of certain types of data to the public. Flood insurance policy and claims data are included in the list of restricted information. FEMA can only release such data to state and local governments, and only if the data are used for floodplain management, mitigation, or research purposes. Therefore, this plan does not identify the repetitive loss properties or include claims data for any individual property.

See Volume 1, Section 4.5 for more information on the NFIP

3.4.3.4 Identify Hazard Problem Statements

As part of the mitigation action identification process, the Planning Committee for each jurisdiction identified areas of concern (aka problem statements) for their respective facilities based on the risk assessment and vulnerability analysis, utilizing the RAMP mapping and static snapshot maps. Problem statements focused on the impact, victim, or threat that the hazard could create in the jurisdiction, as described in Figure 3-15. Identifying common issues and weaknesses through these problem statements assisted the Planning Committee in understanding the realm of resources needed for mitigation. Jurisdiction problem statements are listed in Table 3-9.

The goal is to have at least one mitigation action for every problem statement. Projects or actions have been developed to mitigate each problem identified. See Table 3-14 for a full list of mitigation actions and corresponding problem statements that they address. Each problem statement is coded with a problem number for cross-referencing between Table 3-9 and Table 3-14.

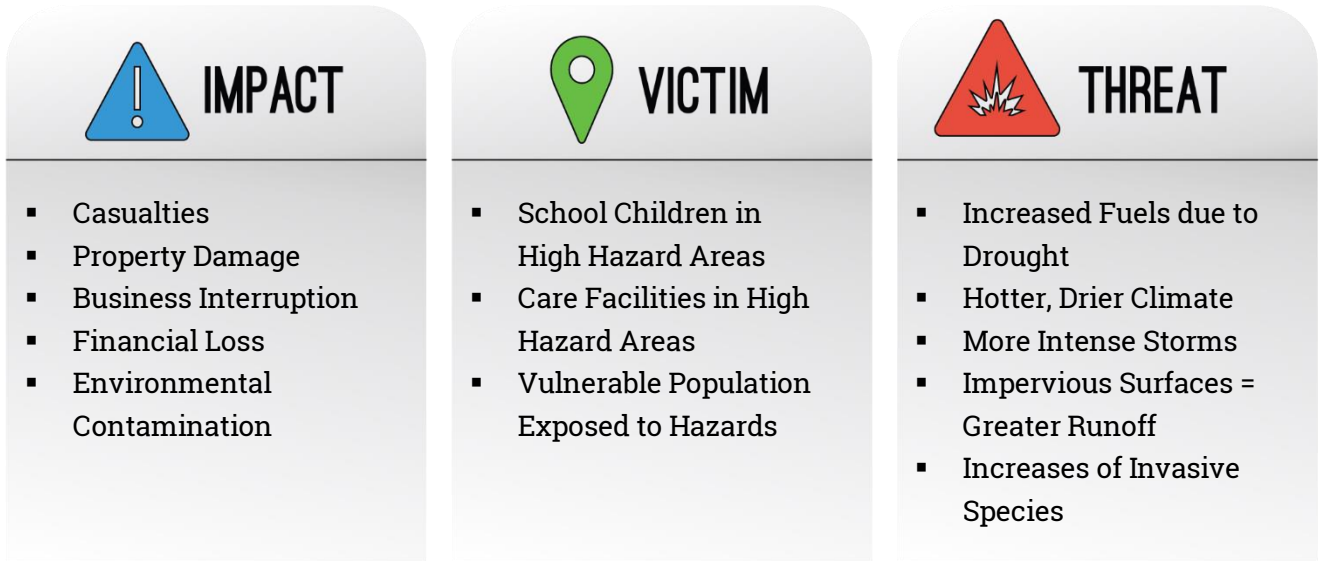


Figure 3-15: Guidance for Problem Statements

Table 3-9: Problem Statements

Problem No.	Hazard Type	Area of Concern	Mitigation Alternatives	Primary Agency	Problem Description	Related MA
ps-AH-FF-136	All Hazard	Impact	PRV - Prevention, PE&A - Public Education & Awareness	City of Fairfield	Train derailment could impact egress within the jurisdiction.	ma-AH-FF-137
ps-FL-FF-137	Flood	Impact	PRV - Prevention, PPRO - Property Protection, PE&A - Public Education & Awareness, NRP - Natural Resource Protection	City of Fairfield	Trash and debris from homeless communities, dams up local creek beds that causes flooding issues from obstructed drainage paths.	ma-FL-FF-181
ps-FL-FF-138	Flood/Climate Change	Impact	PRV - Prevention, PPRO - Property Protection, PE&A - Public Education & Awareness, SP - Structural Projects	City of Fairfield	King tide events are causing more flooding and worsening with climate change.	ma-FL-FF-138



Problem No.	Hazard Type	Area of Concern	Mitigation Alternatives	Primary Agency	Problem Description	Related MA
ps-EW-FF-139	Extreme Weather	Impact	PRV - Prevention, PE&A - Public Education & Awareness, ES - Emergency Services	City of Fairfield	High wind events have been causing tree failure within the jurisdiction.	ma-EW-FF-139
ps-EW-FF-140	Extreme Weather	Impact	ES - Emergency Services	City of Fairfield	Need for more generators throughout the jurisdiction for cooling centers.	ma-EW-FF-140
ps-EW-FF-141	Extreme Weather	Impact	PRV - Prevention, PPRO - Property Protection, NRP - Natural Resource Protection, SP - Structural Projects	City of Fairfield	Heavy rain concerns with flooding in downtown are exacerbated by climate change.	ma-FL-FF-146, ma-FL-FF-138, ma-EW-FF-187
ps-WF-FF-142	Wildfire	Impact	PRV - Prevention, PPRO - Property Protection, PE&A - Public Education & Awareness, ES - Emergency Services	City of Fairfield	Fairfield has small pockets of grasslands that need mitigation.	ma-WF-FF-141
ps-WF-FF-143	Wildfire	Victim	PRV - Prevention, PPRO - Property Protection, PE&A - Public Education & Awareness, ES - Emergency Services	City of Fairfield	Small fires have been jumping into people's backyards causing enhanced risk and potential structural damage.	ma-WF-FF-142
ps-WF-FF-144	Wildfire	Victim	PE&A - Public Education & Awareness, ES - Emergency Services	City of Fairfield	Fairfield is working to bring better coordination throughout the city to ensure ongoing mitigation.	ma-WF-FF-143, ma-WF-FF-142
ps-EQ-FF-145	Earthquake	Impact	PRV - Prevention, PPRO - Property Protection, SP - Structural Projects	City of Fairfield	The city has new and old subgrade and above grade infrastructure with gravity + direct fed water systems. Tanks are all secure however, major earthquakes could significantly damage pumps, storage tanks, and could cause small flooding, resulting in water loss for the fire district.	ma-EQ-FF-144
ps-EQ-FF-146	Earthquake	Impact	PRV - Prevention, PPRO - Property Protection, SP - Structural Projects	City of Fairfield	City owned buildings are old and not retrofitted to appropriate codes.	ma-EQ-FF-145



Problem No.	Hazard Type	Area of Concern	Mitigation Alternatives	Primary Agency	Problem Description	Related MA
ps-EQ-FF-147	Earthquake	Impact	PRV - Prevention, PPRO - Property Protection, PE&A - Public Education & Awareness, ES - Emergency Services, SP - Structural Projects	City of Fairfield	The city has a Clorox chemical plant in the 39th district, a major earthquake could cause a hazardous material spill(s).	ma-EQ-FF-182, ma-EQ-FF-183
ps-EQ-FF-148	Earthquake	Impact	PRV - Prevention, PPRO - Property Protection, PE&A - Public Education & Awareness, ES - Emergency Services, SP - Structural Projects	City of Fairfield	The city has commercial storage warehouses, that contain flammable materials, Cordelia area, this causes a secondary vulnerability with potential fire hazards, because of a major earthquake.	ma-EQ-FF-183

3.4.4 Mitigation Action Support Tool (MAST)

As a living document, hazard problem statements and mitigation activities will be updated through a web interface application developed specifically for participating jurisdictions. The Mitigation Action Support Tool (MAST) is accessible through mitigatehazards.com/SolanoHMP/.

MAST is a web-based interactive tool that enables multiple users to search, view, enter, and update mitigation actions, ideas or projects, and other information. MAST provides participating jurisdictions and plan reviewers (Cal OES/FEMA) access to valuable mitigation information that can be leveraged by future planning or other risk reduction efforts within the County. Participating jurisdictions can update the status of their mitigation projects throughout the planning lifecycle, and this web-based tool will improve participating jurisdiction’s ability to apply for FEMA’s Hazard Mitigation Assistance (HMA) grant programs including initial grant application processes through Cal OES.



3.5 Mitigation Strategy

The mitigation strategy is the guidebook to future hazard mitigation administration, capturing the key outcomes of the MJHMP planning process. The mitigation strategy is intended to reduce vulnerabilities outlined in the previous section (a.k.a. problem statements) with a prescription of policies and physical projects. These mitigation actions should be compatible with existing planning mechanisms and should outline specific roles and resources for implementation success.

3.5.1 Capabilities & Adaptive Capacity Assessment

This section examines the planning and regulatory, administrative, technical, financial, educational, and outreach capabilities to augment known issues and weaknesses from identified natural hazards.

Capabilities assessments in this Volume 1 and in Volume 2 include considerations of a community's adaptive capacity for climate change, as outlined in Cal OES' 2020 California Adaptation Planning Guide. Adaptive capacity is a community or region's existing ability to moderate climate change impacts. Assessing adaptive capacity includes analysis of policies, plans, programs, funding, and staffing capacity.

The tables in this section explore various local planning mechanisms, administrative capacity, financial capabilities, and education and outreach initiatives. The columns in each table represent deeper dives into the following questions:

- Is the existing planning or regulatory mechanism used currently? (Column 1, Status)
- Has the HMP been integrated into the planning mechanism currently so that the named mechanism is currently used in HMP planning? (Column 2, Current Mitigation Use)
- Is there a future opportunity to expand, improve upon, and incorporate this 2020 HMP Update into the planning or regulatory mechanism? (Column 3, Future Opportunity)

The capabilities assessment is easily digestible and based on color coding to indicate which policies and plans are adequate, need improvement or in which the HMP could be integrated. Each table includes a legend that explain how each one of these questions are being answered according to the color indicated: green, yellow, and orange.

For more information on the regulatory environment surrounding each hazard, see hazard-specific sections of Volume 1. Volume 1, Section 5.3.5 includes an extensive list of federal and state funding opportunities as well.



3.5.1.1 Planning and Regulatory Capabilities

Table 3-10: Planning and Regulatory Capabilities

CAPABILITY ASSESSMENT LEGEND		
Status	Current Mitigation Use	Future Opportunity
Currently in use or present.	Used widely for mitigation.	Opportunity to expand and integrate.
(Sort of) Seldomly used or limited presence.	Limited use in mitigation planning.	Limited opportunity to expand and integrate.
(No) Not present or available.	Not used in mitigation planning.	No opportunity to expand or integrate.

Resource	HMP Integration			Notes / Additional Detail
	Status	Current Mitigation Use	Future Opportunity	
Planning and Regulatory Capabilities				
Construction and Future Development Regulations				
Building Codes				2019 California Building Code
Building Code Effectiveness Grading Schedule (BCEGS) Rating	N/A	N/A	N/A	Unknown
Public Protection (ISO Class)				3
Hazard Related Development Standards				Fire Protection, Development Requirements (104.2.2); Establishment of Flood Plain Development Permit (8A.4.1); Provisions for Flood Hazard Reduction, Standards of Construction (8A.5.1)
Hazard-Specific Ordinance				Seismic Hazards Identification Program (5.3.6); Provisions for flood hazard reduction (Article V.)
Zoning Ordinance				
Growth Management Ordinance			N/A	
Hazard Reduction Programs (Annually Conducted)				
Capital Improvements Program (CIP) or Plan				
Erosion/Sediment Control Program				Required for improvement plans
Hazard-Related Public Outreach Program				See Education & Outreach Capabilities for more specifics.
Stormwater Management Program (Annual Inspections)				Fairfield-Suisun Urban Runoff Management Program, Stormwater C.3 Guidebook (2012)
Seismic Safety Program (Non-structural Inspections)				
Earthquake Modernization Program (Building Safety Inspections)				
Hazard Plans				



Resource	HMP Integration			Notes / Additional Detail
	Status	Current Mitigation Use	Future Opportunity	
General Plan Safety Element	Green	Yellow	Yellow	Health and Safety Element 2004; Currently being updated
Noteworthy Area/ Specific Plan with Hazard Focus	Orange	Orange	Green	
Community Wildfire Protection Plan (CWPP)	Orange	Orange	Green	
Wildfire Vulnerability Assessment	Orange	Orange	Green	
Urban or Integrated Regional Water Management Plan	Green	Yellow	Green	2015 Urban Water Management Plan
Floodplain Management Plan	Green	Yellow	Green	See UWMP
Stormwater Management Plan	Green	Yellow	Green	
Ground Water Management Plan(s)	Orange	Orange	Yellow	
Open Space and Land Management Plan(s)	Green	Green	Green	General Plan Element, Parks Master Plan, Rockville Hills Master Plan, participation in Joint Powers Authority for open space issues.
Emergency Operations Plan	Green	Yellow	Green	2017 Solano County Emergency Operations Plan
Climate Action Plan, Vulnerability Ass'mt, or Adaptation Plan	Green	Yellow	Green	2011 Sustainability & Climate Change Plan
Sustainable Community Plan (SB 375)	Yellow	Yellow	Yellow	ABAG Plan Bay Area 2040
Local Delta/ Wetlands Program(s)	N/A	N/A	N/A	
Downtown Plan with hazard focus	Yellow	Yellow	Green	Heart of Fairfield, 2017, discusses flooding
Community Health Assessment(s)	N/A	N/A	N/A	
National Flood Protection Program (NFIP)				
Floodplain Management Regulations	Green	Yellow	Green	Flood Damage Prevention, Statutory Authorization and Findings (8A.1.1)
Flood Insurance Education and Technical Assist.	Yellow	Yellow	Yellow	
Flood Hazard Mapping / Re-Mapping	Green	Yellow	Yellow	Flood Insurance Rate Maps
Community Rating System (CRS)	Green	Yellow	Green	



3.5.1.2 Administrative and Technical Capabilities

Table 3-11: Administrative and Technical Capabilities

CAPABILITY ASSESSMENT LEGEND		
Status	Current Mitigation Use	Future Opportunity
Currently in use or present.	Used widely for mitigation.	Opportunity to expand and integrate.
(Sort of) Seldomly used or limited presence.	Limited use in mitigation planning.	Limited opportunity to expand and integrate.
(No) Not present or available.	Not used in mitigation planning.	No opportunity to expand or integrate.

Resource	HMP Integration			Notes / Additional Detail
	Status	Current Mitigation Use	Future Opportunity	
Administrative and Technical				
Community Planning and Development Services				
Community Planner				Planning Department with several planners All staffing is currently adequate, no hazard mitigation additional staffing is identified; staff can continue to integrate hazard mitigation.
Civil Engineer				Petya McInnis, Associate Civil Engineer
Building Code Official				Jeff Thomas, Chief Building Official
Floodplain Administrator				Director of Public Works, Paul Kaushal
Fire Marshall				Steven Conti, Fire Marshal
Dedicated Public Outreach Personnel				Bill Way
GIS Specialist and Capability				Jasmin Acuna
Emergency Manager				Fire Chief
Grant Manager, Writer, or Specialist				Multiple City staff write grants
Other				
Warning Systems/Services				
General				AlertSolano
Flood				AlertSolano: Flood Risk: California Department of Water Resources Flood Risk Notification Program Flood Control: Solano County Water Agency
Wildfire				AlertSolano
Geological Hazards				AlertSolano ShakeAlert.org (nation-wide)



3.5.1.3 Financial Capabilities

Table 3-12: Financial Capabilities

CAPABILITY ASSESSMENT LEGEND		
Status	Current Mitigation Use	Future Opportunity
Currently in use or present.	Used widely for mitigation.	Opportunity to expand and integrate.
(Sort of) Seldomly used or limited presence.	Limited use in mitigation planning.	Limited opportunity to expand and integrate.
(No) Not present or available.	Not used in mitigation planning.	No opportunity to expand or integrate.

Resource	HMP Integration			Notes / Additional Detail
	Status	Current Mitigation Use	Future Opportunity	
Fiscal Capabilities				
Financial Resources for Hazard Mitigation				
Levy for Specific Purposes with Voter Approval				Many of these fiscal capabilities are not expected to be utilized in the future to fund hazard mitigation; thus the opportunity is limited.
Utilities Fees				
Benefit assessments				Paradise Valley Assessment District
System Development Fee				
Various Bonds to Incur Debt				
Withheld Spending in Hazard-Prone Areas				
Stormwater Service Fees				
Capital Improvement Project Funding				



3.5.1.4 Education and Outreach

Table 3-13: Education and Outreach Capabilities

CAPABILITY ASSESSMENT LEGEND		
Status	Current Mitigation Use	Future Opportunity
Currently in use or present.	Used widely for mitigation.	Opportunity to expand and integrate.
(Sort of) Seldomly used or limited presence.	Limited use in mitigation planning.	Limited opportunity to expand and integrate.
(No) Not present or available.	Not used in mitigation planning.	No opportunity to expand or integrate.

Resource	HMP Integration			Notes / Additional Detail
	Status	Current Mitigation Use	Future Opportunity	
Education / Outreach Capabilities				
Education/Outreach Resources				
Website Dedicated to Hazard Topics				Flood Hazard Information webpage; Disaster Preparedness Links
Dedicated Social Media				Sometimes topical on City website
Hazard Info. Avail. at Library/ Planning Desk				General Plan Hazards Maps are very conceptual in scale and utility.
Annual Public Safety Events				None during COVID-19
Ability to Field Public Tech. Assistance Requests				
Public Safety Newsletters or Printed Outreach				
Fire Safe Councils				
Resource Conservation Districts				Solano Resource Conservation District
Other				

3.5.1.5 Capability and Adaptive Capacity Opportunities

The City of Fairfield identified many opportunities for strengthening community capabilities and adaptive capacity. The City considered this assessment in developing its Mitigation Strategy.

The City is updating its General Plan, which will set the foundation for additional hazard mitigation capacity in the future. The City identified opportunities to revisit code language that could be strengthened for hazard protection and additional outreach and planning opportunities related to wildfire in particular.

Volume 1, Section 5.3.5 includes an extensive list of federal and state funding opportunities to leverage to improve community capabilities.



3.5.2 Mitigation Actions

Mitigation actions were developed based upon the jurisdiction’s priorities, risk assessment results, and mitigation alternatives. The mitigation action prioritization method used by all participating jurisdictions is described in Section 5.5.1 of Volume 1. Table 3-14 lists each priority mitigation action, responsible party, time frame, potential funding source, implementation steps, and resources need to implement based upon the Planning Committee consensus.

Each participating jurisdiction, including the City of Fairfield, considered ongoing relevancy of mitigation actions from the existing MJHMP and retained or removed such actions while adding new relevant actions as well. Mitigation actions were examined for relevancy and the potential for future implementation and then evaluated for potential follow-up. Some mitigation actions developed during the previous HMP effort were not included because they were an inherent part of the HMP update process or were not detailed enough for implementation at a local Jurisdiction level. the City of Fairfield has made significant changes to other mitigation actions because of the updated risk assessment and implementation strategy, to include more detail, or to update based on current mitigation practices. Volume 1, Section 5.5.2 provides a record of County wide mitigation actions, the status, and additional notes for each action.

Table 3-14 lists each mitigation action for the City of Fairfield. Each participating jurisdiction developed unique mitigation actions, targeted at their own unique priorities and vulnerabilities. Each mitigation action identifies the responsible party, time frame, potential funding source, implementation steps and resources needed to implement these priority mitigation actions. As a living document, hazard problem statements and mitigation activities will be updated through MAST. The detail in Table 3-14 meets the regulatory requirements of FEMA and DMA 2000.

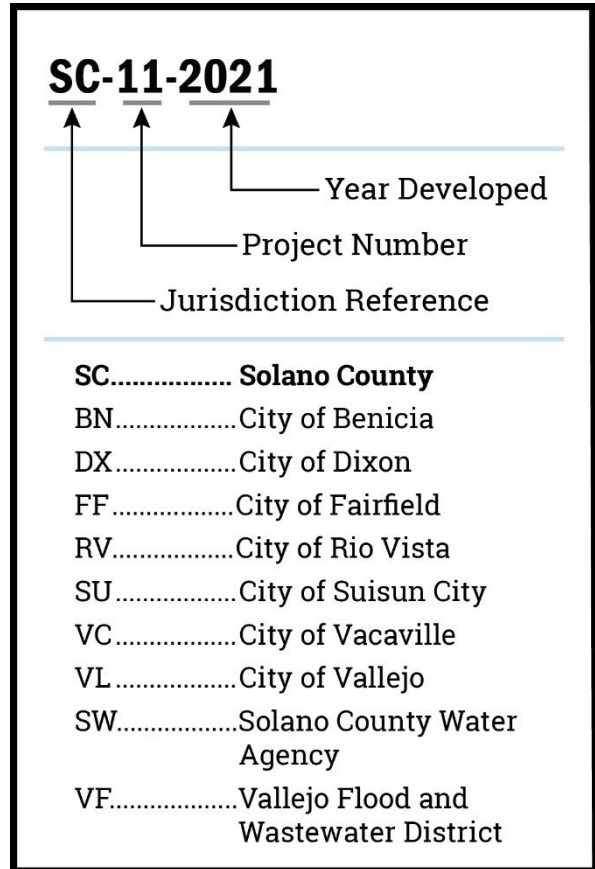


Figure 3-16: Mitigation Action Key

Table 3-14: City of Fairfield Mitigation Actions

Mitigation No.	Hazard Type	Mitigation Type	Status	Year	Primary Agency	Title/Description	Responsible Party	Estimated Cost	Estimated Benefit	Time Frame	HMA Activity Type	Potential Grant Source	Priority	Related Goal(s)	Related Problem Statements
ma-AH-FF-137	All Hazard	ES - Emergency Services	Pending	2021	City of Fairfield	Develop an assessment plan to determine railway points of vulnerability to more accurately predict areas of which would be impacted most during railway damage events.	Fire Department	Medium - The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.	Medium - Project will have a long-term impact on the reduction of risk exposure for life and property, or project will not provide an immediate reduction in the risk exposure for property.	1-3 Years	N/A	EMPG , Internal Funding	Medium	Goal 2: Infrastructure , Goal 4: Resilience	ps-AH-FF-136
ma-AH-FF-193	All Hazard	ES - Emergency Services	Pending	2011	City of Fairfield	Designate and outfit Back-Up Emergency Operations Center	Fire Department	Medium - The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.	High - Project will provide an immediate reduction of risk exposure for life and property.	3-5 Years	Project	HMGP / BRIC , EMPG , Internal Funding	High	Goal 4: Resilience	ps-EW-FF-139, ps-EW-FF-140
ma-EQ-FF-144	Earthquake	SP - Structural Projects	Pending	2021	City of Fairfield	Reinforce local direct fed water systems, tanks, pumps and storage tanks through various protection activities.	City Public Works	Medium - The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.	High - Project will provide an immediate reduction of risk exposure for life and property.	3-5 Years	Project	HMGP / BRIC , FMA , Internal Funding	High	Goal 2: Infrastructure	ps-EQ-FF-145
ma-EQ-FF-145	Earthquake	SP - Structural Projects	Pending	2021	City of Fairfield	Retrofit City-owned critical facilities and buildings.	City Public Works	Medium - The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.	High - Project will provide an immediate reduction of risk exposure for life and property.	3-5 Years	Project	HMGP / BRIC , Internal Funding	High	Goal 2: Infrastructure	ps-EQ-FF-146
ma-EQ-FF-183	Earthquake	ES - Emergency Services	Pending	2021	City of Fairfield	Develop a run book for buildings containing hazardous materials, including hazardous material locations and site map.	Fire Department; Police Department	Low - The project could be funded under the existing budget. The project is part of or can be part of an ongoing existing program.	Medium - Project will have a long-term impact on the reduction of risk exposure for life and property, or project will not provide an immediate reduction in the risk exposure for property.	1-3 Years	N/A	EMPG , Internal Funding	High	Goal 2: Infrastructure , Goal 3: Environment	ps-EQ-FF-148, ps-EQ-FF-147

Mitigation No.	Hazard Type	Mitigation Type	Status	Year	Primary Agency	Title/Description	Responsible Party	Estimated Cost	Estimated Benefit	Time Frame	HMA Activity Type	Potential Grant Source	Priority	Related Goal(s)	Related Problem Statements
ma-EW-FF-139	Extreme Weather	PRV - Prevention	Pending	2021	City of Fairfield	Implement a tree removal program for trees that are at a high risk to snapping in wind events around City facilities and infrastructure.	Fire Department	Medium - The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.	High - Project will provide an immediate reduction of risk exposure for life and property.	3-5 Years	N/A	Internal Funding	Medium	Goal 1: People , Goal 2: Infrastructure	ps-EW-FF-139
ma-EW-FF-140	Extreme Weather	ES - Emergency Services	Pending	2021	City of Fairfield	Install backup power generators to support operation of critical facilities, including water and wastewater systems, emergency services, and cooling and heating centers.	Fire Department; Police Department	Medium - The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.	High - Project will provide an immediate reduction of risk exposure for life and property.	1-3 Years	Project	HMGP / BRIC , EMPG , Internal Funding	Medium	Goal 1: People , Goal 2: Infrastructure , Goal 4: Resilience	ps-EW-FF-140
ma-FL-FF-138	Flood	SP - Structural Projects	Pending	2021	City of Fairfield	Reinforce local ramps, bridges, and roads from flooding, including elevating road(s) and installing culverts beneath roads or building a higher bridge across areas that experiences regular flooding.	City Public Works	Medium - The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.	High - Project will provide an immediate reduction of risk exposure for life and property.	3-5 Years	Project	HMGP / BRIC , FMA , Internal Funding	Medium	Goal 2: Infrastructure	ps-FL-FF-138, ps-EW-FF-141
ma-FL-FF-181	Flood/ Climate Change	PRV - Prevention	Pending	2021	City of Fairfield	Develop an annual drainage maintenance plan including assessing high water marks to assess water depth and settling locations. Including in the plan the clearing of inlets annually (or more often as necessary) prior to monsoon season heavy rain events which are worsening due to climate change.	City Public Works	Low - The project could be funded under the existing budget. The project is part of or can be part of an ongoing existing program.	High - Project will provide an immediate reduction of risk exposure for life and property.	1-3 Years	N/A	FMA , EMPG , Internal Funding	Medium	Goal 2: Infrastructure , Goal 4: Resilience	ps-FL-FF-137
ma-WF-FF-141	Wildfire	PRV - Prevention	Ongoing	2021	City of Fairfield	Develop a community wildfire protection plan (CWPP) that identifies and prioritizes areas for hazard fuel reduction treatments and recommend the types of methods of treatments.	Fire Department	Low - The project could be funded under the existing budget. The project is part of or can be part of an ongoing existing program.	Medium - Project will have a long-term impact on the reduction of risk exposure for life and property, or project will not provide an immediate reduction in the risk exposure for property.	1-3 Years	Planning	HMGP / BRIC , FP&S , Internal Funding	High	Goal 4: Resilience	ps-WF-FF-142
ma-WF-FF-142	Wildfire	PRV - Prevention	Ongoing	2021	City of Fairfield	Develop a wildfire education program in collaboration with local fire entities to conduct a public outreach and education campaign to encourage homeowners to mitigate their properties and vegetation accumulation around their homes.	Fire Department	Low - The project could be funded under the existing budget. The project is part of or can be part of an ongoing existing program.	High - Project will provide an immediate reduction of risk exposure for life and property.	1-3 Years	5%	FP&S , Internal Funding	High	Goal 4: Resilience	ps-WF-FF-143, ps-WF-FF-144

SECTION 4

JURISDICTIONAL ANNEX:

City of Rio Vista



SOLANO COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

[BACK TO ANNEX TABLE OF CONTENTS](#)

FINAL for adoption



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Solano County

Multi-Jurisdiction Hazard Mitigation Plan

CITY OF RIO VISTA (RV.)

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Adoption Resolution

To comply with DMA 2000, the City of Rio Vista has officially adopted this Solano County Multi-Jurisdictional Hazard Mitigation Plan (MJHMP), Volume 1, and its jurisdictional annex. The adoption of the MJHMP recognizes the City’s commitment to reducing the impacts of natural hazards. See included adoption resolution.

RESOLUTION NO. 2022-027

**A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF RIO VISTA ADOPTING THE
UPDATED SOLANO COUNTY MULTI-JURISDICTION HAZARD
MITIGATION PLAN**

WHEREAS, the City of Rio Vista, a political subdivision of the State of California, is an official participating jurisdiction in the updated Solano County Multi-Jurisdiction Hazard Mitigation Plan (“MJHMP”); and

WHEREAS, City of Rio Vista recognizes the updated MJHMP as the official hazard mitigation plan for participating jurisdictions; and

WHEREAS, City of Rio Vista has gathered information and prepared the updated MJHMP in accordance with Federal Emergency Management Agency (FEMA) requirements at 44 CFR § 201.6; and

WHEREAS, Volume 1 of the updated MJHMP recognizes the threat that natural hazards pose to people and property Solano County-wide; and

WHEREAS, City of Rio Vista’s Annex to Volume 1 of the updated MJHMP provides additional information specific to the City of Rio Vista, with a focus on providing additional details on the planning process, risk assessment, and mitigation strategy for this community; and

WHEREAS, City of Rio Vista reviewed Volume 1 of the updated MJHMP and its Annex and affirms that the plan actions in Volume 1 and its Annex should reduce the potential for harm to people and property from future hazard occurrences within the community; and

WHEREAS, the U. S. Congress passed the Disaster Mitigation Act of 2000 (“Disaster Mitigation Act”) emphasizing the need for pre-disaster mitigation of potential hazards; and

WHEREAS, the Disaster Mitigation Act made available, mitigation grants to state and local governments; and

WHEREAS, an adopted hazard mitigation plan is required as a condition of future funding for mitigation projects under multiple FEMA pre- and post-disaster mitigation grant programs; and

WHEREAS, the City of Rio Vista fully participated in the FEMA-prescribed mitigation planning process to prepare this updated MJHMP; and

WHEREAS, the public was afforded opportunities to comment and provide input in the updated MJHMP and the mitigation actions in the Plan; and

WHEREAS, the City of Rio Vista, as a fully participating jurisdiction of the updated MJHMP, is an eligible sub-applicant to the State of California under FEMA’s hazard mitigation grant program guidance; and

WHEREAS, the California Office of Emergency Services (Cal OES), and the FEMA Region IX officials have reviewed the updated MJHMP, and approved it contingent upon this official adoption by the participating governing body; and

WHEREAS, the City of Rio Vista will comply with the requirements of the Disaster Mitigation Act and augment its emergency planning efforts by formally adopting the updated MJHMP; and

WHEREAS, adoption by the City of Rio Vista City Council demonstrates the jurisdiction's commitment to fulfilling the mitigation goals and objectives outlined in this updated MJHMP; and

WHEREAS, adoption of this plan helps to coordinate the responsible agencies to carry out their responsibilities under the updated MJHMP.

NOW THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF RIO VISTA THAT:

1. This City of Rio Vista finds the facts mentioned above to be true and further finds that this City of Rio Vista City Council has jurisdiction to consider, approve, and adopt the subject of this Resolution.
2. This City Council does hereby adopt the updated Solano County Multi-Jurisdiction Hazard Mitigation Plan Volume 1 and its Annex, as approved by FEMA and Cal OES, as the official mitigation plan for City of Rio Vista.
3. This City Council authorizes the Solano County Emergency Services Manager to submit an approved and signed copy of this adoption resolution to the California Office of Emergency Services and FEMA Region IX officials to enable the plan's final approval in accordance with the requirements of the Disaster Mitigation Act of 2000.
4. The City Council finds that the approval of the MHMP is exempt from the California Environmental Quality Act (CEQA), pursuant to CEQA Guidelines section 15262 (feasibility and planning studies) and 15269 (emergency projects).
5. The City Manager is hereby authorized to implement this resolution.

PASSED, AND ADOPTED this 15th of **MARCH 2022**. I, **JOSE JASSO, CITY CLERK OF THE CITY OF RIO VISTA, HEREBY CERTIFY** this foregoing resolution was introduced and passed at a regular meeting of the City of Rio Vista City Council by the following roll call vote:

AYES: Council Members Okamura, Williams, Vice Mayor Dolk and Mayor Kott
NOES: None
ABSENT: Council Member Stanish
ABSTAIN: None

ATTEST:



Jose Jasso, MMC, City Clerk





Section 4. City of Rio Vista

4.1 Purpose

This Annex details the hazard mitigation planning elements specific to the City of Rio Vista. This Annex is not intended to be a standalone document but appends to and supplements the information contained in the umbrella plan document. As such, all sections of the umbrella plan, including the planning process and other procedural requirements apply to and were met by the City of Rio Vista. This Annex provides additional information specific to the City of Rio Vista, with a focus on providing additional details on the planning process, risk assessment, and mitigation strategy for this community.

Hazard Mitigation Plan Points of Contact

Primary Point of Contact

Scott Goodwin, Interim Fire Chief
City of Rio Vista
350 Main St,
Rio Vista, CA 94571
Telephone: (707) 374-2233
e-mail: sgoodwin@ci.rio-vista.ca.us

Alternate Point of Contact

Greg Malcom, Public Works Superintendent
City of Rio Vista
1 Main St,
Rio Vista, CA 94571
Telephone: 707 374 6451
e-mail: gmalcolm@ci.rio-vista.ca.us

4.2 Planning Methodology

The City of Rio Vista followed the planning process detailed in Volume 1, Section 3, including participating in the County Hazard Mitigation Planning Committee (HMPC) and Steering Committee and formulating their own internal planning team to support the broader planning process. Internal planning participants, their positions, and how they participated in the planning process are shown in Table 4-1.

Table 4-1: Planning Committee Members

Planning Committee Members	Department
Scott Goodwin	Interim Fire Chief
Greg Malcom	Public Works Superintendent
Jackson Harris	Police Chief
Jose Jasso	Assistant City Manager/City Clerk
Robin Borre	Director of Public Works
Rob Hickey	City Manager
Beth Roberts	Recreation and Facilities Manager

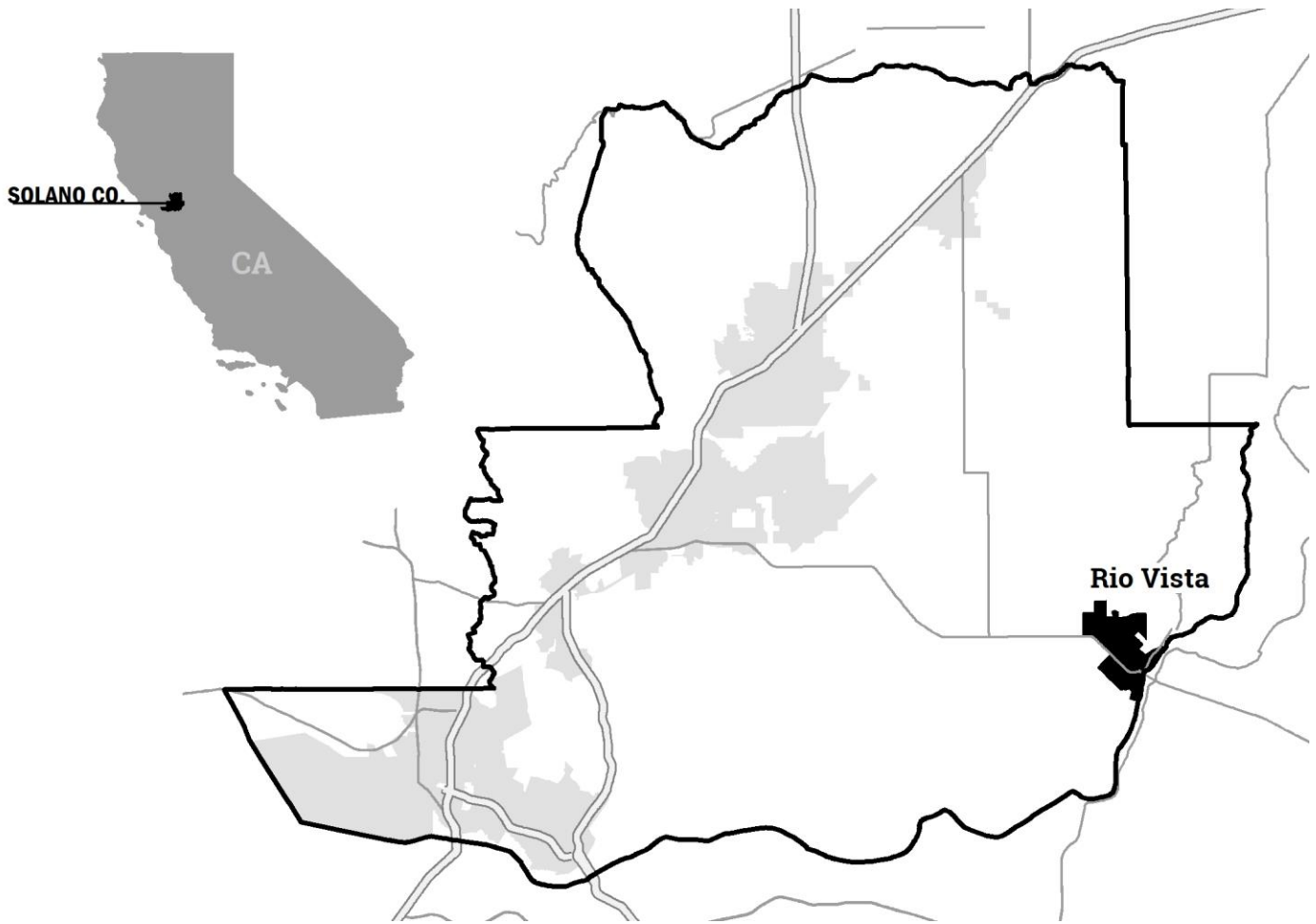


Figure 4-1: City of Rio Vista Location

4.3 What's New

The City of Rio Vista has not had a hazard mitigation plan since participating in the 2011 Association of Bay Area Governments MJHMP. Because the City's annex to the ABAG Plan is so old, the Planning Committee elected to not include any of the mitigation actions from the earlier plan in this MJHMP. Starting fresh will ensure that the City's mitigation strategy addresses its most pressing current vulnerabilities. The City's efforts to incorporate hazard mitigation into other planning mechanisms are documented in Section 1.5.1, the Capabilities Assessment.



Rio Vista Flood Control Feasibility Study. The Rio Vista Flood Control Feasibility Study was published in 2020 with guidance from the City of Rio Vista, the Solano County Water Agency, the Department of Water Resources, the Sacramento Area Flood Control Agency, the California Department of Transportation, and the Solano County Transportation Authority.

The goal of the study is to identify a preferred alternative to reduce the risk of flooding in Rio Vista that is compatible with local and state-level planning documents.

4.4 Risk Assessment

The intent of this section is to profile the City of Rio Vista’s hazards and assess the City’s vulnerabilities, distinct from that of the County wide planning area. The hazard profiles in Volume 1 discuss overall impacts to the planning area and describes the hazard problem description, hazard extent, magnitude/severity, previous occurrences of hazard events and the likelihood of future occurrences. For more information on Risk Assessment Methodologies, see Vol. 1 and Appendix A.

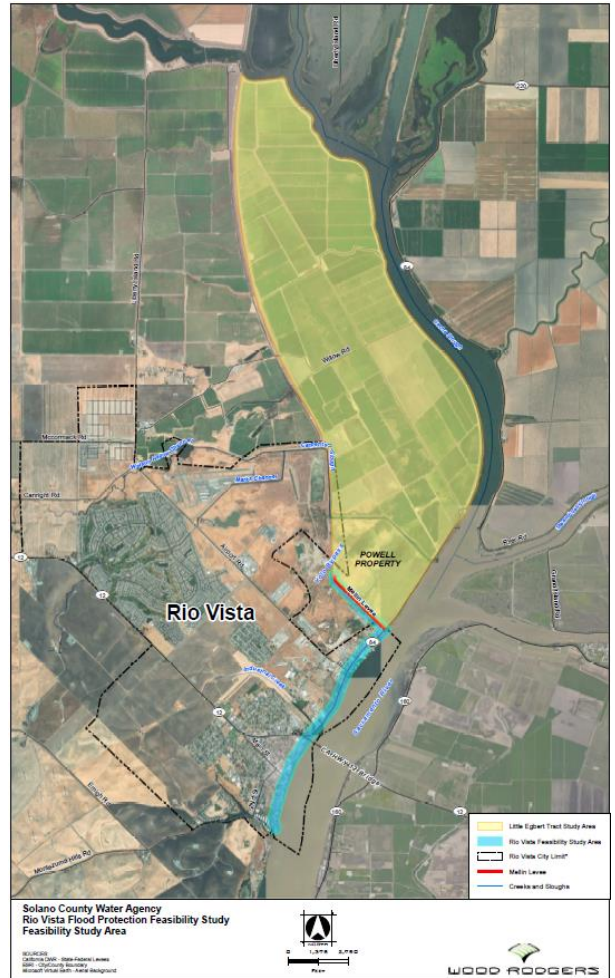


Figure 4-2: Rio Vista Feasibility Study Area
Source: CAL FIRE

4.4.1 Hazard Screening Criteria

Planning Team members from each participating jurisdiction collectively discussed which hazards should be profiled in the Plan and which should not. The results of that discussion can be found in Table 4-2. Detailed hazard profiles of the most significant County wide hazards are described in Section 4 of Volume 1. The Planning Team reviewed previously prepared hazard mitigation plans and other relevant documents to determine the realm of natural hazards that have the potential to affect the City of Rio Vista. Table 4-3 provides a crosswalk of hazards identified in Vol. 1 of this plan, the City of Rio Vista General Plan, and 2018 California State Hazard Mitigation Plan. The crosswalk was used to develop a preliminary hazards list, providing a framework for the Planning Team members to evaluate which hazards were truly relevant to the City of Rio Vista and which ones were not. Section 4.4.2 below describes the hazard risk ranking process that was performed by the planning team which prioritized hazards that are specifically relevant to the City of Rio Vista.



Table 4-2: County-Wide Hazard Prioritization

Hazard Type	Explanation
Climate Change	High priority county-wide, profiled hazard.
Dam/ Levee failure	Dam failure is possible in Solano County but is best addressed in other plans, specifically Emergency Action Plans for high hazard dams affecting Solano County.
Drought	High priority county-wide, profiled hazard.
Earthquake/ Geologic Hazards	High priority county-wide, profiled hazard.
Flood	High priority county-wide, profiled hazard.
Hazardous Material	While hazardous materials can release and impact the County, there are better avenues to address this hazard outside this plan.
High Winds/ Straight Line Winds	High priority county-wide, profiled as part of Extreme Weather.
Insect Hazards	While hazardous insects exist in Solano County, this was not considered a priority and is not profiled in this plan.
Pandemic Disease	While pandemic disease can impact the County, there are better avenues to address this hazard outside this plan.
Extreme Weather, including:	High priority county-wide for high wind, heavy rain, and high heat.
Extreme Heat	Profiled as part of Extreme Weather.
Hail	Hail events are rare and not considered a priority.
High Wind	Profiled as part of Extreme Weather.
Heavy Rain	Profiled as part of Extreme Weather.
Fog	Fog events are rare and are not considered a priority.
Lightning	Not a priority as an extreme weather event; discussed as source of wildfire.
Severe Thunderstorm	Severe thunderstorms were not identified as a priority in this plan.
Winter Storm / Extreme Cold/ Freeze Events	Winter storms are rare in Solano County and not identified as a priority for this plan.
Slope Failure	High priority county-wide, profiled hazard.
Soil Hazards	While limited soil hazards exist in Solano County (erosion and shifting soils), these are not prioritized in this plan. Erosion discussed under flood hazard.
Terrorism/Human Caused Threats	While terrorism is certainly a threat to the County and participating jurisdictions, it is best addressed in other plans as this HMP does not address human-caused threats.
Tornado	Impacts to the County from tornados are extremely unlikely, if any.
Volcanic Activity	Due to distance from volcanoes and the limited chance of an eruption, this hazard was not identified as a priority.
Wildfire	High priority county-wide, profiled hazard.



Table 4-3: City Document Review Crosswalk

Hazards	2001 Rio Vista General Plan	2010 Rio Vista LHMP Annex	2014 Solano County HMP	2018 California State HMP
Agricultural Pests				■
Climate Change			■	■
Dam Failure			■	■
Drought		■	■	■
Earthquake	■	■	■	■
Flood	■	■	■	■
Landslide	■	■	■	■
Levee Failure				■
Man made Hazards				■
Pandemic Disease				■
Sea Level Rise			■	■
Severe Weather		■	■	■
Soil Hazards	■			■
Terrorism & Tech Hazards				■
Tsunami				■
Volcano				■
Wildfire	■	■	■	■

4.4.2 Hazard Risk Ranking

The City of Rio Vista’s Planning Team used the same hazard prioritization process as the Solano County Hazard Mitigation Planning Committee. This process is described in detail in Section 4.3.1 of Vol. 1. Figure 4-3 displays the results of the hazard risk ranking exercise that was performed by the Planning Team. The Planning Team chose to assess the City of Rio Vista’s vulnerability to the following hazards:

- Wildfire
- Flood
- Earthquake
- Extreme Weather (high wind)
- Drought
- Climate Change

All of these hazards have been profiled in Vol. 1 of this document. The purpose of this annex to specifically address the City of Rio Vista’s vulnerability to these specifically-identified hazards.

4.4.3 Vulnerability Assessment

Assessing vulnerabilities exposes the unique characteristics of individual hazards and begins the process of narrowing down which areas within the City of Rio Vista are vulnerable to specific hazard events. The vulnerability assessment considered unique local knowledge of hazards and impacts and a GIS overlaying method for examining such vulnerabilities more in depth. Using these methods, participating jurisdictions estimated vulnerable populations, infrastructure, and potential losses from hazards.



4.4.3.1 Risk Assessment

Each participating jurisdiction developed a risk matrix that assessed the probability and impact of various hazards within the jurisdiction. Figure 4-3 is the jurisdiction's risk assessment, which was completed in part using the web based and interactive Risk Assessment Mapping Platform (RAMP), accessed via the project website at www.mitigatehazards.com. RAMP allows interactive discovery of robust risk, vulnerability, and exposure data developed especially for Solano County. RAMP is a mapping platform built specifically for mitigation planning. It displays County/jurisdiction facilities and buildings overlaid with natural hazards layers to bring interactivity and individual discovery to the GIS analysis performed for the MJHMP. See Vol. 1 for a detailed description of RAMP. The Planning Team used RAMP in meetings and as needed to understand vulnerabilities to the City of Rio Vista. Users interactively filter facilities and buildings by natural hazard zones and/or construction characteristics. The City of Rio Vista also conducted a more detailed climate vulnerability assessment, included as Appendix A to this annex. The climate vulnerability assessment analyzed climate-related vulnerabilities by considering the impact from the climate vulnerability and the community's adaptive capacity to respond to the particular vulnerability.

4.4.3.2 Snapshot Exposure Maps and Damage Estimation

The included snapshot maps and damage estimation tables illustrate the City of Rio Vista's vulnerability to specific hazards. Based on the above risk assessment, the snapshot maps focus on those hazards prioritized by the jurisdiction. These maps helped the Planning Team understand the exposure of population, parcels, and critical infrastructure to specific hazards. Each map contains an exposure summary that displays the percent of the population, the improvement and content value of parcels, and the amount of critical infrastructure that is exposed to each respective hazard. For flood and earthquake, detailed damage estimations were conducted through FEMA's Hazus software and are shown in tabular form. Additional mapping is also included. Figures and tables include:

- Figure 4-4: City of Rio Vista – Mean Fire Return Interval
- Figure 4-5: City of Rio Vista – Wildfire Risk Exposure
- Figure 4-6: City of Rio Vista– FEMA Flood Risk Exposure
- Table 4-4: City of Rio Vista - Damage Estimate Summaries, 100YR Flood
- Table 4-5: City of Rio Vista - Damage Estimate Summaries, 500YR Flood
- Figure 4-7: City of Rio Vista - Area Protected by Levee (NLD) Exposure
- Figure 4-8: City of Rio Vista– BAM 200-YR Flooding and Awareness Zones
- Figure 4-9: City of Rio Vista– Concord Green Valley EQ Scenario (M6.8)
- Table 4-6: City of Rio Vista - Concord Green Valley Damage Estimate Summaries
- Figure 4-10: City of Rio Vista– Hayward Rodger's Creek EQ Scenario (M7.1)
- Table 4-7: City of Rio Vista - Hayward Rodger's Creek Damage Estimation Summaries
- Figure 4-11: City of Rio Vista– Areas with Potential for Liquefaction
- Figure 4-12: City of Rio Vista– Annual Average Wind Speed (Power Class)
- Figure 4-13: City of Rio Vista– Drought Severity Timeline – Lower Sacramento
- Figure 4-14: City of Rio Vista– RCP Comparison



Risk Assessment Matrix Definitions

PROBABILITY RATING

The likelihood of a hazard event occurring within a time period?

PROBABILITY	Highly Likely	Highly likely - 100% annual probability. Or likely to occur every year in your lifetime.
	Likely	Likely - Between 10 and 100% annual probability. Or will occur several times in your lifetime.
	Possible	Possible - Between 1 and 10% annual probability. Or likely to occur some time in your lifetime.
	Unlikely	Unlikely - Less than 1% annual probability. Or unlikely but possible to occur in your lifetime.

IMPACT RATING

In terms of injuries, damage, or death, would you anticipate impacts to be minor, limited, critical, or catastrophic when a significant hazard event occurs? The impact could be in terms of one hazard event (flooding from a culvert failure) or a large-scale event (multiple rivers flooding) in the same jurisdictional boundary.

IMPACT			
Minor	Limited	Critical	Catastrophic

- Minor** - Very few injuries, if any. Only minor property damage and minimal disruption on quality of life. Temporary shutdown of critical facilities.
- Limited** - Minor injuries only. Approx. 10% or less of property in disaster footprint damaged or destroyed. Complete shutdown of critical facilities for more than one day.
- Critical** - Multiple deaths/injuries possible. Between 25% and 50% of property in disaster footprint is damaged or destroyed. Complete shutdown of critical facilities for more than one week.
- Catastrophic** - High number of deaths/injuries possible. More than 50% of property in affected area damaged or destroyed. Complete shutdown of critical facilities for 30 days or more.

To concentrate resources on highest priority hazards, the jurisdictional planning team will focus on "High" and "Extreme" risk hazards in this annex. These hazards have higher probability and greater impact as it relates to the jurisdiction's planning area.

Hazard definitions are included in Vol. 1 of this plan.

Hazard Information / Legend:



Climate Change is prioritized for all jurisdictions.



Sea-Level Rise is a subhazard of climate change for some jurisdictions (County, Vallejo, Benicia, Suisun City, Fairfield).



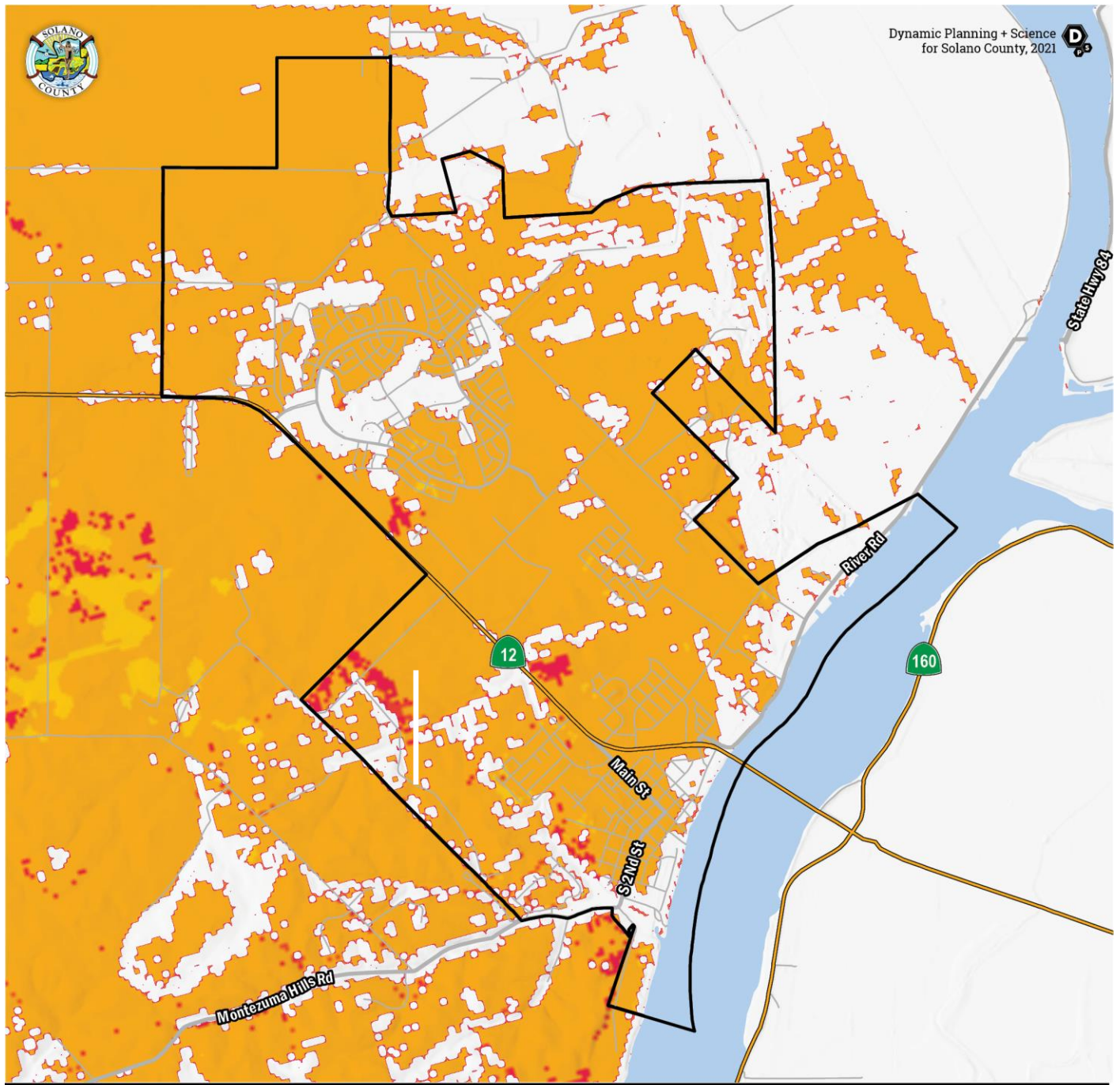
Extreme Weather in Solano County includes high heat, high wind, and heavy rain.

If a hazard symbol is grey, the planning team did not develop hazard vulnerability information due to lower perceived probability and impact.

City of Rio Vista Risk Matrix

		IMPACT			
		Minor	Limited	Critical	Catastrophic
PROBABILITY	Highly Likely	Medium	WILDFIRE	Extreme	Extreme
	Likely	Medium	EXTREME WEATHER DROUGHT	FLOOD	Extreme
	Possible	Low	Medium	EARTHQUAKE	High
	Unlikely	SLOPE FAILURE	Low	Medium	Medium

Figure 4-3: City of Rio Vista – Risk Assessment



MEAN FIRE RETURN INTERVAL RIO VISTA

*Data sources: USGS LANDFIRE.

AVERAGE PERIOD BETWEEN FIRES (YEARS)

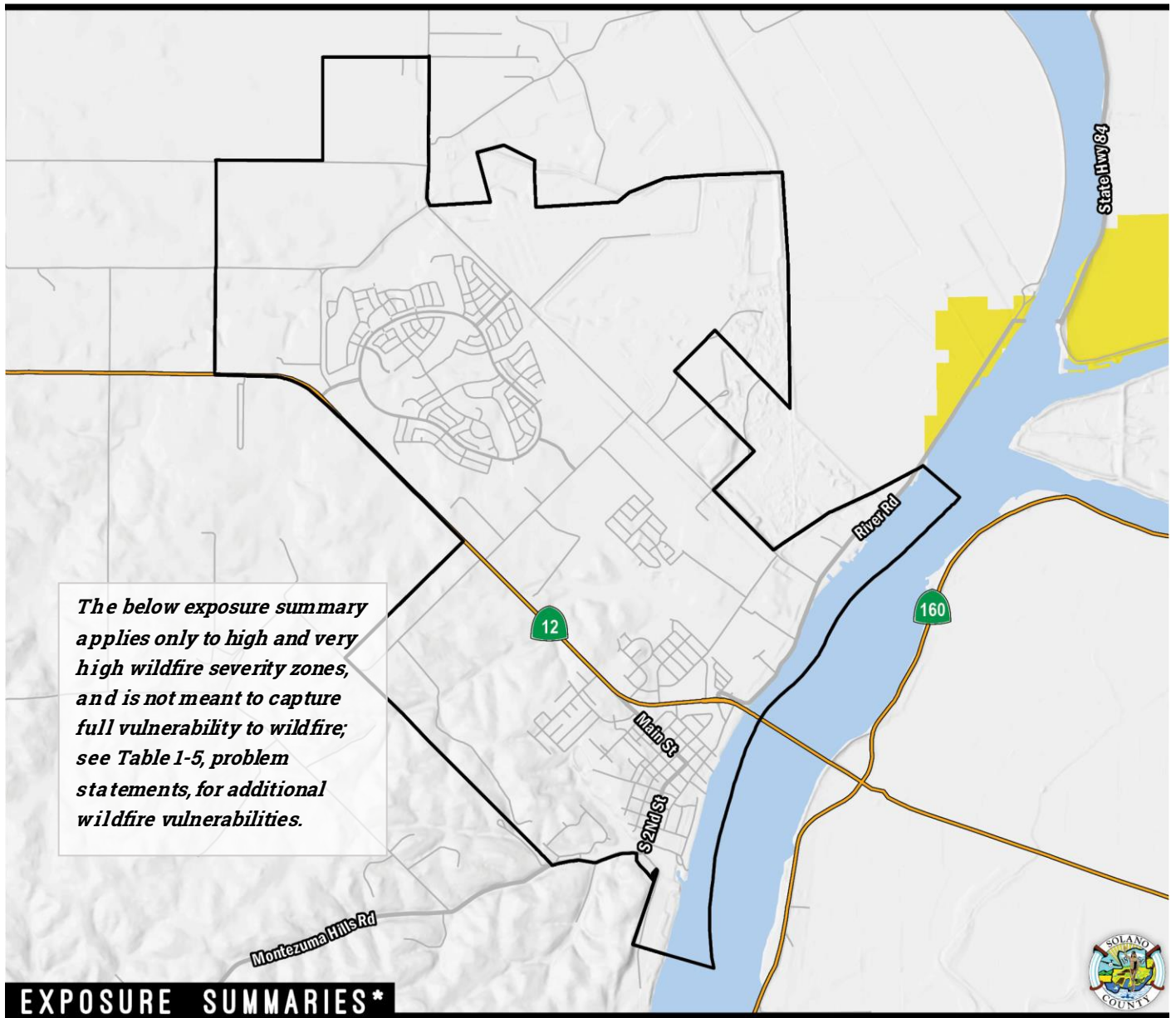


Figure 4-4: City of Rio Vista – Mean Fire Return Interval



WILDFIRE RISK EXPOSURE

RIO VISTA



EXPOSURE SUMMARIES*

POPULATION COUNT IN HAZARD AREA

Count	Exp. Rate**
0	0%
Count Includes: H VH	

PARCEL COUNT IN HAZARD AREA

Count	Exp. Rate**
0	0%
Count Includes: H VH	

PARCEL VALUE IN HAZARD AREA

Sum of Improvement Value	Exp. Rate**
\$0	0%
Sum of Content Value	0%
\$0	0%
Count Includes: H VH	

CRITICAL INFRASTRUCTURE COUNTS IN HAZARD AREA

Infrastructure Category	Count	Exp. Rate**	Count/Sum Includes:
Essential Facilities	0	0%	H VH
High Potential Loss	0	0%	
Transportation & Lifeline	0	0%	0 0%

Sum of Transportation & Lifeline Linear Mileage

MAP LEGEND



*Exposure summaries include high and very high risk areas. Hazard data source: Cal Fire, CPUC.

**Exposure Rate - Exposed summary or count as a percentage of total summary or count within jurisdiction.

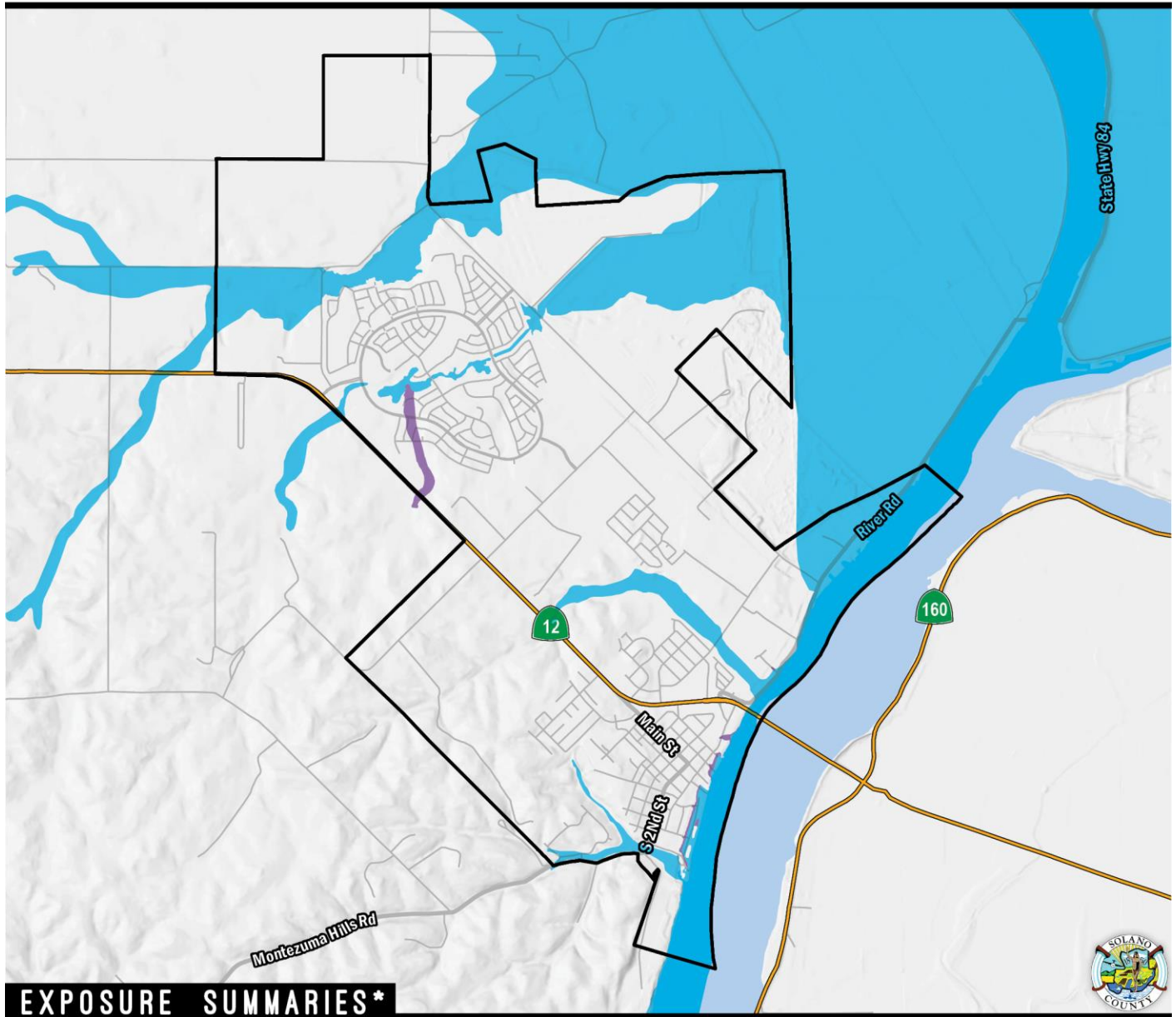
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Figure 4-5: City of Rio Vista – Wildfire Risk Exposure



FEMA FLOOD RISK EXPOSURE

RIO VISTA



EXPOSURE SUMMARIES*

POPULATION COUNT IN HAZARD AREA

Count	Exp. Rate**
747	9%
Count Includes:	100 + + 500

PARCEL COUNT IN HAZARD AREA

Count	Exp. Rate**
117	2%
Count Includes:	100 + + 500

PARCEL VALUE IN HAZARD AREA

Sum of Improvement Value	Exp. Rate**
\$56,279,197	3%
Sum of Content Value	Exp. Rate**
\$33,790,061	3%
Count Includes:	100 + + 500

CRITICAL INFRASTRUCTURE COUNTS IN HAZARD AREA

Infrastructure Category	Count	Exp. Rate**	Count/Sum Includes:
Essential Facilities	0	0%	100 + + 500
High Potential Loss	14	14%	Sum of Transportation & Lifeline Linear Mileage
Transportation & Lifeline	3	38%	9 10%

MAP LEGEND



*Exposure summaries include 100-year and 500-year flood zone areas, including coastal and leveed areas. Hazard data source: FEMA.

**Exposure Rate - Exposed summary or count as a percentage of total summary or count within jurisdiction.

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Figure 4-6: City of Rio Vista – FEMA Flood Risk Exposure



Table 4-4: City of Rio Vista - Damage Estimate Summaries, 100YR Flood

Building Type	Building Damage (\$)	Building Damage (% of total loss)	Content Damage (\$)	Content Damage (% of total loss)	Total Damage (\$)	Proportion of Loss (%)
Agriculture	\$0	0.0%	\$0	0.0%	\$0	0%
Commercial	\$11,925	0.2%	\$31,976	0.5%	\$43,901	1%
Education*	\$0	0.0%	\$0	0.0%	\$0	0%
Emergency	\$0	0.0%	\$0	0.0%	\$0	0%
Government	\$22,470	0.3%	\$49,380	0.7%	\$71,850	1%
Industrial	\$601,864	9.1%	\$2,128,733	32.3%	\$2,730,597	41%
Religion	\$0	0.0%	\$0	0.0%	\$0	0%
Residential	\$2,868,793	43.5%	\$883,922	13.4%	\$3,752,716	57%
Total	\$3,505,052	53%	\$3,094,011	47%	\$6,599,064	

*School district asset information not available during time of Hazus analysis.

Note: Total Inventory Values

1 - Building Replacement Costs = \$3,773,922,295

2 - Content Replacement Costs = \$2,667,166,517

3 - Total Value = \$6,441,088,812

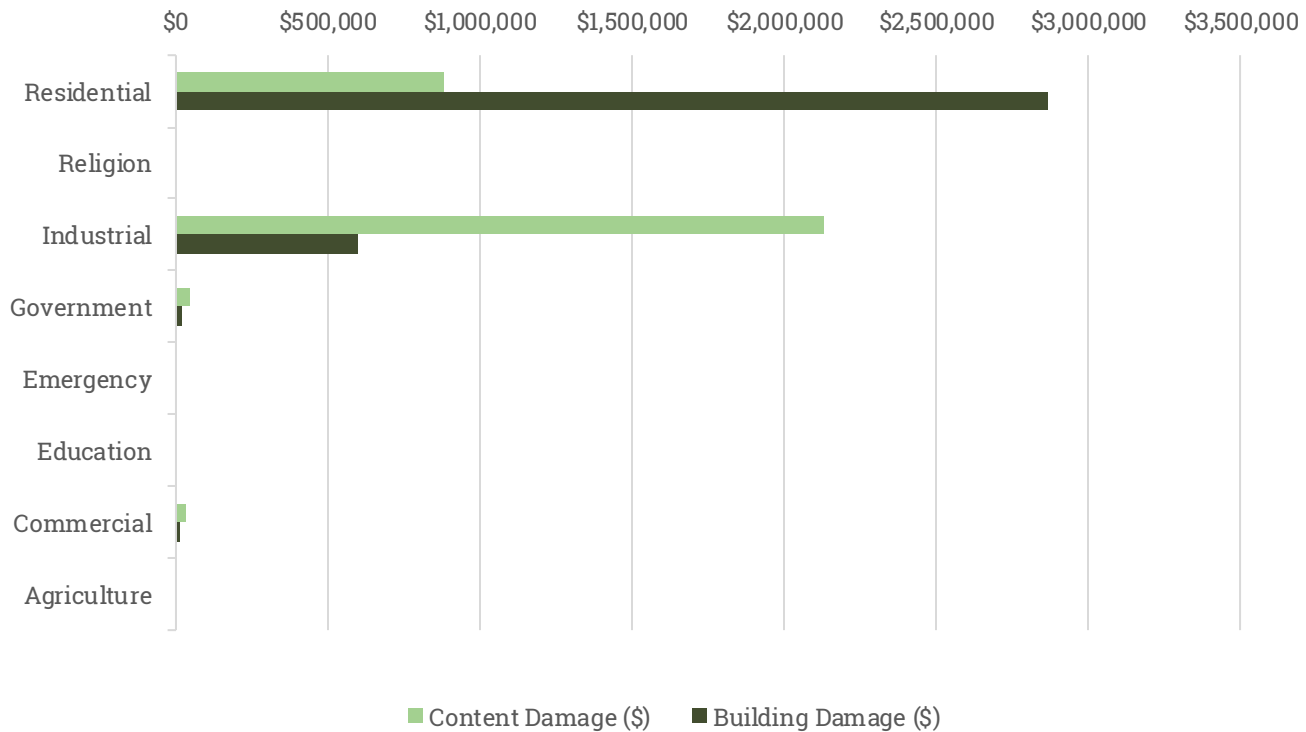




Table 4-5: City of Rio Vista - Damage Estimate Summaries, 500YR Flood

Building Type	Building Damage (\$)	Building Damage (% of total loss)	Content Damage (\$)	Content Damage (% of total loss)	Total Damage (\$)	Proportion of Loss (%)
Agriculture	\$0	0.0%	\$0	0.0%	\$0	0%
Commercial	\$0	0.0%	\$0	0.0%	\$0	0%
Education*	\$0	0.0%	\$0	0.0%	\$0	0%
Emergency	\$0	0.0%	\$0	0.0%	\$0	0%
Government	\$0	0.0%	\$0	0.0%	\$0	0%
Industrial	\$0	0.0%	\$0	0.0%	\$0	0%
Religion	\$0	0.0%	\$0	0.0%	\$0	0%
Residential	\$1,515,024	76.0%	\$477,173	24.0%	\$1,992,197	100%
Total	\$1,515,024	76%	\$477,173	24%	\$1,992,197	

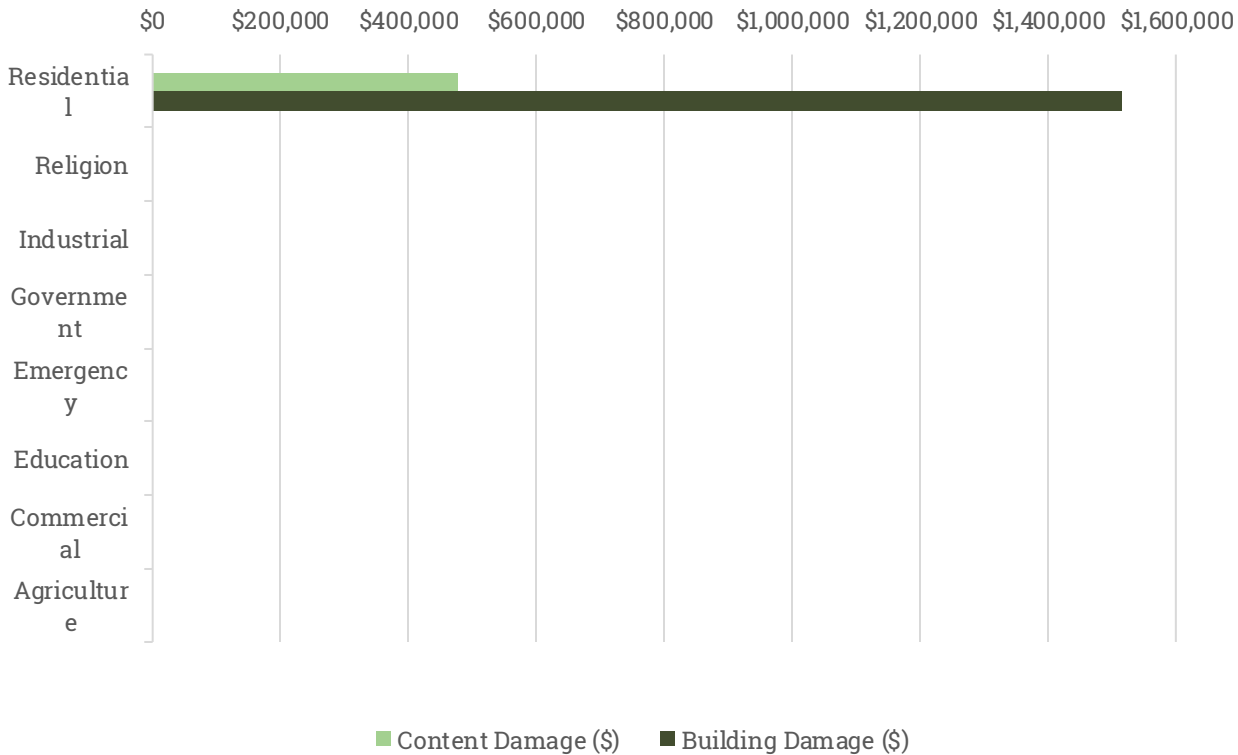
*School district asset information not available during time of Hazus analysis.

Note: Total Inventory Values

1 - Building Replacement Costs = \$3,773,922,295

2 - Content Replacement Costs = \$2,667,166,517

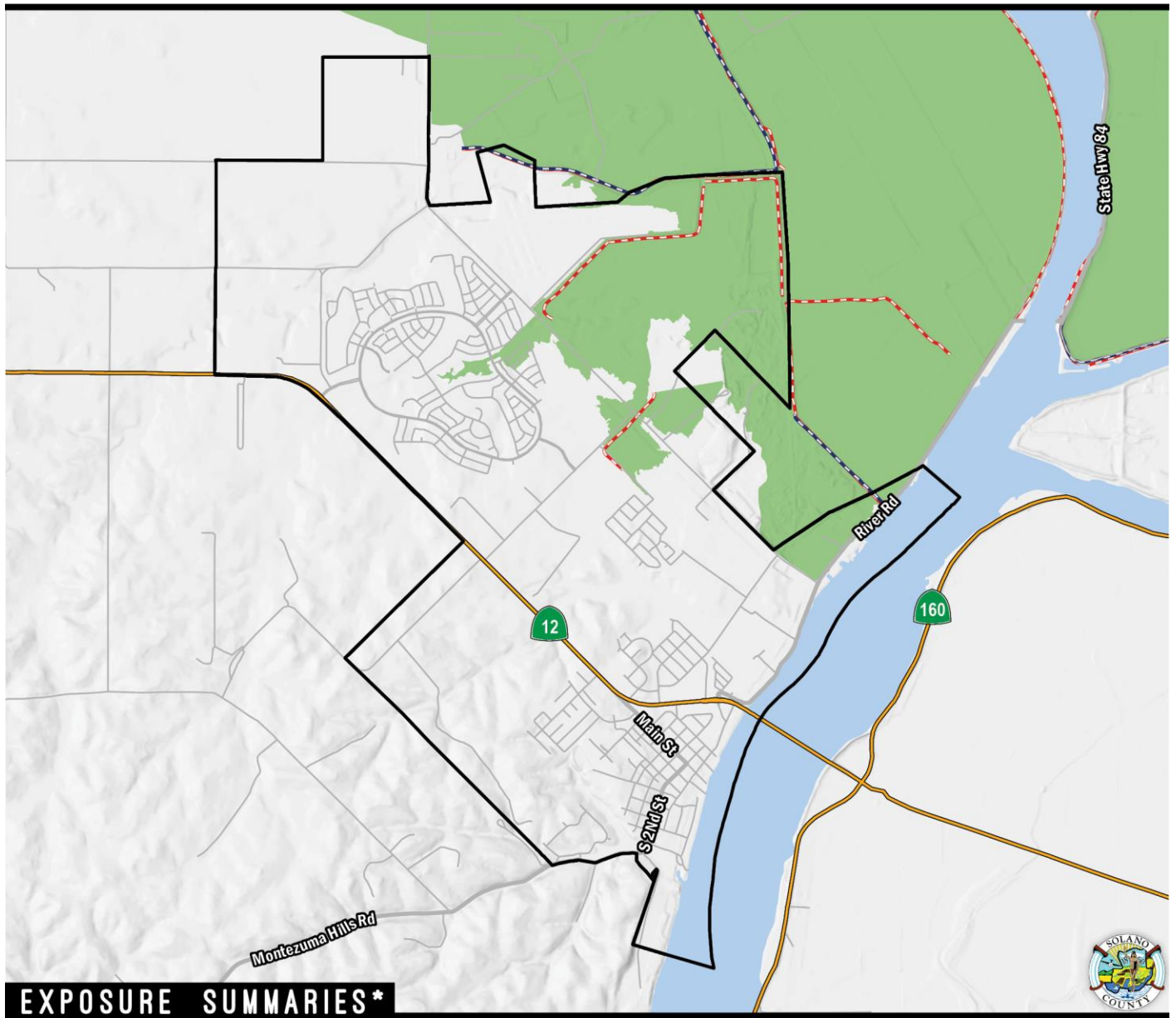
3 - Total Value = \$6,441,088,812





AREA PROTECTED BY LEVEE (NLD) EXPOSURE

RIO VISTA



EXPOSURE SUMMARIES*

POPULATION COUNT IN HAZARD AREA	
Count	Exp. Rate**
295	3%
Count Includes: APL	

PARCEL COUNT IN HAZARD AREA	
Count	Exp. Rate**
77	2%
Count Includes: APL	

PARCEL VALUE IN HAZARD AREA	
Sum of Improvement Value	Exp. Rate**
\$36,363,720	2%
Sum of Content Value	
\$22,258,323	2%
Count Includes: APL	

CRITICAL INFRASTRUCTURE COUNTS IN HAZARD AREA			
Infrastructure Category	Count	Exp. Rate**	Count/Sum Includes:
Essential Facilities	0	0%	APL
High Potential Loss	0	0%	
Transportation & Lifeline	1	13%	8 9%

Sum of Transportation & Lifeline Linear Mileage

MAP LEGEND

USACE AREA PROTECTED BY LEVEE (APL)

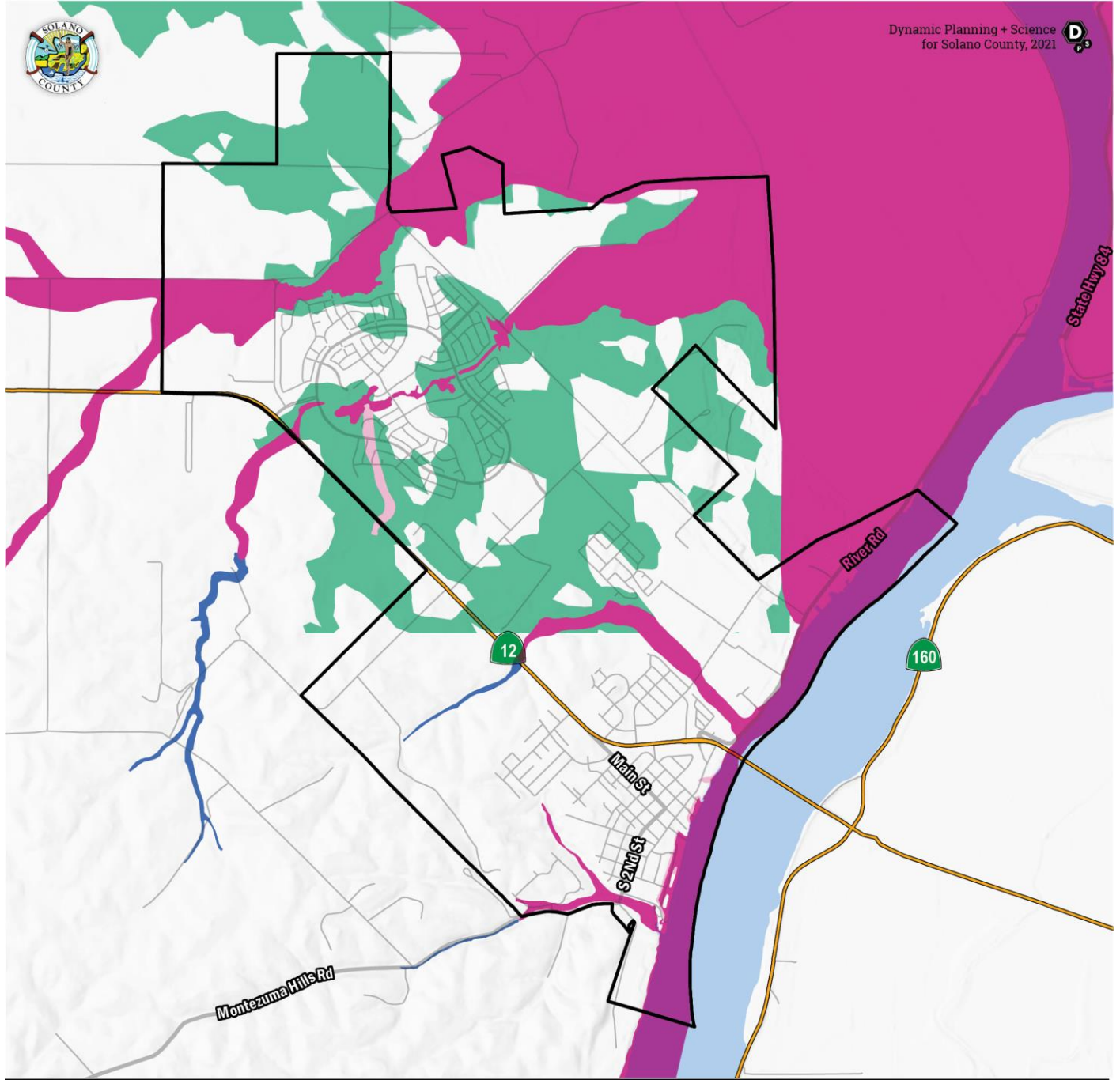
 PROJECT LEVEE
 OTHER KNOWN LEVEES

*Exposure summaries include all NLD areas protected by levee. Hazard data source: USACE.

**Exposure Rate - Exposed summary or count as a percentage of total summary or count within jurisdiction.

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Figure 4-7: City of Rio Vista - Area Protected by Levee (NLD) Exposure



BAM 200-YR FLOODING AND AWARENESS ZONES RIO VISTA

*Data sources: DWR.

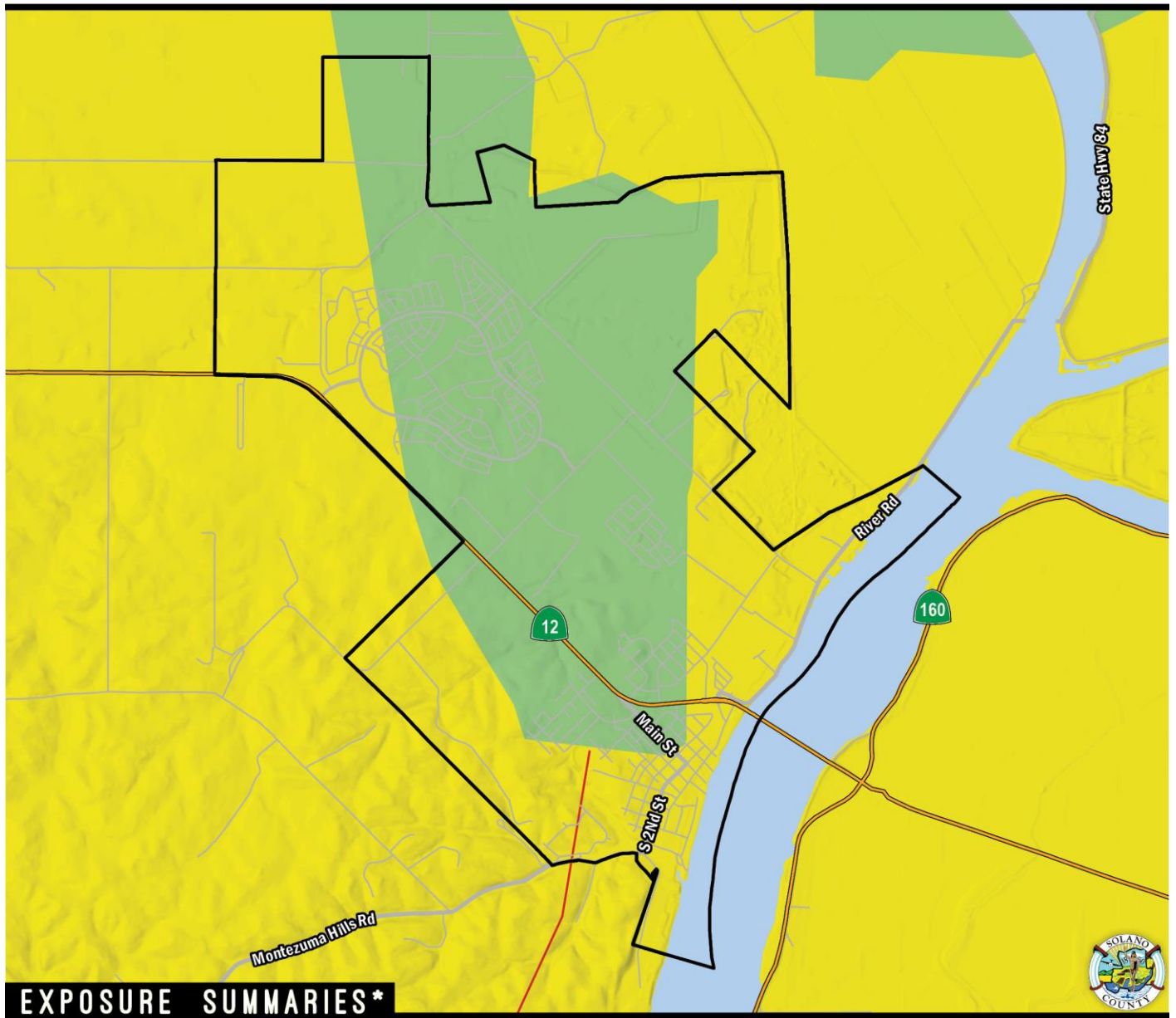
FEMA FLOOD ZONES		DWR AWARENESS ZONES
100-YR (SFHA)	500-YR	
USACE SAC. SAN JOAQUIN R. COMPREHENSIVE STUDY		
100-YR	200-YR	500-YR

Figure 4-8: City of Rio Vista – BAM 200-YR Flooding and Awareness Zones



CONCORD-GREEN VALLEY EARTHQUAKE SCENARIO (M6.8)

RIO VISTA



EXPOSURE SUMMARIES*

POPULATION COUNT IN HAZARD AREA	
Count	Exp. Rate**
4,336	50%
Count Includes: S+++E	

PARCEL COUNT IN HAZARD AREA	
Count	Exp. Rate**
1,101	23%
Count Includes: S+++E	

PARCEL VALUE IN HAZARD AREA	
Sum of Improvement Value	Exp. Rate**
\$553,609,442	26%
Sum of Content Value	
\$345,028,258	29%
Count Includes: S+++E	

CRITICAL INFRASTRUCTURE COUNTS IN HAZARD AREA			
Infrastructure Category	Count	Exp. Rate**	Count/Sum Includes:
Essential Facilities	1	33%	S+++E
High Potential Loss	62	62%	Sum of Transportation & Lifeline Linear Mileage
Transportation & Lifeline	3	38%	38 42%

MAP LEGEND

III	IV	V	VI	VII	VIII	IX	X
WEAK MMI	LIGHT	MODERATE	STRONG	VERY STRONG	SEVERE	VIOLENT	EXTREME

*Exposure summaries include strong, very strong, violent, and severe MMI classes. Hazard data source: USGS.
 **Exposure Rate - Exposed summary or count as a percentage of total summary or count within jurisdiction.
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Figure 4-9: City of Rio Vista– Concord Green Valley EQ Scenario (M6.8)



Table 4-6: City of Rio Vista - Concord Green Valley Damage Estimate Summaries

Building Type	Average of Potential Damage to Exceed "Slight"	Average of Potential Damage to Exceed "Moderate"	Average of Potential Damage to Exceed "Extensive"	Average Economic Loss for Each Building Category	Sum of Economic Loss	Proportion of Loss (%)
Agriculture	22%	9%	1%	\$1,813	\$3,626	0%
Commercial	11%	3%	0%	\$28,682	\$2,208,513	11%
Education*	0%	0%	0%	\$0	\$0	0%
Emergency	0%	0%	0%	\$0	\$0	0%
Government	11%	2%	0%	\$12,231	\$440,299	2%
Industrial	25%	10%	1%	\$142,926	\$4,001,935	19%
Religion	9%	1%	0%	\$14,846	\$193,004	1%
Residential	6%	0%	0%	\$3,026	\$14,066,490	67%
Total					\$20,913,866	

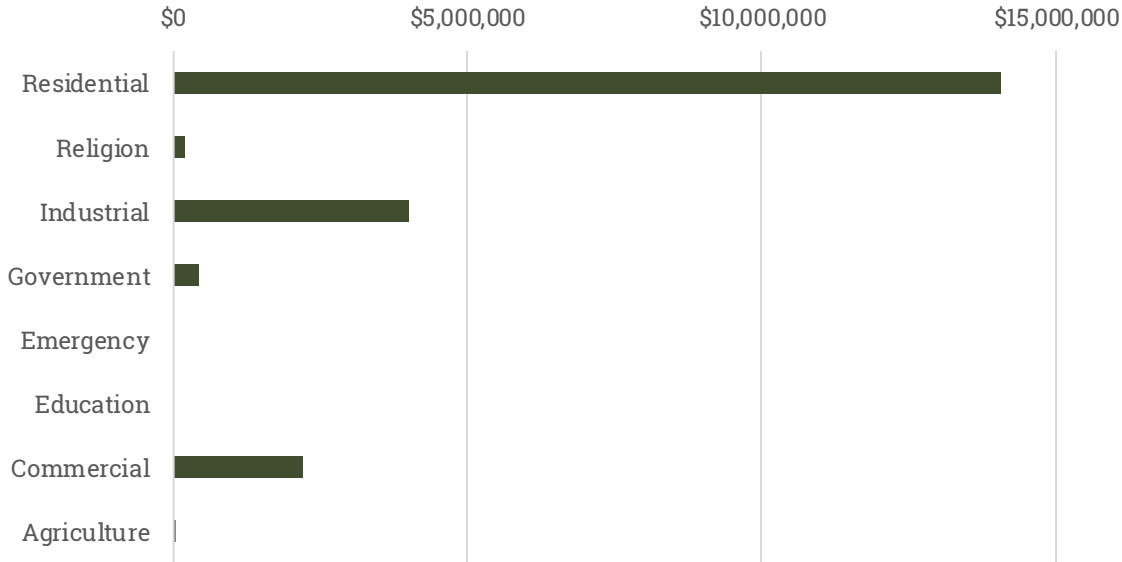
*School district asset information not available during time of Hazus analysis.

Note: Total Inventory Values

1 - Building Replacement Costs = \$3,773,922,295

2 - Content Replacement Costs = \$2,667,166,517

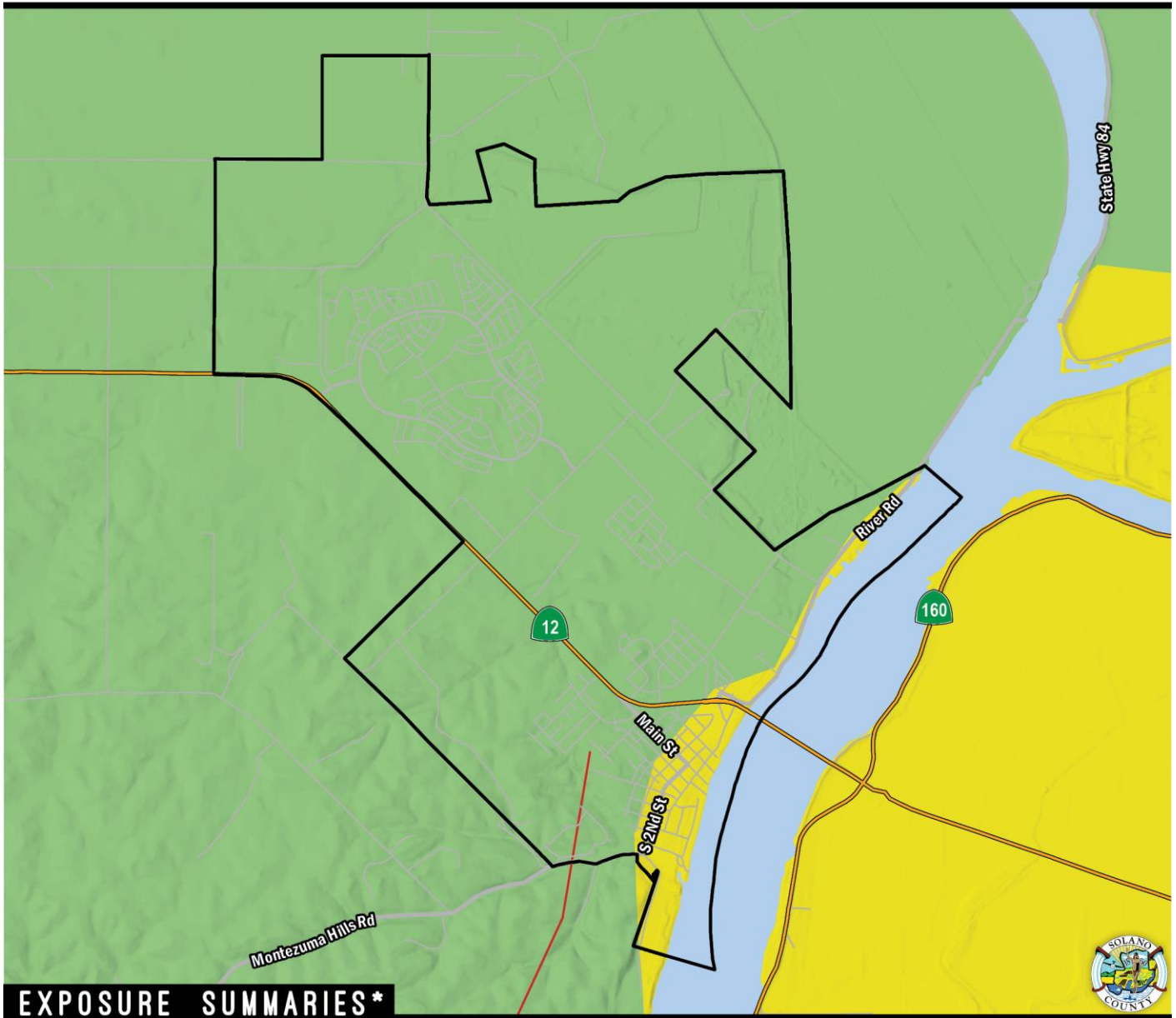
3 - Total Value = \$6,441,088,812





HAYWARD-RODGER'S CREEK EARTHQUAKE SCENARIO (M7.1)

RIO VISTA



EXPOSURE SUMMARIES*

POPULATION COUNT IN HAZARD AREA		PARCEL COUNT IN HAZARD AREA		PARCEL VALUE IN HAZARD AREA		CRITICAL INFRASTRUCTURE COUNTS IN HAZARD AREA			
Count	Exp. Rate**	Count	Exp. Rate**	Sum of Improvement Value	Exp. Rate**	Infrastructure Category	Count	Exp. Rate**	Count/Sum Includes:
2,235	26%	367	8%	\$198,710,142	9%	Essential Facilities	2	67%	S+++E
Count Includes: S+++E		Count Includes: S+++E		Sum of Content Value		High Potential Loss	42	42%	Sum of Transportation & Lifeline Linear Mileage
				\$134,968,958	11%	Transportation & Lifeline	1	13%	9 10%
				Count Includes: S+++E					

MAP LEGEND

III	IV	V	VI	VII	VIII	IX	X
WEAK MMI	LIGHT	MODERATE	STRONG	VERY STRONG	SEVERE	VIOLENT	EXTREME

*Exposure summaries include strong, very strong, violent, and severe MMI classes. Hazard data source: USGS.

**Exposure Rate - Exposed summary or count as a percentage of total summary or count within jurisdiction.

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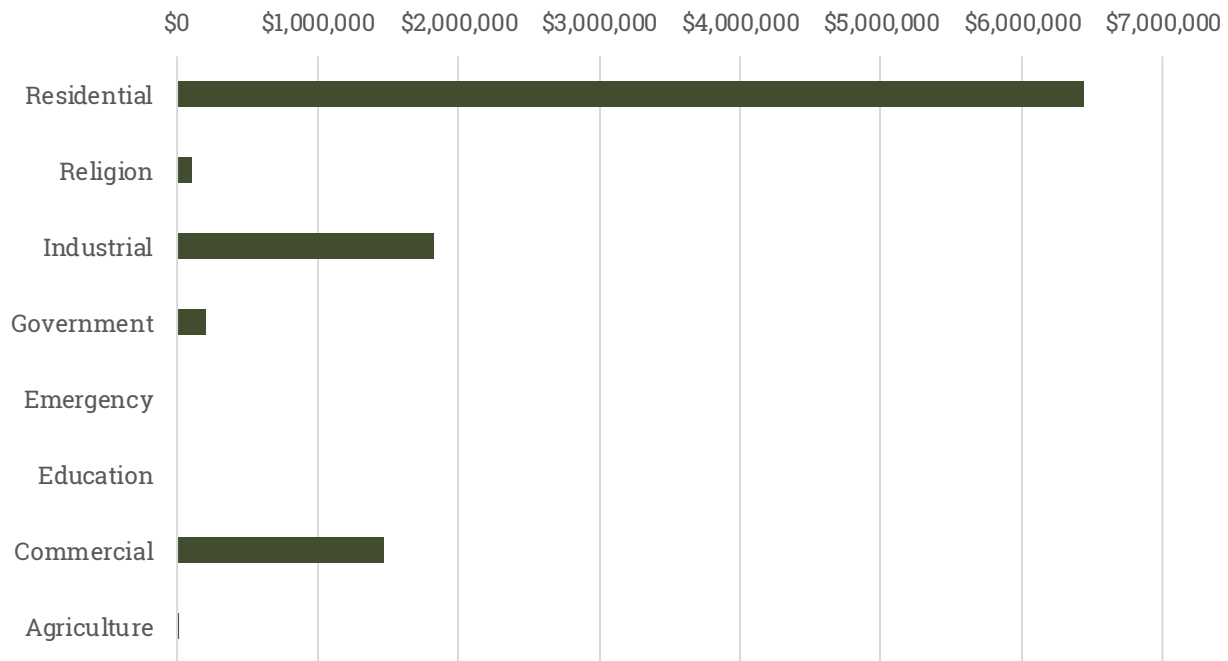
Figure 4-10: City of Rio Vista– Hayward Rodger's Creek EQ Scenario (M7.1)



Table 4-7: City of Rio Vista - Hayward Rodger's Creek Damage Estimation Summaries

Building Type	Average of Potential Damage to Exceed "Slight"	Average of Potential Damage to Exceed "Moderate"	Average of Potential Damage to Exceed "Extensive"	Average Economic Loss for Each Building Category	Sum of Economic Loss	Proportion of Loss (%)
Agriculture	10%	3%	0%	\$733	\$1,466	0%
Commercial	8%	2%	0%	\$19,033	\$1,465,569	15%
Education*	0%	0%	0%	\$0	\$0	0%
Emergency	0%	0%	0%	\$0	\$0	0%
Government	5%	1%	0%	\$5,653	\$203,513	2%
Industrial	14%	5%	1%	\$65,253	\$1,827,082	18%
Religion	7%	1%	0%	\$8,659	\$112,573	1%
Residential	3%	0%	0%	\$1,386	\$6,445,611	64%
Total					\$10,055,814	

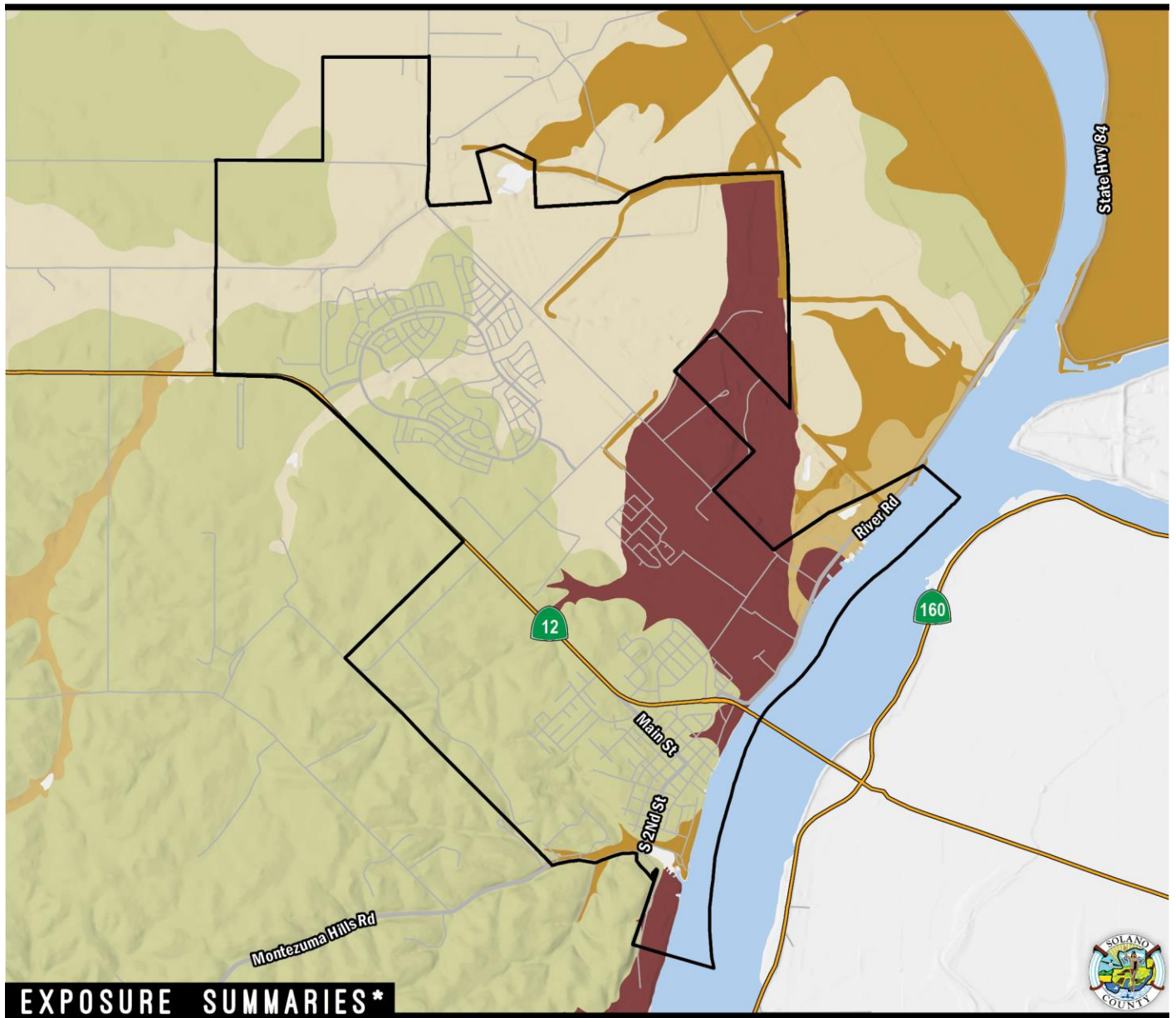
*School district asset information not available during time of Hazus analysis.
 Note: Total Inventory Values
 1 - Building Replacement Costs = \$3,773,922,295
 2 - Content Replacement Costs = \$2,667,166,517
 3 - Total Value = \$6,441,088,812





AREAS WITH POTENTIAL FOR LIQUEFACTION

RIO VISTA



EXPOSURE SUMMARIES*

POPULATION COUNT IN HAZARD AREA

Count	Exp. Rate**
3,348	39%
Count Includes: M H VH	

PARCEL COUNT IN HAZARD AREA

Count	Exp. Rate**
320	7%
Count Includes: M H VH	

PARCEL VALUE IN HAZARD AREA

Sum of Improvement Value	Exp. Rate**
\$167,294,585	8%
Sum of Content Value	Exp. Rate**
\$126,118,858	11%
Count Includes: M H VH	

CRITICAL INFRASTRUCTURE COUNTS IN HAZARD AREA

Infrastructure Category	Count	Exp. Rate**	Count/Sum Includes:
Essential Facilities	1	33%	M H VH
High Potential Loss	38	38%	Sum of Transportation & Lifeline Linear Mileage
Transportation & Lifeline	1	13%	16 18%

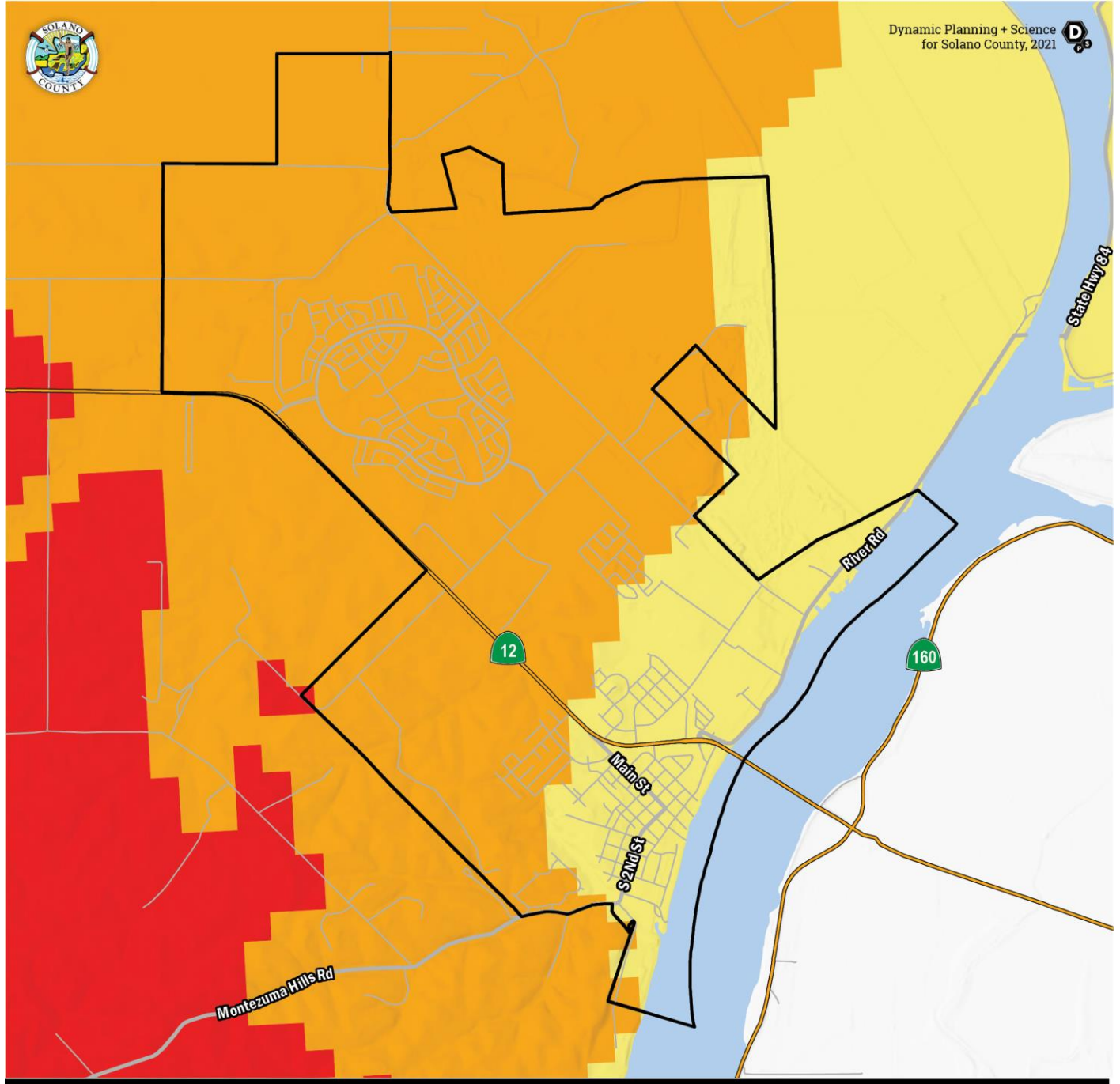


*Exposure summaries include medium, high, very high susceptibility. Hazard data source: USGS.

**Exposure Rate - Exposed summary or count as a percentage of total summary or count within jurisdiction.

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Figure 4-11: City of Rio Vista – Areas with Potential for Liquefaction



ANNUAL AVERAGE WIND SPEED (POWER CLASS) RIO VISTA

*Data sources: NREL.



Figure 4-12: City of Rio Vista – Annual Average Wind Speed (Power Class)



Table 4-8: Drought Classifications and Impacts

Category	Description	Possible Impacts
D0	Abnormally Dry	<ul style="list-style-type: none"> Active fire season begins Going into drought, short term dryness, slowing planting, growth of crops or pastures. Coming out of drought, some lingering water deficits and pasture or crops not fully recovered,
D1	Moderate Drought	<ul style="list-style-type: none"> Some damage to crops, pastures Streams, reservoirs, or wells low, some water shortages developing or imminent Voluntary water-use restrictions requested
D2	Severe Drought	<ul style="list-style-type: none"> Crop or pasture losses likely Water shortages common Water restrictions imposed
D3	Extreme Drought	<ul style="list-style-type: none"> Major crop/ pasture losses Widespread water shortages or restrictions
D4	Exceptional Drought	<ul style="list-style-type: none"> Exceptional and widespread crop/ pasture losses Shortages of water in reservoirs, streams, and wells creating water

Adapted from U.S. Drought Monitor Drought Classifications and Impacts

Drought Severity Timeline

Lower Sacramento

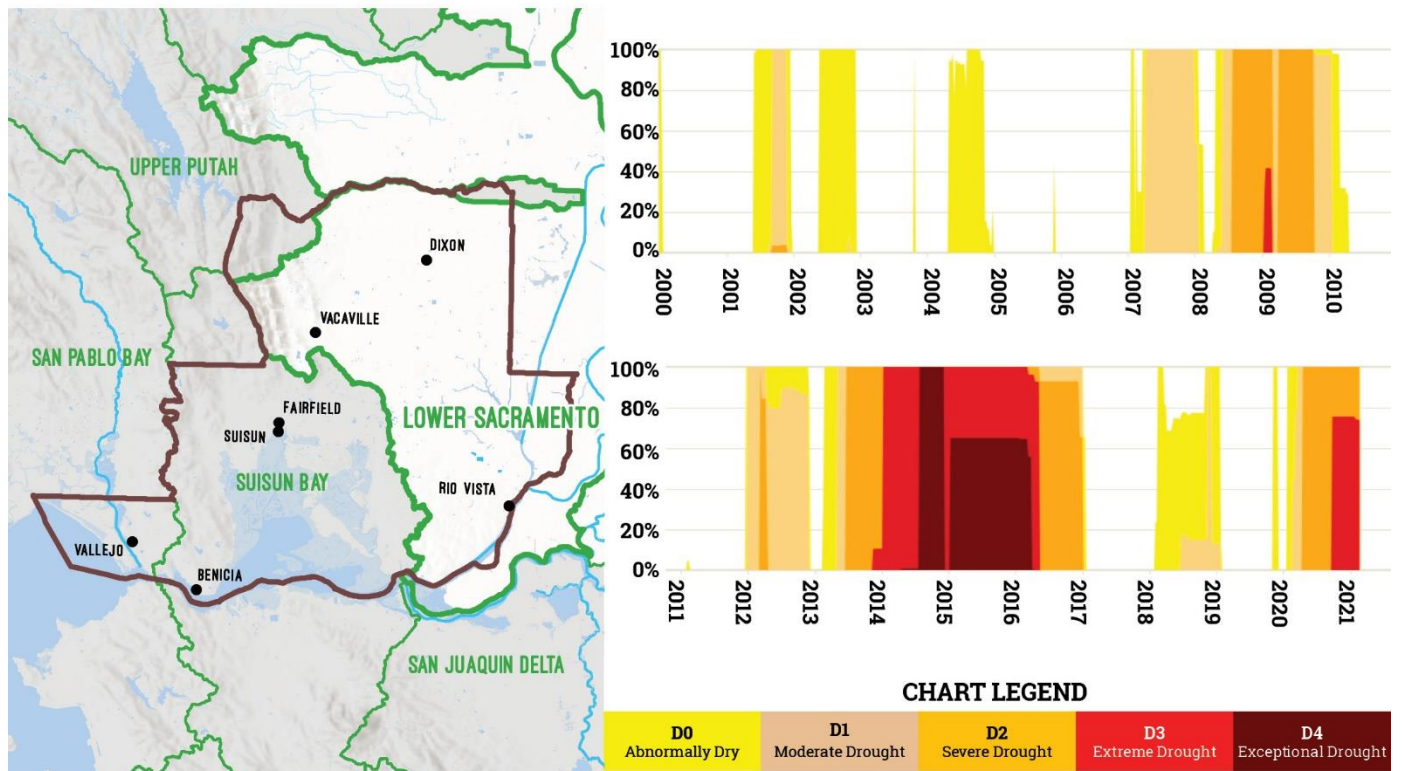


Figure 4-13: City of Rio Vista– Drought Severity Timeline – Lower Sacramento

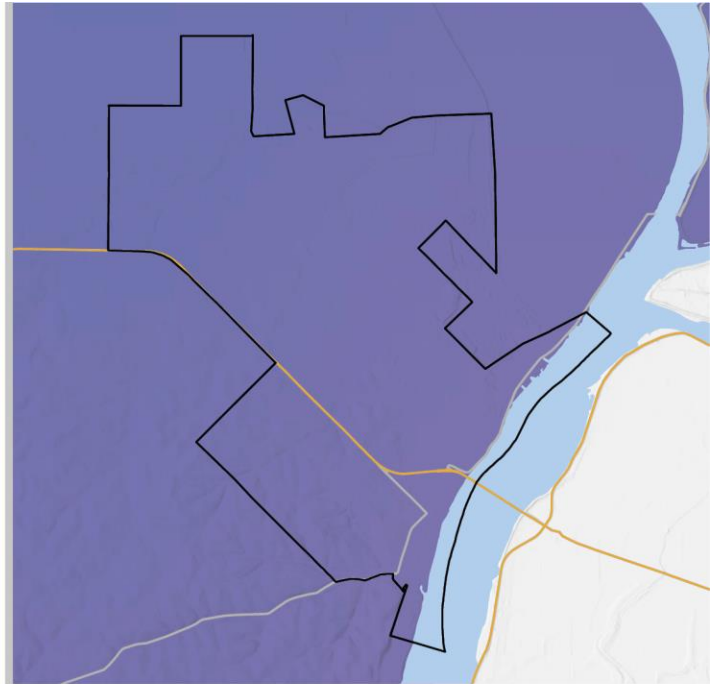


RIO VISTA AVERAGE ANNUAL MAXIMUM TEMPERATURE

COMPARISON OF CURRENT OBSERVED TO RCP 4.5 AND RCP 8.5 SCENARIOS



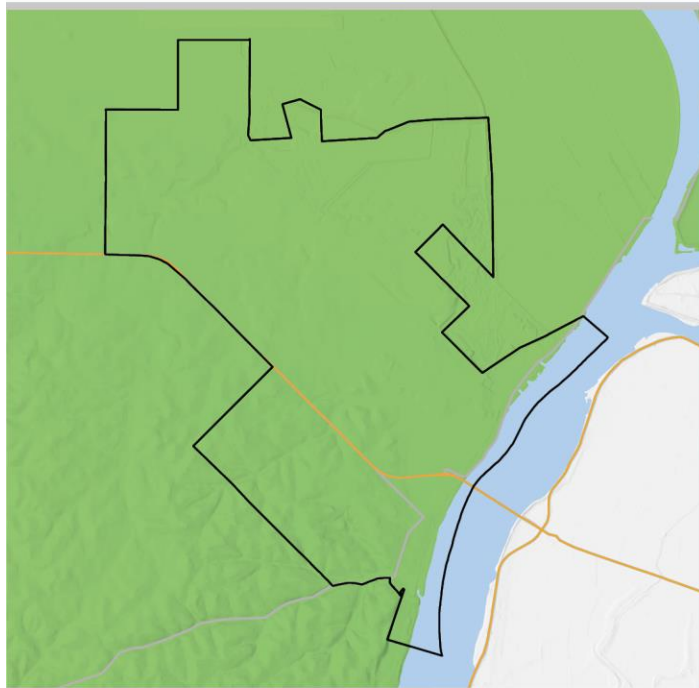
*Data sources: Cal-Adapt CanESM2 RCP 4.5 & 8.5, PRISM 30-YR Norms Annual Max Temp



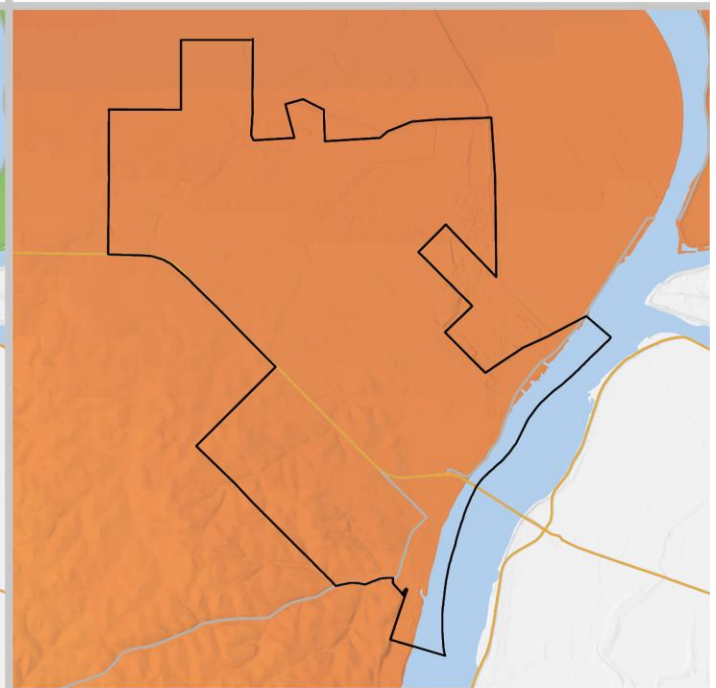
CURRENT 30-YR NORMAL



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RCP 4.5 YEAR 2100



RCP 8.5 YEAR 2100

Figure 4-14: City of Rio Vista – RCP Comparison



4.4.3.3 Past and Future Development

The City of Rio Vista is a general law city that crafts its own development regulations and is subject to State law. Future development is subject to compliance with state and local planning, zoning, subdivision, and architecture laws.

The City of Rio Vista's General Plan (GP) establishes long-range development policies. The GP is designed to help the City address issues related to land use, circulation (traffic), housing, open space, conservation, noise, and safety. The Land Use portion of the plan helps guide the City in determining the location of future development(s), including possible future annexation. In addition to the GP, the City has other plans that guide development in specific areas, including specific plans, policy plans, and master plans. These plans help to shape future development and dictate the City's Sphere of Influence (SOI). One of the central functions in these planning documents is to decrease risk of impact from natural hazards.

Development since Previous HMP

While growth has occurred in hazard areas in the past, increasing hazard risks to some degree, those risks are also decreased by development standards and plan requirements that serve to mitigate or avoid those risks. Development since the last HMP has not increased hazard vulnerability for the City of Rio Vista. Problematic development generally occurred many decades ago; therefore, this HMP Annex has not been revised to reflect any substantial changes in past development and instead focuses on avenues to better mitigate impacts from problematic past development in the 1970's and earlier.

Future Development

City of Rio Vista is required to update building codes to meet the minimum standards to those required in the California Building Code last updated in 2019. California Building Codes provide some of the safest construction standards in the world and are meant to reduce risk to occupants from high wind, seismic activity, landslides, flood, wildfire, and other natural hazards. In addition to California minimum development standards, all jurisdictions belong to the NFIP, and all development must meet minimum flood protection standards set forth by FEMA. See Section 4.3.5 of Volume 1 for more information about past and future development in Solano County.

As the General Plan is updated and incorporates information from this HMP, City of Rio Vista staff are continually improving hazard information through these hazard mitigation plan updates. With this 2020 update, improved online mapping about natural hazards available on RAMP will inform those responsible for future development to make better decisions where and how future development occurs.

City of Rio Vista reviewed its general plans under the capability assessments undertaken for this hazard mitigation plan. See Section 4.5.1. Deficiencies revealed by these reviews are identified as mitigation actions to decrease risks to move beyond past trends.



The City's municipal codes includes regulations to mitigate the impact of hazards on new and existing development, including:

- Drainage and stormwater retention requirements,
- Steep slope restrictions for new development,
- Waterbody buffer requirements,
- Floodplain management regulations,
- Zoning that prevents development in hazardous areas of the community such as floodplains, landslide areas, the wildland-urban interface (WUI), or other known hazard areas, and
- Building codes that include the most up-to-date California Fire Code, seismic standards, and many other provisions crafted to protect new construction from hazard events.

Even in the event that limited development did occur within a hazard area, the municipal code should ensure impacts from a hazard event are mitigated and losses are minimal. If development does occur in hazard areas, evacuation and emergency planning should take into consideration the anticipated local impacts of the hazard event, including potential interrupted services or the elimination of access.

The anticipated growth in the City will not cause significant change in vulnerability to the City for identified priority hazards.

National Flood Insurance Program (NFIP)

The NFIP makes federally backed flood insurance available to homeowners, renters, and business owners in participating communities. FEMA has prepared a detailed Flood Insurance Study (FIS) for Solano County and municipalities. The study presents water surface elevations for floods of various magnitudes, including the 1-percent annual chance flood and the 0.2-percent annual chance flood (the 500-YR flood). Base flood elevations and the boundaries of the 100- and 500-YR floodplains are shown on Flood Insurance Rate Maps (FIRMs), which are the principal tools for identifying the extent and location of the flood hazard. FIRMs are the most detailed and consistent data source available, and for many communities they represent the minimum area of oversight under their floodplain management program. See Section 4 of Volume 1 for general information on the NFIP.

The City of Rio Vista has participated in the NFIP since 1981. The City of Rio Vista is currently in good standing with the provisions of the NFIP. Compliance is monitored by FEMA regional staff and by the California Department of Water Resources under a contract with FEMA. Maintaining compliance under the NFIP is an important component of flood risk reduction. See Table 4-9 for more information on the City's policies and historic flood insurance claims.



Table 4-9: NFIP Status Table

NFIP and CRS Status & Information	
City of Rio Vista	
NFIP Status	05/19/81
CRS Class	-
Policies in Force	61
Policies in SFHA	15
Policies in non-SFHA	46
Total Claims Paid	\$829,890
Paid Losses	44
Repetitive Loss Properties	3
Severe Repetitive Loss Properties	-
Repetitive Loss Payment by NFIP on Building	\$352,554
Repetitive Loss Payment by NFIP on Contents	\$111,454

Source: FEMA CIS 2021, OpenFEMA Data, FIMA RUL Solano County

Note: Policies and claims provided directly from FEMA Region IX CIS Report (8/2021). Repetitive loss tabulations by jurisdiction derived via GIS-based intersect of data available at OpenFEMA Data (<https://www.fema.gov/about/openfema/data-sets>). Countywide data reported for entire county area including municipalities. The Privacy Act of 1974 (5 U.S.C. 522a) restricts the release of certain types of data to the public. Flood insurance policy and claims data are included in the list of restricted information. FEMA can only release such data to state and local governments, and only if the data are used for floodplain management, mitigation, or research purposes. Therefore, this plan does not identify the repetitive loss properties or include claims data for any individual property.

See Volume 1, Section 4.5 for more information on the NFIP

4.4.3.4 Identify Hazard Problem Statements

As part of the mitigation action identification process, the Planning Committee for each jurisdiction identified areas of concern (aka problem statements) for their respective facilities based on the risk assessment and vulnerability analysis, utilizing the RAMP mapping and static snapshot maps. Problem statements focused on the impact, victim, or threat that the hazard could create in the jurisdiction, as described in Figure 4-15. Identifying common issues and weaknesses through these problem statements assisted the Planning Committee in understanding the realm of resources needed for mitigation. Jurisdiction problem statements are listed in Table 4-10.

The goal is to have at least one mitigation action for every problem statement. Projects or actions have been developed to mitigate each problem identified. See Table 4-15 for a full list of mitigation actions and corresponding problem statements that they address. Each problem statement is coded with a problem number for cross-referencing between Table 4-10 and Table 4-15.

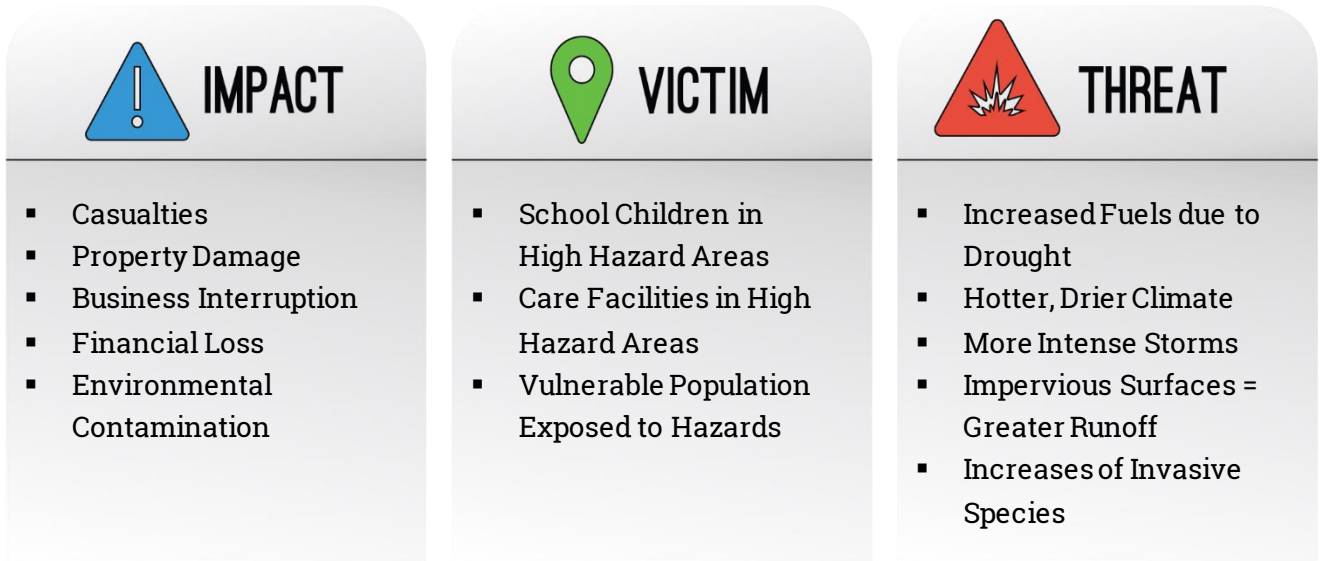


Figure 4-15: Guidance for Problem Statements

Table 4-10: Problem Statements

Problem No.	Hazard Type	Area of Concern	Mitigation Alternatives	Primary Agency	Problem Description	Related MA
ps-EW-RV-6	Extreme Weather	Threat	PPRO - Property Protection	City of Rio Vista	The City experiences high winds, which could exacerbate fires.	ma-EW-RV-108, ma-WF-RV-112
ps-WF-RV-7	Wildfire	Impact	PRV - Prevention, PPRO - Property Protection	City of Rio Vista	There is a threat of wildfire around the city due to standing grain, a prevalent fuel.	ma-WF-RV-112, ma-WF-RV-113
ps-DR-RV-8	Drought/Climate Change	Threat	PE&A - Public Education & Awareness, SP - Structural Projects	City of Rio Vista	The city depends on ground water for domestic water use, which could be impacted by drought. Droughts are likely to become more frequent and persistent with climate change.	ma-DR-BN-106
ps-FL-RV-9	Flood	Impact	PPRO - Property Protection, SP - Structural Projects	City of Rio Vista	Flooding from the Sacramento River is a particular concern, especially to the city hall area; the boat ramp just behind city hall is susceptible to floodwaters.	ma-FL-RV-109
ps-FL-RV-10	Flood	Impact	PPRO - Property Protection, SP - Structural Projects	City of Rio Vista	Edgewater Drive is a residential area with a high flood risk.	ma-FL-RV-110, ma-FL-RV-109
ps-FL-RV-11	Flood	Impact	SP - Structural Projects	City of Rio Vista	The city has some floodwalls, but its not certain whether they are certified or they would be sufficient in the event of a large flood.	ma-FL-RV-109



ps-FL-RV-12	Flood	Impact	SP - Structural Projects	City of Rio Vista	The storm water system is not holding up well and a heavy flood could compromise it.	ma-FL-RV-110
ps-EQ-RV-13	Earthquake	Impact	PPRO - Property Protection, PE&A - Public Education & Awareness, SP - Structural Projects	City of Rio Vista	The City has older buildings in the downtown area which have not been retrofitted and would be susceptible to damage from earthquake shaking.	ma-EQ-RV-107
ps-EQ-RV-14	Earthquake	Impact	PPRO - Property Protection, SP - Structural Projects	City of Rio Vista	Older infrastructure in the downtown area would be susceptible to earthquake damage.	ma-EQ-RV-107

4.4.4 Mitigation Action Support Tool (MAST)

As a living document, hazard problem statements and mitigation activities will be updated through a web interface application developed specifically for participating jurisdictions. The Mitigation Action Support Tool (MAST) is accessible through mitigatehazards.com/SolanoHMP/.

MAST is a web-based interactive tool that enables multiple users to search, view, enter, and update mitigation actions, ideas or projects, and other information. MAST provides participating jurisdictions and plan reviewers (Cal OES/FEMA) access to valuable mitigation information that can be leveraged by future planning or other risk reduction efforts within the County. Participating jurisdictions can update the status of their mitigation projects throughout the planning lifecycle, and this web-based tool will improve participating jurisdiction’s ability to apply for FEMA’s Hazard Mitigation Assistance (HMA) grant programs including initial grant application processes through Cal OES.



4.5 Mitigation Strategy

The mitigation strategy is the guidebook to future hazard mitigation administration, capturing the key outcomes of the MJHMP planning process. The mitigation strategy is intended to reduce vulnerabilities outlined in the previous section (a.k.a. problem statements) with a prescription of policies and physical projects. These mitigation actions should be compatible with existing planning mechanisms and should outline specific roles and resources for implementation success.

4.5.1 Capabilities & Adaptive Capacity Assessment

This section examines the planning and regulatory, administrative, technical, financial, educational, and outreach capabilities to augment known issues and weaknesses from identified natural hazards.

Capabilities assessments in this Volume 1 and in Volume 2 include considerations of a community's adaptive capacity for climate change, as outlined in Cal OES' 2020 California Adaptation Planning Guide. Adaptive capacity is a community or region's existing ability to moderate climate change impacts. Assessing adaptive capacity includes analysis of policies, plans, programs, funding, and staffing capacity.

The tables in this section explore various local planning mechanisms, administrative capacity, financial capabilities, and education and outreach initiatives. The columns in each table represent deeper dives into the following questions:

- Is the existing planning or regulatory mechanism used currently? (Column 1, Status)
- Has the HMP been integrated into the planning mechanism currently so that the named mechanism is currently used in HMP planning? (Column 2, Current Mitigation Use)
- Is there a future opportunity to expand, improve upon, and incorporate this 2020 HMP Update into the planning or regulatory mechanism? (Column 3, Future Opportunity)

The capabilities assessment is easily-digestible and based on color coding to indicate which policies and plans are adequate, need improvement or in which the HMP could be integrated. Each table includes a legend that explain how each one of these questions are being answered according to the color indicated: green, yellow, and orange.

For more information on the regulatory environment surrounding each hazard, see hazard-specific sections of Volume 1. Volume 1, Section 5.3.5 includes an extensive list of federal and state funding opportunities as well.



4.5.1.1 Planning and Regulatory Capabilities

Table 4-11: Planning and Regulatory Capabilities

CAPABILITY ASSESSMENT LEGEND		
Status	Current Mitigation Use	Future Opportunity
Currently in use or present.	Used widely for mitigation.	Opportunity to expand and integrate.
(Sort of) Seldomly used or limited presence.	Limited use in mitigation planning.	Limited opportunity to expand and integrate.
(No) Not present or available.	Not used in mitigation planning.	No opportunity to expand or integrate.

Resource	HMP Integration			Notes / Additional Detail
	Status	Current Mitigation Use	Future Opportunity	
Planning and Regulatory Capabilities				
Construction and Future Development Regulations				
Building Codes				2019 California Building Code
Building Code Effectiveness Grading Schedule (BCEGS) Rating	N/A	N/A	N/A	Unknown
Public Protection (ISO Class)				Class 4/4Y
Hazard Related Development Standards				Flood Hazards Protection, Standards of Construction (15.16.080); Floodways (15.16.120); Minimum Landscaping Requirements (17.27.080)
Hazard-Specific Ordinance				Geological Hazard Areas (17.44.050); Storm water Management Ordinance Title 13.20
Zoning Ordinance				FW- Floodway District
Growth Management Ordinance			N/A	
Hazard Reduction Programs (Annually Conducted)				
Capital Improvements Program (CIP) or Plan				
Erosion/Sediment Control Program				
Hazard-Related Public Outreach Program				See Education & Outreach Capabilities for more specifics.
Stormwater Management Program (Annual Inspections)				City of Rio Vista Sewer System Management Plan (includes storm water drainage maintenance)
Seismic Safety Program (Non-structural Inspections)				
Earthquake Modernization Program (Building Safety Inspections)				
Hazard Plans				
General Plan Safety Element				2001 General Plan



Resource	HMP Integration			Notes / Additional Detail
	Status	Current Mitigation Use	Future Opportunity	
Planning and Regulatory Capabilities				
Noteworthy Area/ Specific Plan with Hazard Focus	N/A	N/A	N/A	
Community Wildfire Protection Plan (CWPP)				
Wildfire Vulnerability Assessment				
Urban or Integrated Regional Water Management Plan				2015 Urban Water Management Plan
Floodplain Management Plan				2017 Central Valley Flood Protection Plan, proposed for updating 2022 Rio Vista Flood Control Feasibility Study (2020)
Stormwater Management Plan				UWMP
Ground Water Management Plan(s)				County GSP in development
Open Space and Land Management Plan(s)	N/A	N/A	N/A	
Emergency Operations Plan				2017 Solano County Emergency Operations Plan
Climate Action Plan, Vulnerability Ass'mt, or Adaptation Plan				2011 County of Solano Climate Action Plan; 2012 Rio Vista Climate Action Plan
Sustainable Community Plan (SB 375)				ABAG Plan Bay Area 2040 (2017)
Local Delta/ Wetlands Program(s)				Delta Plan; Under jurisdiction of Sac/San Joaquin Drainage District and Delta Commission
Downtown Plan with hazard focus				
Community Health Assessment(s)	N/A	N/A	N/A	Solan County Health Assessment
National Flood Protection Program (NFIP)				
Floodplain Management Regulations				
Flood Insurance Education and Technical Assist.				
Flood Hazard Mapping / Re-Mapping				2013 Flood Insurance Study
Community Rating System (CRS)				



4.5.1.2 Administrative and Technical Capabilities

Table 4-12: Administrative and Technical Capabilities

CAPABILITY ASSESSMENT LEGEND		
Status	Current Mitigation Use	Future Opportunity
Currently in use or present.	Used widely for mitigation.	Opportunity to expand and integrate.
(Sort of) Seldomly used or limited presence.	Limited use in mitigation planning.	Limited opportunity to expand and integrate.
(No) Not present or available.	Not used in mitigation planning.	No opportunity to expand or integrate.

Resource	HMP Integration			Notes / Additional Detail
	Status	Current Mitigation Use	Future Opportunity	
Administrative and Technical				
Community Planning and Development Services				
Community Planner				Planning Director (Vacant); General staffing challenges include adequate staffing and working with consultants with limited scopes of work.
Civil Engineer				Contracted position
Building Code Official				Building Inspector (Shawn Berrigan)
Floodplain Administrator				Robin Borre (Director of Public Works)
Fire Marshall				Fire Chief (vacancy)
Dedicated Public Outreach Personnel				
GIS Specialist and Capability				Contract assistance
Emergency Manager				Fire Chief (vacancy)
Grant Manager, Writer, or Specialist				Contract assistance as needed
Other				
Warning Systems/Services				
General			N/A	AlertSolano
Flood			N/A	Emergency Alert: AlertSolano Flood Risk: California Department of Water Resources Flood Risk Notification Program Flood Control: Solano County Water Agency
Wildfire			N/A	AlertSolano
Geological Hazards			N/A	AlertSolano; ShakeAlert.org (nation-wide)



4.5.1.3 Financial Capabilities

Table 4-13: Financial Capabilities

CAPABILITY ASSESSMENT LEGEND		
Status	Current Mitigation Use	Future Opportunity
Currently in use or present.	Used widely for mitigation.	Opportunity to expand and integrate.
(Sort of) Seldomly used or limited presence.	Limited use in mitigation planning.	Limited opportunity to expand and integrate.
(No) Not present or available.	Not used in mitigation planning.	No opportunity to expand or integrate.

Resource	HMP Integration			Notes / Additional Detail
	Status	Current Mitigation Use	Future Opportunity	
Fiscal Capabilities				
Financial Resources for Hazard Mitigation				
Levy for Specific Purposes with Voter Approval				While the City has employed these various financial capabilities to varying degrees, there are no examples of employing them for hazard mitigation projects or planning. However, it's not anticipated that many of these would be used to fund hazard mitigation projects in the future, either, unless paired with other grant funding.
Utilities Fees				
Benefit assessments				
System Development Fee				
Various Bonds to Incur Debt				
Withheld Spending in Hazard-Prone Areas	N/A	N/A	N/A	
Stormwater Service Fees				
Capital Improvement Project Funding				



4.5.1.4 Education and Outreach

Table 4-14: Education and Outreach Capabilities

CAPABILITY ASSESSMENT LEGEND		
Status	Current Mitigation Use	Future Opportunity
Currently in use or present.	Used widely for mitigation.	Opportunity to expand and integrate.
(Sort of) Seldomly used or limited presence.	Limited use in mitigation planning.	Limited opportunity to expand and integrate.
(No) Not present or available.	Not used in mitigation planning.	No opportunity to expand or integrate.

Resource	HMP Integration			Notes / Additional Detail
	Status	Current Mitigation Use	Future Opportunity	
Education / Outreach Capabilities				
Education/Outreach Resources				
Website Dedicated to Hazard Topics				Emergency Preparedness page on City website.
Dedicated Social Media				
Hazard Info. Avail. at Library/ Planning Desk				
Annual Public Safety Events				
Ability to Field Public Tech. Assistance Requests				
Public Safety Newsletters or Printed Outreach				
Fire Safe Councils	N/A	N/A	N/A	
Resource Conservation Districts				Solano Resource Conservation District
Other				

4.5.1.5 Capability and Adaptive Capacity Opportunities

The City of Rio Vista identified many opportunities for strengthening community capabilities and adaptive capacity. The City considered this assessment in developing its Mitigation Strategy.

The City is updating its General Plan, which will set the foundation for additional hazard mitigation capacity in the future. The City identified opportunities to revisit code language that could be strengthened for hazard protection and additional outreach and planning opportunities related to wildfire in particular.

Volume 1, Section 5.3.5 includes an extensive list of federal and state funding opportunities to leverage to improve community capabilities.



4.5.2 Mitigation Actions

Mitigation actions were developed based upon the jurisdiction’s priorities, risk assessment results, and mitigation alternatives. The mitigation action prioritization method used by all participating jurisdictions is described in Section 5.5.1 of Volume 1. Table 4-15 lists each priority mitigation action, responsible party, time frame, potential funding source, implementation steps, and resources need to implement based upon the Planning Committee consensus.

Each participating jurisdiction, including the City of Rio Vista, considered ongoing relevancy of mitigation actions from the existing MJHMP and retained or removed such actions while adding new relevant actions as well. Mitigation actions were examined for relevancy and the potential for future implementation and then evaluated for potential follow-up. Some mitigation actions developed during the previous HMP effort were not included because they were an inherent part of the HMP update process or were not detailed enough for implementation at a local Jurisdiction level. the City of Rio Vista has made significant changes to other mitigation actions because of the updated risk assessment and implementation strategy, to include more detail, or to update based on current mitigation practices. Volume 1, Section 5.5.2 provides a record of County wide mitigation actions, the status, and additional notes for each action.

Table 4-15 lists each mitigation action for the City of Rio Vista. Each participating jurisdiction developed unique mitigation actions, targeted at their own unique priorities and vulnerabilities. Each mitigation action identifies the responsible party, time frame, potential funding source, implementation steps and resources needed to implement these priority mitigation actions. As a living document, hazard problem statements and mitigation activities will be updated through MAST. The detail in Table 4-15 meets the regulatory requirements of FEMA and DMA 2000.

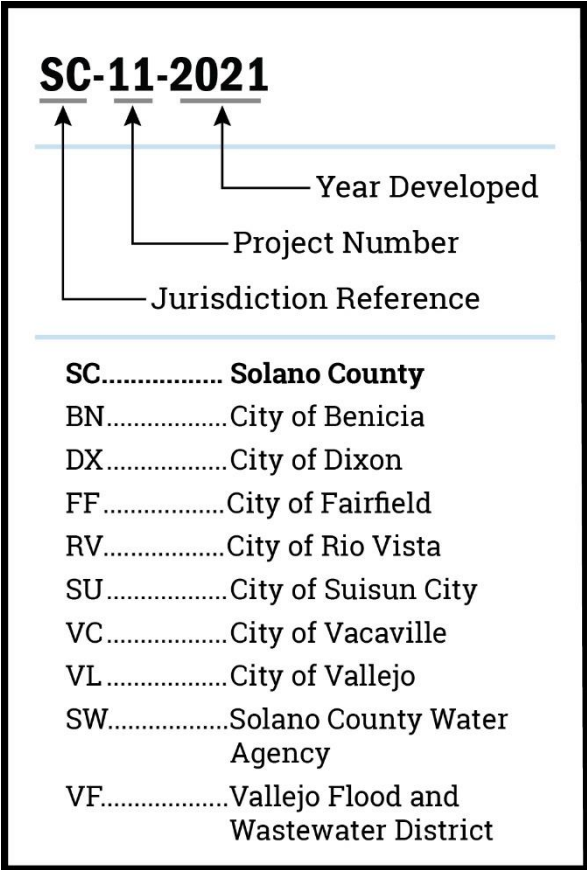


Figure 4-16: Mitigation Action Key

Table 4-15: City of Rio Vista Mitigation Actions

Mitigation No.	Hazard Type	Mitigation Type	Status	Year	Primary Agency	Title/Description	Responsible Party	Estimated Cost	Estimated Benefit	Time Frame	HMA Activity Type	Potential Grant Source	Priority	Related Goal(s)	Related Problem Statements
ma-WF-RV-112	All Hazard	PRV - Prevention	Pending	2021	City of Rio Vista	Implement a defensible space assessment, including for key wind corridors or areas more susceptible to wildfire carried by extreme wind.	City of Rio Vista	Medium - The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.	High - Project will provide an immediate reduction of risk exposure for life and property.	Annually	Planning	HMGP / BRIC	High	Goal 4: Resilience	ps-WF-RV-7, ps-EW-RV-6
ma-DR-BN-106	Drought/Climate Change	PRV - Prevention	Pending	2021	City of Rio Vista	Replace irrigated landscaping with drought resistant vegetation and increase use of recycled water for irrigation in preparation for drought impacts associated with climate change.	City of Rio Vista	Medium - The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.	High - Project will provide an immediate reduction of risk exposure for life and property.	1-3 Years	Project	HMGP / BRIC	High	Goal 2: Infrastructure, Goal 3: Environment, Goal 4: Resilience	ps-DR-RV-8
ma-EQ-RV-107	Earthquake	SP - Structural Projects	Pending	2021	City of Rio Vista	Develop an unreinforced masonry grant program to correct problems, such as bracing chimneys, on residential and nonresidential buildings.	City of Rio Vista	High - Existing funding will not cover the cost of the project; implementation would require new revenue through an alternative source (for example, bonds, grants, and fee increases).	High - Project will provide an immediate reduction of risk exposure for life and property.	1-3 Years	Project	HMGP / BRIC	High	Goal 1: People, Goal 4: Resilience	ps-EQ-RV-13, ps-EQ-RV-14
ma-FL-RV-109	Flood	PRV - Prevention	Pending	2021	City of Rio Vista	Raise structures to an elevation that provides protection against 200-year flood events (S-4 Implementation Alternative from Rio Vista Flood Control Feasibility Study) or implement other alternatives from the Study as may be prioritized in the future.	Public Works, in partnership with SCWA	High - Existing funding will not cover the cost of the project; implementation would require new revenue through an alternative source (for example, bonds, grants, and fee increases).	High - Project will provide an immediate reduction of risk exposure for life and property.	5-10 Years	Project	HMGP / BRIC	High	Goal 1: People, Goal 2: Infrastructure, Goal 4: Resilience	ps-FL-RV-9, ps-FL-RV-10, ps-FL-RV-11



Mitigation No.	Hazard Type	Mitigation Type	Status	Year	Primary Agency	Title/Description	Responsible Party	Estimated Cost	Estimated Benefit	Time Frame	HMA Activity Type	Potential Grant Source	Priority	Related Goal(s)	Related Problem Statements
ma-FL-RV-110	Flood	PRV - Prevention	Pending	2021	City of Rio Vista	Routinely inspect storm water channels for vegetation build up or encroachment, trash and debris, silt and gravel build up, and erosion or bank failure	City of Rio Vista	Medium - The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.	High - Project will provide an immediate reduction of risk exposure for life and property.	Annually	Planning	HMGP / BRIC	Medium	Goal 2: Infrastructure, Goal 4: Resilience	ps-FL-RV-10, ps-FL-RV-12
ma-WF-RV-113	Wildfire	PE&A - Public Education & Awareness	Pending	2021	City of Rio Vista	Conduct Public Education Campaign to increase awareness of threats of wildfire due to recreational use	City of Rio Vista	Medium - The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.	High - Project will provide an immediate reduction of risk exposure for life and property.	Annually	5%	HMGP / BRIC	High	Goal 4: Resilience	ps-WF-RV-7

SECTION 5

JURISDICTIONAL ANNEX:

City of Suisun City



SOLANO COUNTY

MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

[BACK TO ANNEX TABLE OF CONTENTS](#)

FINAL for adoption



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Solano County

Multi-Jurisdiction Hazard Mitigation Plan

CITY OF SUISUN CITY (SU.)

Municipal Annex

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Adoption Resolution

To comply with DMA 2000, the City of Suisun City has officially adopted this Solano County Multi-Jurisdictional Hazard Mitigation Plan (MJHMP), Volume 1, and its jurisdictional annex. The adoption of the MJHMP recognizes the City’s commitment to reducing the impacts of natural hazards. See included adoption resolution.

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RESOLUTION NO. 2022 -31

**A RESOLUTION OF THE CITY COUNCIL OF SUISUN CITY
ADOPTING THE UPDATED MULTI-JURISDICTION HAZARD
MITIGATION PLAN**

WHEREAS, the City of Suisun City, a political subdivision of the State of California, is an official participating jurisdiction in the updated Solano Multi-Jurisdiction Hazard Mitigation Plan (“MJHMP”); and

WHEREAS, the City of Suisun City recognizes the updated MJHMP as the official hazard mitigation plan for participating jurisdictions; and

WHEREAS, the City of Suisun City has gathered information and prepared the updated MJHMP in accordance with Federal Emergency Management Agency (FEMA) requirements at 44 CFR § 201.6; and

WHEREAS, Volume 1 of the updated MJHMP recognizes the threat that natural hazards pose to people and property Solano County-wide; and

WHEREAS, the City of Suisun City’s Annex to Volume 1 of the updated MJHMP provides additional information specific to the Suisun City, with a focus on providing additional details on the planning process, risk assessment, and mitigation strategy for this community; and

WHEREAS, the City of Suisun City has reviewed Volume 1 of the updated MJHMP and its Annex and affirms that the plan actions in Volume 1 and its Annex should reduce the potential for harm to people and property from future hazard occurrences within the community; and

WHEREAS, the U. S. Congress passed the Disaster Mitigation Act of 2000 (“Disaster Mitigation Act”) emphasizing the need for pre-disaster mitigation of potential hazards; and

WHEREAS, the Disaster Mitigation Act made available mitigation grants to state and local governments; and

WHEREAS, an adopted hazard mitigation plan is required as a condition of future funding for mitigation projects under multiple FEMA pre- and post-disaster mitigation grant programs; and

WHEREAS, the City of Suisun City fully participated in the FEMA-prescribed mitigation planning process to prepare this updated MJHMP; and

WHEREAS, the residents were afforded opportunities to comment and provide input in the updated MJHMP and the mitigation actions in the Plan; and

WHEREAS, The City of Suisun City, as a fully participating jurisdiction of the updated MJHMP, is an eligible sub-applicant to the State of California under FEMA’s hazard mitigation grant program guidance; and



Section 5. City of Suisun City

5.1 Purpose

This Annex details the hazard mitigation planning elements specific to the City of Suisun City. This Annex is not intended to be a standalone document but appends to and supplements the information contained in the umbrella plan document. As such, all sections of the umbrella plan, including the planning process and other procedural requirements apply to and were met by the City of Suisun City. This Annex provides additional information specific to the City of Suisun City, with a focus on providing additional details on the planning process, risk assessment, and mitigation strategy for this community.

Hazard Mitigation Plan Points of Contact

Primary Point of Contact

Aaron Roth, Chief of Police
Suisun City Police Department
701 Civic Center Blvd.
Suisun City, CA 94585
Telephone: (707)421-7383
e-mail: aroth@suisun.com

Alternate Point of Contact

Greg Folsom
City of Suisun
701 Civic Center Blvd.
Suisun City, CA 94585
(707)421-7300
gfolsom@suisun.com

5.2 Planning Methodology

The City of Suisun City followed the planning process detailed in Volume 1, Section 3, including participating in the County Hazard Mitigation Planning Committee (HMPC) and Steering Committee and formulating their own internal planning team to support the broader planning process. Internal planning participants, their positions, and how they participated in the planning process are shown in Table 5-1.

Table 5-1: Planning Committee Members

Planning Committee Members	Department
Aaron Roth	Chief of Police
Alma Hernandez	Council Member
April Conner	Building Technician
Greg Folsom	City Manager
Justin Vincent	Fire Chief
John Kearns	Senior Planner
Lakhwinder Deol	Finance Director
Matt Medill	Public Works Director & City Engineer
Nick Lozano	Associate Engineer
Harvey Higgs	Contract Building Official

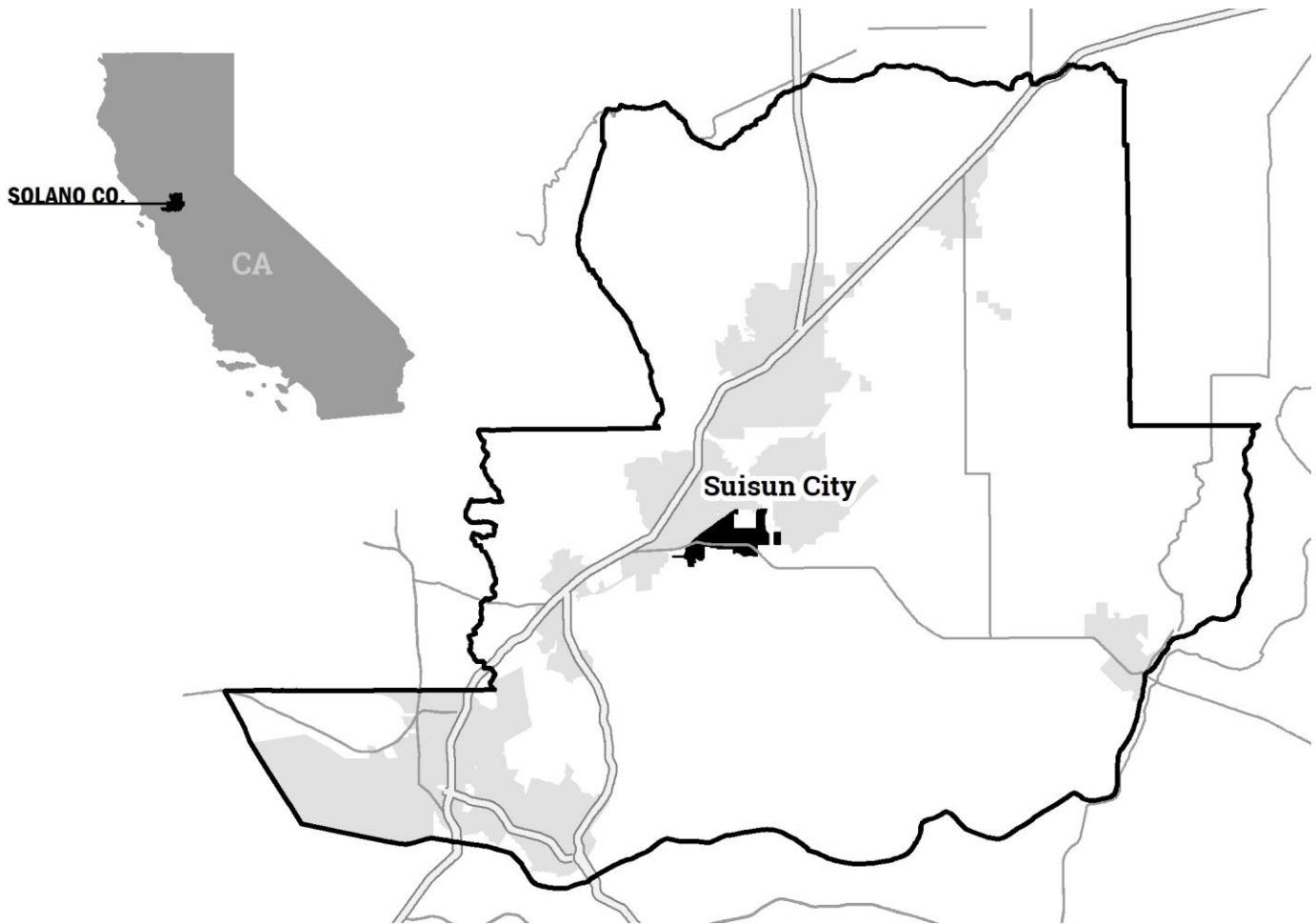


Figure 5-1: Suisun City

5.3 What's New

The City of Suisun City has been making improvements toward reducing natural hazard risks to life and property since the existing MJHMP was adopted.

The City reevaluated previous mitigation actions. The City determined to cancel some due to reprioritization, lack of funding, or other listed reasons. Currently there are no previous mitigation actions designated completed. Table 5-2 lists those cancelled mitigation actions along with an explanation for why. Other mitigation actions are pending or ongoing and are included in Table 5-15.

Success Story: New Suisun City Flood Resiliency Plan 2022. The City, along with Sustainable Solano, San Francisco Bay Conservation and Development Commission (BCDC), and stakeholders are developing the Suisun City Flood Resiliency Plan. The plan will consist of three major components: a guide to impacts of flooding and rising sea levels; a technical roadmap to inform stakeholders, government, and residents of emergency preparedness; and an extensive community informed process with educational outreach.



Table 5-2: Cancelled Mitigation Actions

Mitigation No.	Hazard Type	Status	Year	Primary Agency	Title/Description	Reason Cancelled
ma-AH-SU-194	All Hazard	Cancelled	2018	City of Suisun City	Develop the integral use of the Local Hazard Mitigation Plan by periodic review, maintenance and updating of the document. Incorporate appropriate updates into other City plans and City of Suisun City Local Hazard Mitigation Plan 178 documents such as the General Plan, Building Code, Zoning Ordinances, Site Plan Requirements and Disaster Emergency Response and Recovery Plans.	This is ongoing work under the HMP, not a specific mitigation action.
ma-AH-SU-195	All Hazard	Cancelled	2018	City of Suisun City	Through review and experience, identify and publicize updated hazard mitigation actions through community education, forums, and media. Include input from stakeholders and other agencies and jurisdictions, as appropriate, into the process.	Mitigation action is covered under new mitigation actions - MA-EQ-SU-128 & MA-WF-SU-135.
ma-AH-SU-196	All Hazard	Cancelled	2018	City of Suisun City	Stay informed of new standards and regulations in building requirements by working with County and State agencies tasked with their development. Use the information to update Building Codes and Land Use plans to reflect current requirements.	Already happening on an ongoing basis; not needed as mitigation action.

5.4 Risk Assessment

The intent of this section is to profile the City of Suisun City’s hazards and assess the City’s vulnerabilities, distinct from that of the County wide planning area. The hazard profiles in Volume 1 discuss overall impacts to the planning area and describes the hazard problem description, hazard extent, magnitude/severity, previous occurrences of hazard events and the likelihood of future occurrences. For more information on Risk Assessment Methodologies, see Vol. 1 and Appendix A.

5.4.1 Hazard Screening Criteria

Planning Team members from each participating jurisdiction collectively discussed which hazards should be profiled in the Plan and which should not. The results of that discussion can be found in Table 5-3. Detailed hazard profiles of the most significant County wide hazards are described in Section 4 of Volume 1. The Planning Team reviewed previously prepared hazard mitigation plans and other relevant documents to determine the realm of natural hazards that have the potential to affect the City of Suisun City. Table 5-4 provides a crosswalk of hazards identified in Vol. 1 of this plan, the City of Suisun City General Plan, and 2018 California State Hazard Mitigation Plan. The crosswalk was used to develop a preliminary hazards list, providing a framework for the Planning Team members to evaluate which hazards were truly relevant to the City of Suisun City and which ones were not. Section 5.4.2 below describes the hazard risk ranking process that was performed by the planning team which prioritized hazards that are specifically relevant to the City of Suisun City.



Table 5-3: County-Wide Hazard Prioritization

Hazard Type	Explanation
Climate Change	High priority county-wide, profiled hazard.
Dam/ Levee failure	Dam failure is possible in Solano County but is best addressed in other plans, specifically Emergency Action Plans for high hazard dams affecting Solano County.
Drought	High priority county-wide, profiled hazard.
Earthquake/ Geologic Hazards	High priority county-wide, profiled hazard.
Flood	High priority county-wide, profiled hazard.
Hazardous Material	While hazardous materials can release and impact the County, there are better avenues to address this hazard outside this plan.
High Winds/ Straight Line Winds	High priority county-wide, profiled as part of Extreme Weather.
Insect Hazards	While hazardous insects exist in Solano County, this was not considered a priority and is not profiled in this plan.
Pandemic Disease	While pandemic disease can impact the County, there are better avenues to address this hazard outside this plan.
Extreme Weather, including:	High priority county-wide for high wind, heavy rain, and high heat.
Extreme Heat	Profiled as part of Extreme Weather.
Hail	Hail events are rare and not considered a priority.
High Wind	Profiled as part of Extreme Weather.
Heavy Rain	Profiled as part of Extreme Weather.
Fog	Fog events are rare and are not considered a priority.
Lightning	Not a priority as an extreme weather event; discussed as source of wildfire.
Severe Thunderstorm	Severe thunderstorms were not identified as a priority in this plan.
Winter Storm / Extreme Cold/ Freeze Events	Winter storms are rare in Solano County and not identified as a priority for this plan.
Slope Failure	High priority county-wide, profiled hazard.
Soil Hazards	While limited soil hazards exist in Solano County (erosion and shifting soils), these are not prioritized in this plan. Erosion discussed under flood hazard.
Terrorism/Human Caused Threats	While terrorism is certainly a threat to the County and participating jurisdictions, it is best addressed in other plans as this HMP does not address human-caused threats.
Tornado	Impacts to the County from tornados are extremely unlikely, if any.
Volcanic Activity	Due to distance from volcanoes and the limited chance of an eruption, this hazard was not identified as a priority.
Wildfire	High priority county-wide, profiled hazard.



Table 5-4: City Document Review Crosswalk

Hazards	2015 Suisun General Plan	2017 Suisun HMP	2014 Solano County HMP	2018 California HMP
Agricultural Pests				■
Climate Change			■	■
Dam Failure			■	■
Drought			■	■
Earthquake	■	■	■	■
Flood	■	■	■	■
Landslide	■		■	■
Levee Failure				■
Manmade Hazards	■			■
Pandemic Disease				■
Sea Level Rise			■	■
Severe Weather		■	■	■
Soil Hazards	■			■
Terrorism & Tech Hazards	■			■
Tsunami				■
Volcano				■
Wildfire	■	■	■	■

5.4.2 Hazard Risk Ranking

The City of Suisun City’s Planning Team used the same hazard prioritization process as the Solano County Hazard Mitigation Planning Committee. This process is described in detail in Section 4.3.1 of Vol. 1. Figure 5-2 displays the results of the hazard risk ranking exercise that was performed by the Planning Team. The Planning Team chose to assess the City of Suisun City’s vulnerability to the following hazards:

- Wildfire
- Earthquake
- Flood
- Extreme Weather (high wind, heavy rain, and high heat)
- Climate Change

All these hazards have been profiled in Vol. 1 of this document. The purpose of this annex to specifically address the City of Suisun City’s vulnerability to these specifically-identified hazards.

5.4.3 Vulnerability Assessment

Assessing vulnerabilities exposes the unique characteristics of individual hazards and begins the process of narrowing down which areas within the City of Suisun City are vulnerable to specific hazard events. The vulnerability assessment considered unique local knowledge of hazards and impacts and a GIS overlaying method for examining such vulnerabilities more in depth. Using these methods, participating jurisdictions estimated vulnerable populations, infrastructure, and potential losses from hazards.



5.4.3.1 Risk Assessment

Each participating jurisdiction developed a risk matrix that assessed the probability and impact of various hazards within the jurisdiction. Figure 5-2 is the jurisdiction's risk assessment, which was completed in part using the web based and interactive Risk Assessment Mapping Platform (RAMP), accessed via the project website at www.mitigatehazards.com. RAMP allows interactive discovery of robust risk, vulnerability, and exposure data developed especially for Solano County. RAMP is a mapping platform built specifically for mitigation planning. It displays County/jurisdiction facilities and buildings overlaid with natural hazards layers to bring interactivity and individual discovery to the GIS analysis performed for the MJHMP. See Vol. 1 for a detailed description of RAMP. The Planning Team used RAMP in meetings and as needed to understand vulnerabilities to the City of Suisun City. Users interactively filter facilities and buildings by natural hazard zones and/or construction characteristics. The City of Suisun City also conducted a more detailed climate vulnerability assessment, included as Appendix A to this. The climate vulnerability assessment analyzed climate-related vulnerabilities by considering the impact from the climate vulnerability and the community's adaptive capacity to respond to the particular vulnerability.

5.4.3.2 Exposure Maps and Damage Estimation

The included snapshot maps and damage estimation tables illustrate the City of Suisun City's vulnerability to specific hazards. Based on the risk assessment, the snapshot maps focus on those hazards prioritized by the jurisdiction. These maps helped the Planning Team understand the exposure of population, parcels, and critical infrastructure to specific hazards. Each map contains an exposure summary that displays the percent of the population, the improvement and content value of parcels, and the amount of critical infrastructure that is exposed to each respective hazard. For flood and earthquake, detailed damage estimations were conducted through FEMA's Hazus software and are shown in tabular form. Additional mapping is also included. Figures and tables include:

- Figure 5-3: Suisun City - Wildfire Risk Exposure
- Figure 5-4: Suisun City - Mean Fire Return Interval
- Figure 5-5: Suisun City - FEMA Flood Risk Exposure
- Table 5-5: Suisun City - Damage Estimate Summaries, 100YR Flood
- Table 5-6: Suisun City - Damage Estimate Summaries, 500YR Flood
- Figure 5-7: Suisun City - Hayward Rodger's Creek EQ Scenario (M7.1)
- Table 5-7: Suisun City - Hayward Rodger's Creek Damage Estimate Summaries
- Figure 5-8: Suisun City - Concord Green Valley EQ Scenario (M6.8)
- Table 5-8: Suisun City - Concord Green Valley Damage Estimate Summaries
- Figure 5-9: Suisun City - Areas with Potential for Liquefaction
- Figure 5-10: Suisun City - 30-YR Normal Maximum Temperature for July
- Figure 5-11: Suisun City - Average Annual Precipitation
- Figure 5-12: Suisun City - Average Annual Wind Speed (Power Class)
- Figure 5-13: Suisun City - RCP Comparison
- Figure 5-14: Suisun City - Sea Level Rise Exposure



Risk Assessment Matrix Definitions

PROBABILITY RATING

The likelihood of a hazard event occurring within a time period?

PROBABILITY	Highly Likely	Highly likely - 100% annual probability. Or likely to occur every year in your lifetime.
	Likely	Likely - Between 10 and 100% annual probability. Or will occur several times in your lifetime.
	Possible	Possible - Between 1 and 10% annual probability. Or likely to occur some time in your lifetime.
	Unlikely	Unlikely - Less than 1% annual probability. Or unlikely but possible to occur in your lifetime.

IMPACT RATING

In terms of injuries, damage, or death, would you anticipate impacts to be minor, limited, critical, or catastrophic when a significant hazard event occurs? The impact could be in terms of one hazard event (flooding from a culvert failure) or a large-scale event (multiple rivers flooding) in the same jurisdictional boundary.

IMPACT			
Minor	Limited	Critical	Catastrophic
Minor - Very few injuries, if any. Only minor property damage and minimal disruption on quality of life. Temporary shutdown of critical facilities.	Limited - Minor injuries only. Approx. 10% or less of property in disaster footprint damaged or destroyed. Complete shutdown of critical facilities for more than one day.	Critical - Multiple deaths/injuries possible. Between 25% and 50% of property in disaster footprint is damaged or destroyed. Complete shutdown of critical facilities for more than one week.	Catastrophic - High number of deaths/injuries possible. More than 50% of property in affected area damaged or destroyed. Complete shutdown of critical facilities for 30 days or more.

To concentrate resources on highest priority hazards, the jurisdictional planning team will focus on "High" and "Extreme" risk hazards in this annex. These hazards have higher probability and greater impact as it relates to the jurisdiction's planning area.

Hazard definitions are included in Vol. 1 of this plan.

Hazard Information / Legend:



Climate Change is prioritized for all jurisdictions.

Sea-Level Rise is a subhazard of climate change for some jurisdictions (County, Vallejo, Benicia, Suisun City, Fairfield).



Extreme Weather in Solano County includes high heat, high wind, and heavy rain.



If a hazard symbol is grey, the planning team did not develop hazard vulnerability information due to lower perceived probability and impact.

City Of Suisun City Risk Matrix

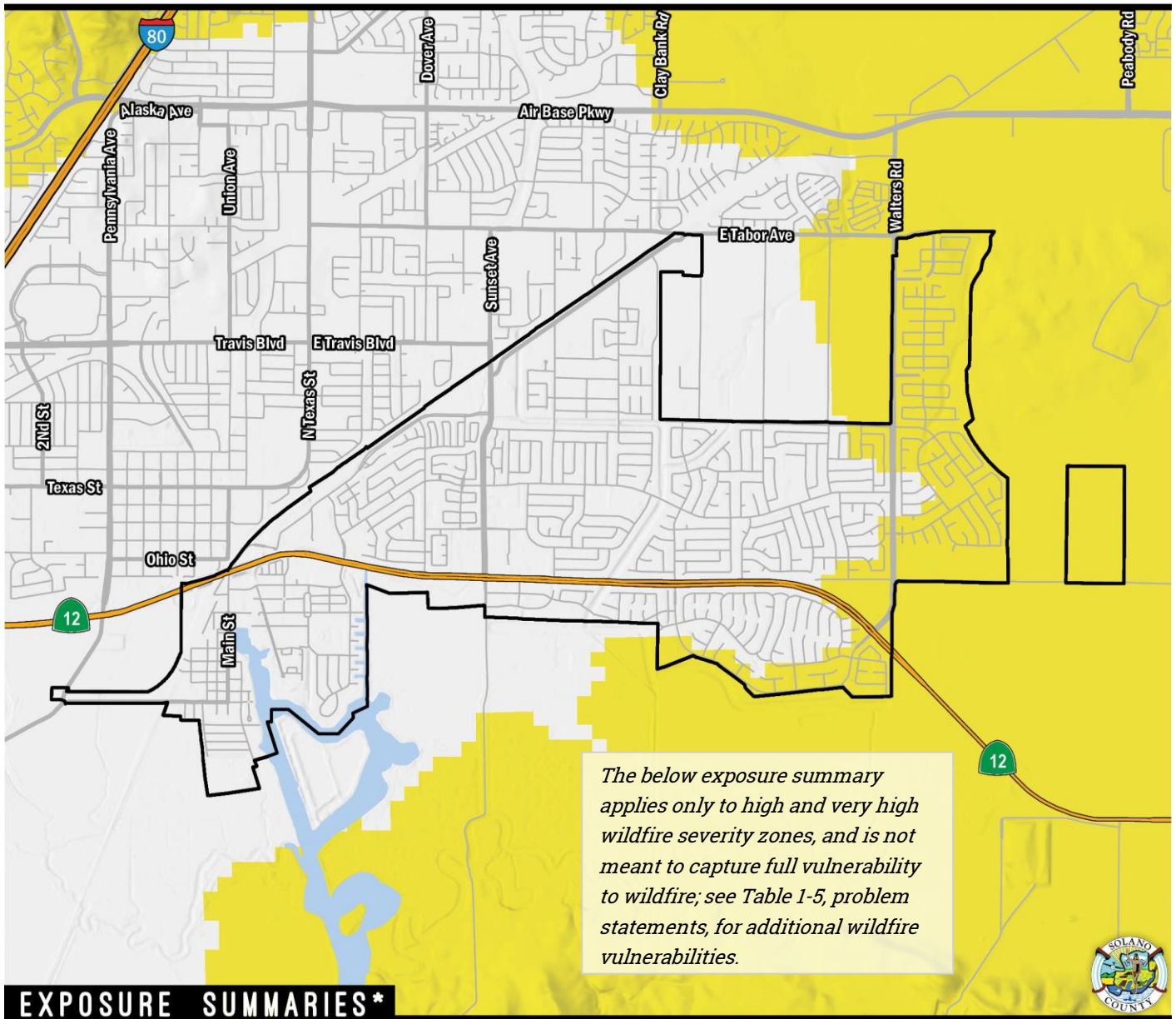
		IMPACT			
		Minor	Limited	Critical	Catastrophic
PROBABILITY	Highly Likely	DROUGHT	High	WILDFIRE	Extreme
	Likely	Medium	FLOOD	EXTREME WEATHER EARTHQUAKE	Extreme
	Possible	Low	Medium	High	High
	Unlikely	SLOPE FAILURE	Low	Medium	Medium

Figure 5-2: City of Suisun City Risk Assessment



WILDFIRE RISK EXPOSURE

SUISUN CITY



The below exposure summary applies only to high and very high wildfire severity zones, and is not meant to capture full vulnerability to wildfire; see Table 1-5, problem statements, for additional wildfire vulnerabilities.

EXPOSURE SUMMARIES*

POPULATION COUNT IN HAZARD AREA	
Count	Exp. Rate**
0	0%
Count Includes: 	

PARCEL COUNT IN HAZARD AREA	
Count	Exp. Rate**
0	0%
Count Includes: 	

PARCEL VALUE IN HAZARD AREA	
Sum of Improvement Value	Exp. Rate**
\$0	0%
Sum of Content Value	Exp. Rate**
\$0	0%
Count Includes: 	

CRITICAL INFRASTRUCTURE COUNTS IN HAZARD AREA			
Infrastructure Category	Count	Exp. Rate**	Count/Sum Includes:
Essential Facilities	0	0%	
High Potential Loss	0	0%	Sum of Transportation & Lifeline Linear Mileage
Transportation & Lifeline	0	0%	

MAP LEGEND

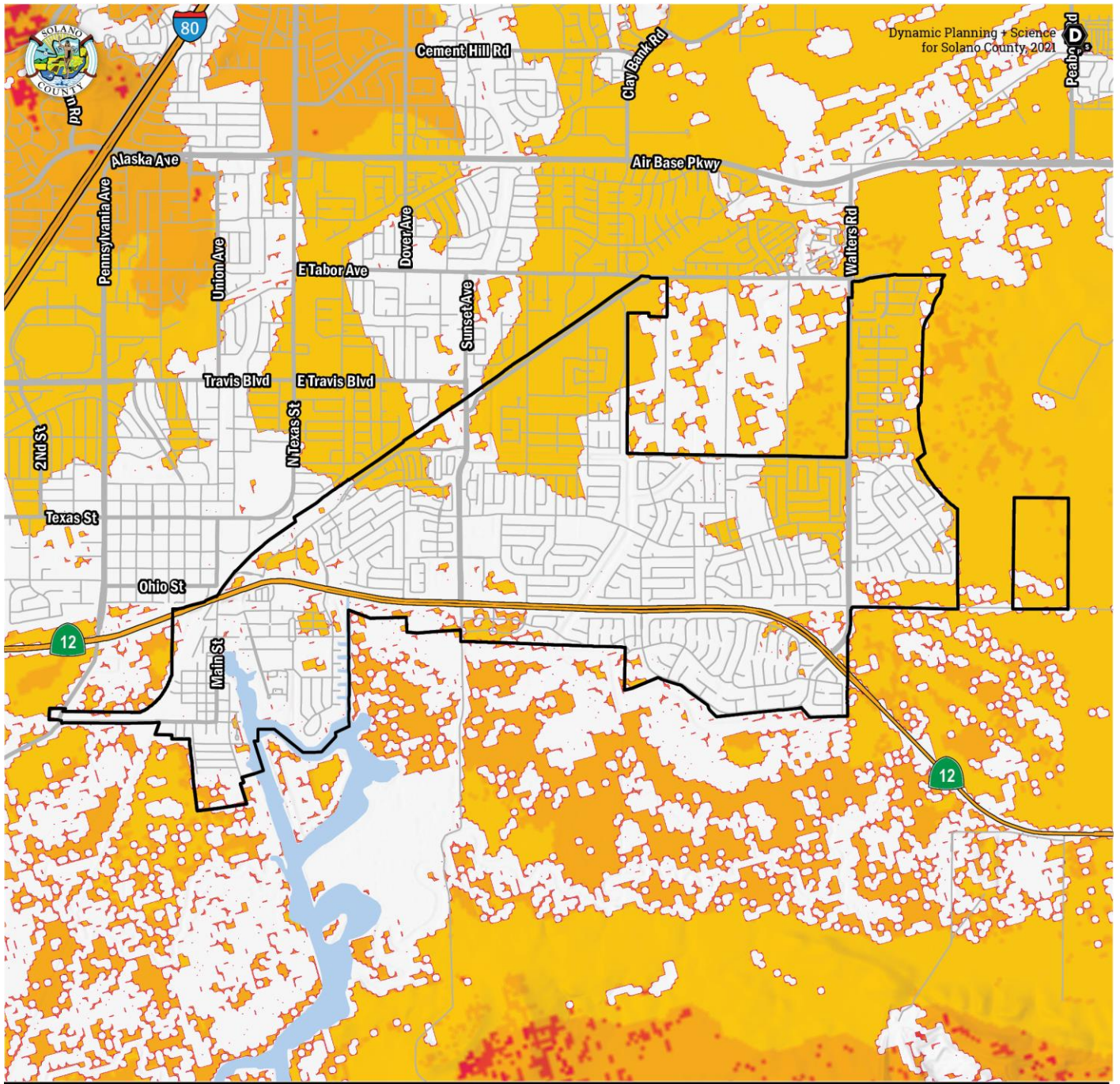
MODERATE

HIGH (H)

VERY HIGH (VH)

*Exposure summaries include high and very high risk areas. Hazard data source: Cal Fire, CPUC.
 **Exposure Rate - Exposed summary or count as a percentage of total summary or count within jurisdiction.
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Figure 5-3: Suisun City - Wildfire Risk Exposure



MEAN FIRE RETURN INTERVAL SUISUN CITY

*Data sources: USGS LANDFIRE.

AVERAGE PERIOD BETWEEN FIRES (YEARS)

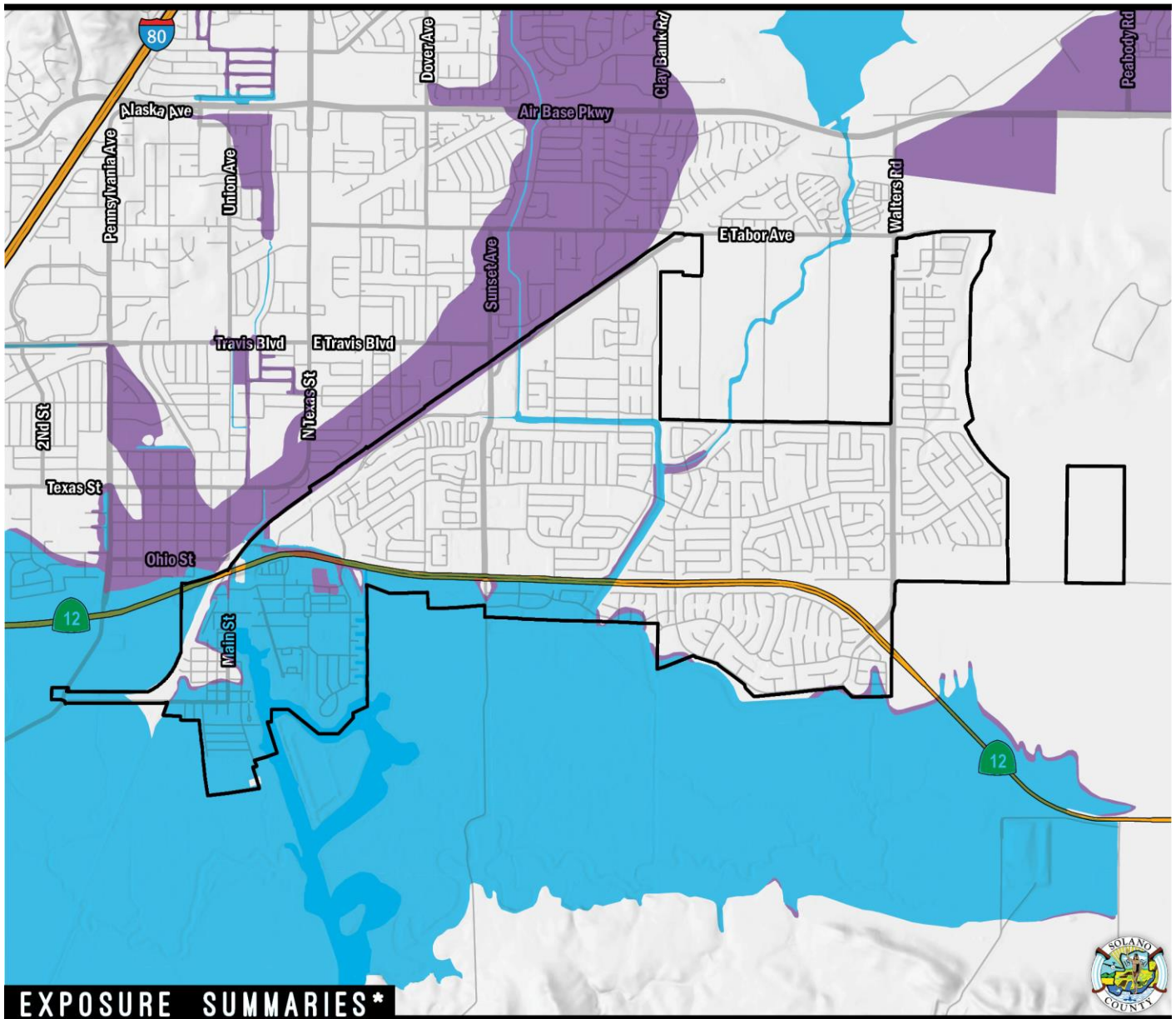


Figure 5-4: Suisun City - Mean Fire Return Interval



FEMA FLOOD RISK EXPOSURE

SUISUN CITY



EXPOSURE SUMMARIES*

POPULATION COUNT
IN HAZARD AREA

Count	Exp. Rate**
3,276	11%
Count Includes:	100 + + 500

PARCEL COUNT
IN HAZARD AREA

Count	Exp. Rate**
882	11%
Count Includes:	100 + + 500

PARCEL VALUE
IN HAZARD AREA

Sum of Improvement Value	Exp. Rate**
\$492,548,244	13%
Count Includes:	100 + + 500

Sum of Content Value	Exp. Rate**
\$296,405,605	14%
Count Includes:	100 + + 500

CRITICAL INFRASTRUCTURE COUNTS
IN HAZARD AREA

Infrastructure Category	Count	Exp. Rate**	Count/Sum Includes:
Essential Facilities	2	67%	100 + + 500
High Potential Loss	35	25%	Sum of Transportation & Lifeline Linear Mileage
Transportation & Lifeline	34	24%	30 23%



*Exposure summaries include 100-year and 500-year flood zone areas, including coastal and leveed areas. Hazard data source: FEMA.

**Exposure Rate - Exposed summary or count as a percentage of total summary or count within jurisdiction.

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Figure 5-5: Suisun City - FEMA Flood Risk Exposure



Table 5-5: Suisun City - Damage Estimate Summaries, 100YR Flood

Building Type	Building Damage (\$)	Building Damage (% of total loss)	Content Damage (\$)	Content Damage (% of total loss)	Total Damage (\$)	Proportion of Loss (%)
Agriculture	\$0	0.0%	\$0	0.0%	\$0	0%
Commercial	\$4,513,767	3.7%	\$12,756,296	10.4%	\$17,270,062	14%
Education*	\$0	0.0%	\$0	0.0%	\$0	0%
Emergency	\$0	0.0%	\$0	0.0%	\$0	0%
Government	\$701,527	0.6%	\$114,683	0.1%	\$816,210	1%
Industrial	\$7,114	0.0%	\$30,541	0.0%	\$37,655	0%
Religion	\$51,854	0.0%	\$437,304	0.4%	\$489,158	0%
Residential	\$78,160,698	63.5%	\$26,226,628	21.3%	\$104,387,326	85%
Total	\$83,434,960	68%	\$39,565,452	32%	\$123,000,411	

*School district asset information not available during time of Hazus analysis.

Note: Total Inventory Values

1 - Building Replacement Costs = \$3,773,922,295

2 - Content Replacement Costs = \$2,667,166,517

3 - Total Value = \$6,441,088,812

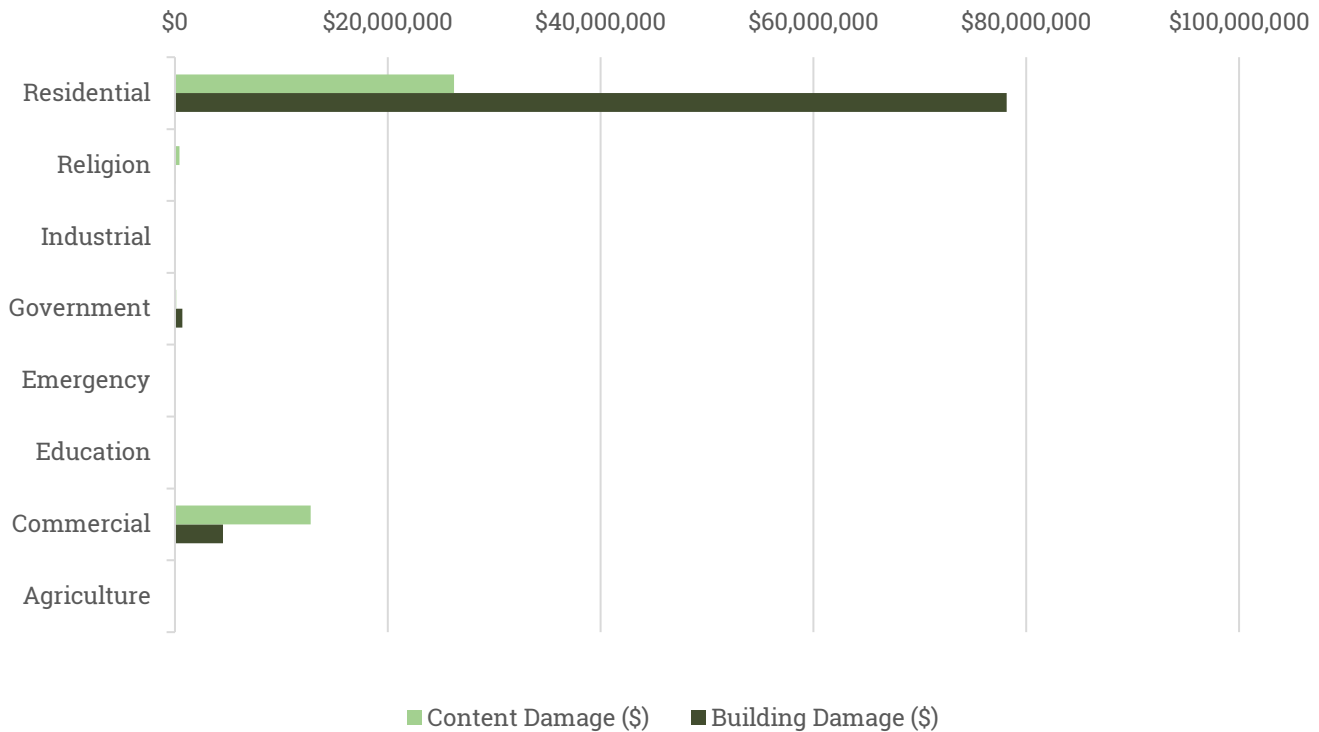




Table 5-6: Suisun City - Damage Estimate Summaries, 500YR Flood

Building Type	Building Damage (\$)	Building Damage (% of total loss)	Content Damage (\$)	Content Damage (% of total loss)	Total Damage (\$)	Proportion of Loss (%)
Agriculture	\$0	0.0%	\$0	0.0%	\$0	0%
Commercial	\$19,227	0.7%	\$41,094	1.6%	\$60,321	2%
Education*	\$0	0.0%	\$0	0.0%	\$0	0%
Emergency	\$0	0.0%	\$0	0.0%	\$0	0%
Government	\$0	0.0%	\$0	0.0%	\$0	0%
Industrial	\$32	0.0%	\$0	0.0%	\$32	0%
Religion	\$0	0.0%	\$0	0.0%	\$0	0%
Residential	\$1,898,073	72.9%	\$645,713	24.8%	\$2,543,786	98%
Total	\$1,917,332	74%	\$686,808	26%	\$2,604,140	

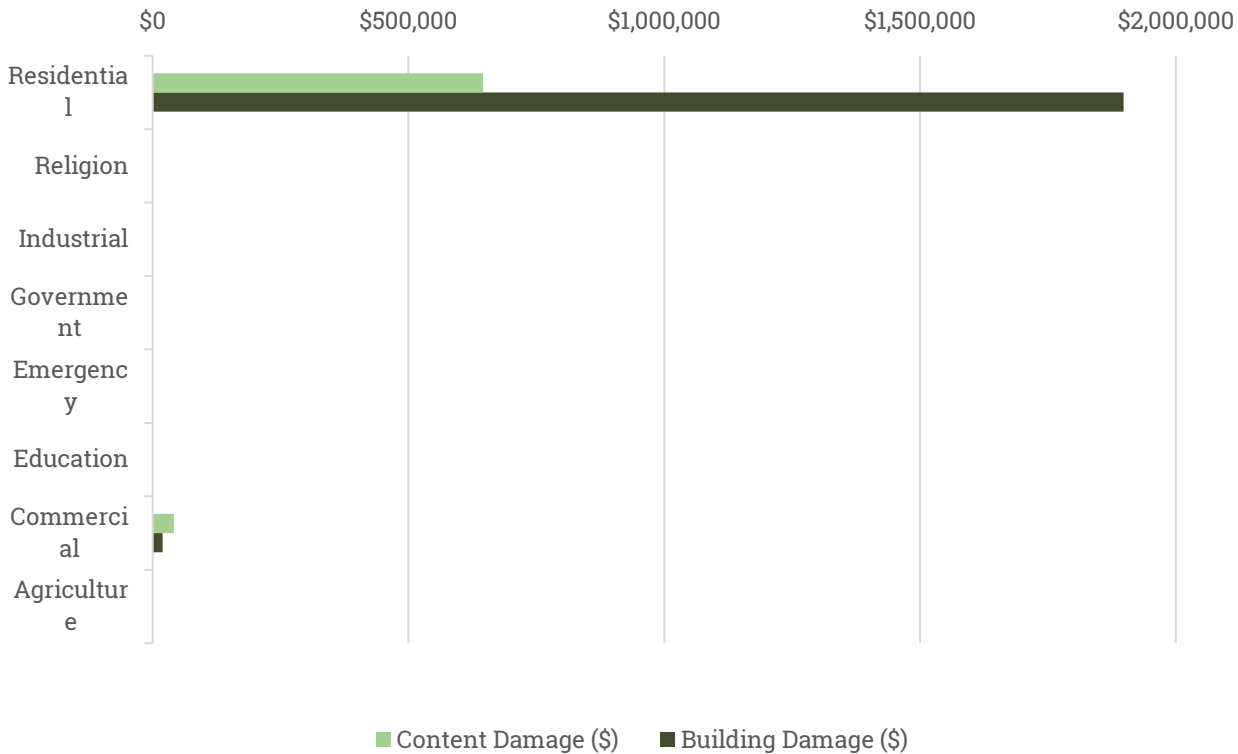
*School district asset information not available during time of Hazus analysis.

Note: Total Inventory Values

1 - Building Replacement Costs = \$3,773,922,295

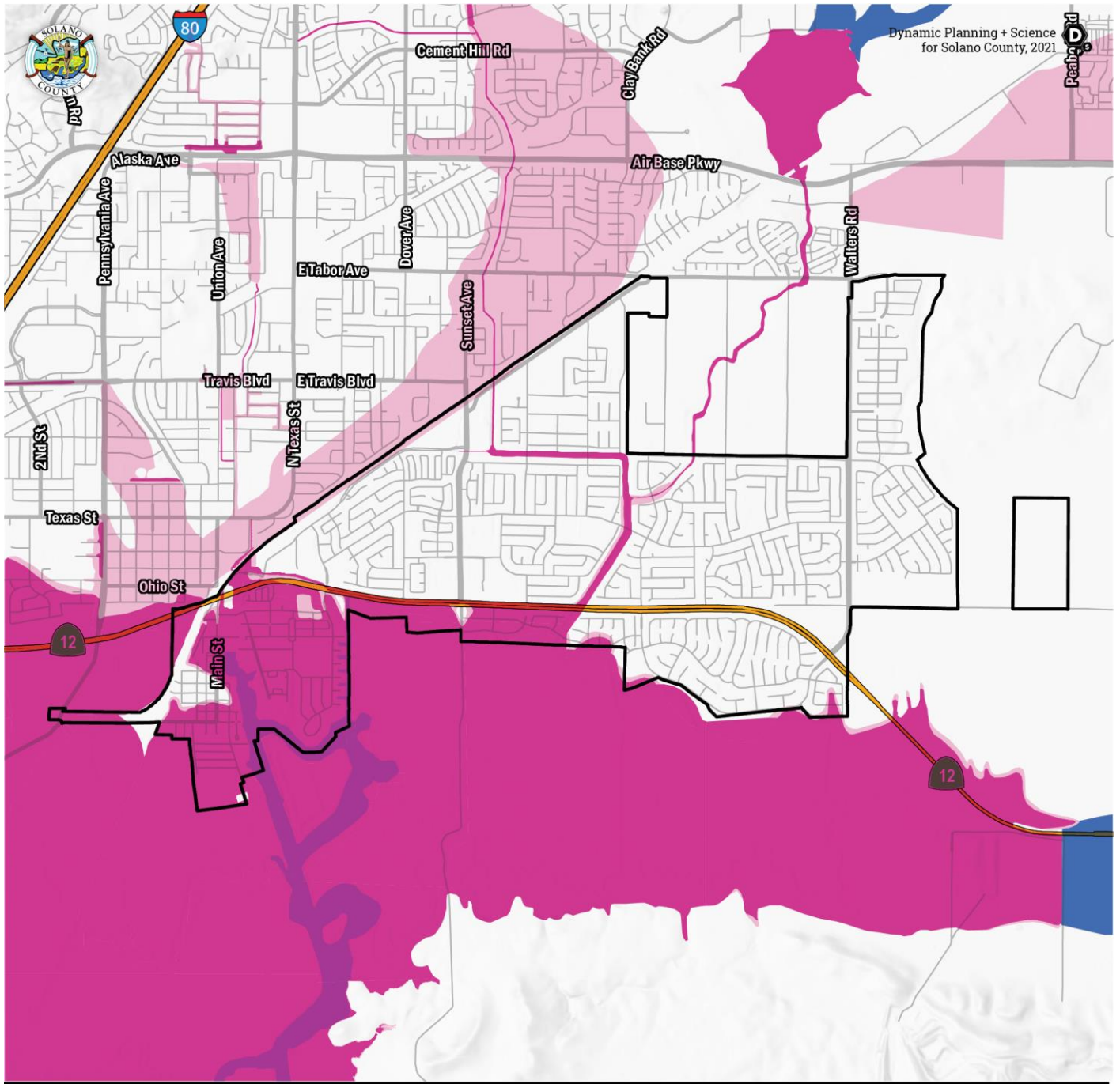
2 - Content Replacement Costs = \$2,667,166,517

3 - Total Value = \$6,441,088,812





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BAM 200-YR FLOODING AND AWARENESS ZONES SUISUN CITY

*Data sources: DWR.

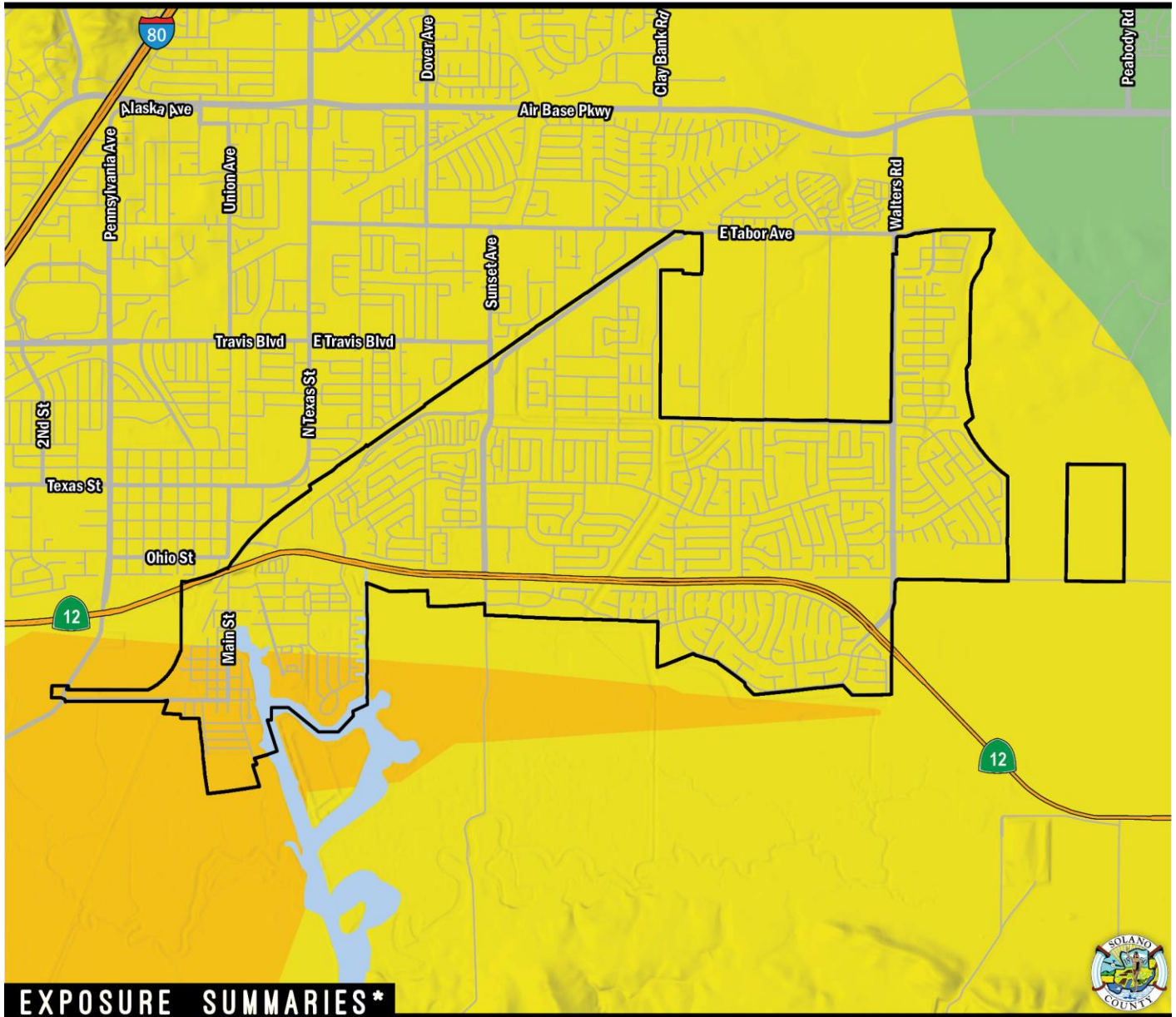


Figure 5-6: Suisun City - BAM 200YR Flooding and Awareness Zones



HAYWARD-RODGER'S CREEK EARTHQUAKE SCENARIO (M7.1)

SUISUN CITY



EXPOSURE SUMMARIES *

POPULATION COUNT
IN HAZARD AREA

Count	Exp. Rate**
29,379	100%
Count Includes: S+++E	

PARCEL COUNT
IN HAZARD AREA

Count	Exp. Rate**
8,210	100%
Count Includes: S+++E	

PARCEL VALUE
IN HAZARD AREA

Sum of Improvement Value	Exp. Rate**
\$3,878,378,775	100%
Sum of Content Value	Exp. Rate**
\$2,165,387,111	100%
Count Includes: S+++E	

CRITICAL INFRASTRUCTURE COUNTS
IN HAZARD AREA

Infrastructure Category	Count	Exp. Rate**	Count/Sum Includes:
Essential Facilities	3	100%	S+++E
High Potential Loss	140	100%	Sum of Transportation & Lifeline Linear Mileage
Transportation & Lifeline	143	100%	132 100%

MAP LEGEND

III	IV	V	VI	VII	VIII	IX	X
WEAK	LIGHT	MODERATE	STRONG	VERY STRONG	SEVERE	VIOLENT	EXTREME
MMI							

*Exposure summaries include strong, very strong, violent, and severe MMI classes. Hazard data source: USGS.

**Exposure Rate - Exposed summary or count as a percentage of total summary or count within jurisdiction.

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Figure 5-7: Suisun City - Hayward Rodger's Creek EQ Scenario (M7.1)



Table 5-7: Suisun City - Hayward Rodger's Creek Damage Estimate Summaries

Building Type	Average of Potential Damage to Exceed "Slight"	Average of Potential Damage to Exceed "Moderate"	Average of Potential Damage to Exceed "Extensive"	Average Economic Loss for Each Building Category	Sum of Economic Loss	Proportion of Loss (%)
Agriculture	23%	10%	1%	\$1,572	\$1,572	0%
Commercial	15%	4%	1%	\$50,230	\$4,219,345	11%
Education*	0%	0%	0%	\$0	\$0	0%
Emergency	9%	2%	0%	\$18,526	\$37,051	0%
Government	12%	5%	1%	\$21,760	\$718,064	2%
Industrial	21%	8%	1%	\$99,412	\$2,882,958	8%
Religion	13%	2%	0%	\$15,107	\$120,852	0%
Residential	7%	0%	0%	\$3,634	\$29,391,140	79%
Total					\$37,370,982	

*School district asset information not available during time of Hazus analysis.

Note: Total Inventory Values

1 - Building Replacement Costs = \$3,773,922,295

2 - Content Replacement Costs = \$2,667,166,517

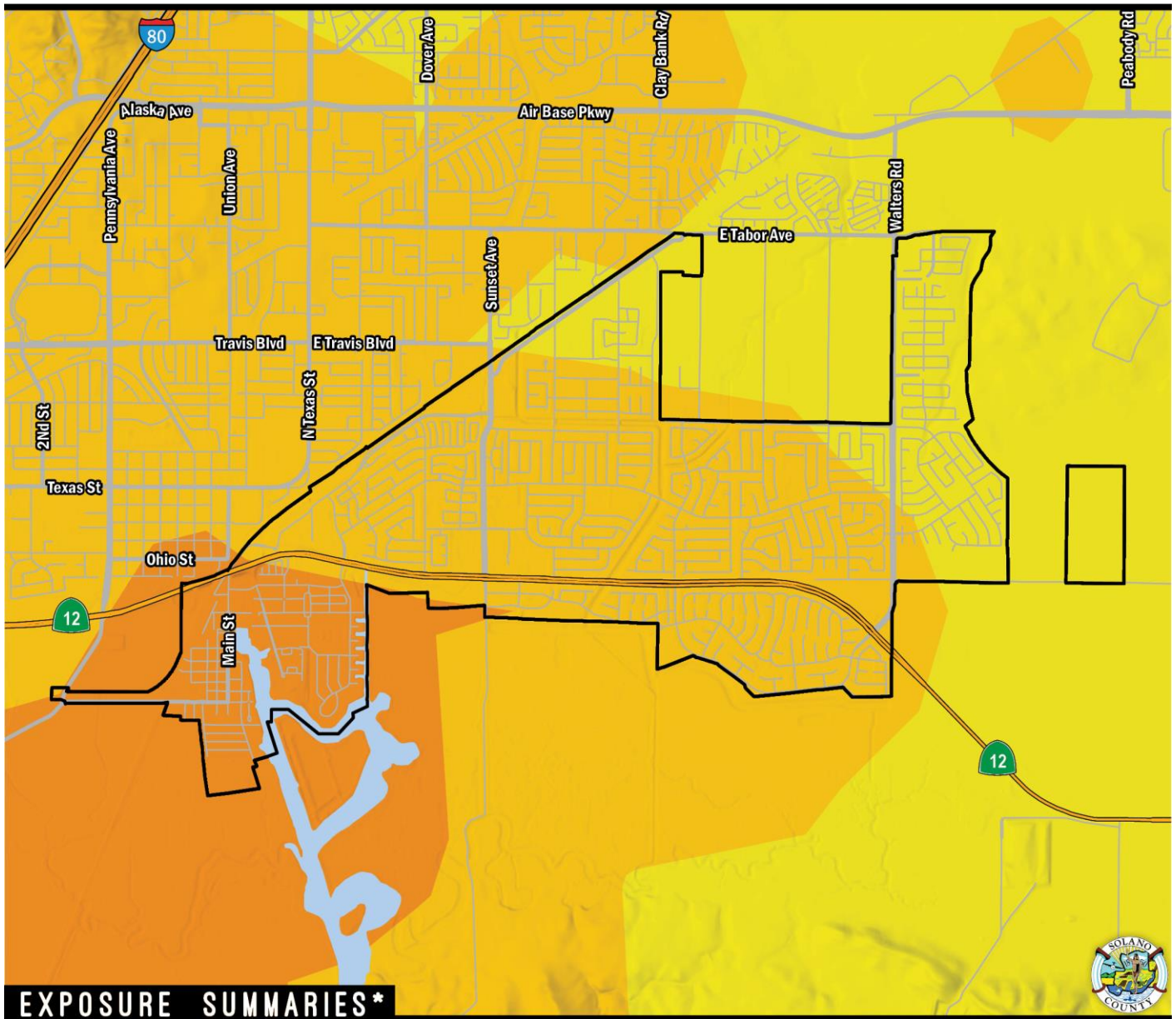
3 - Total Value = \$6,441,088,812





CONCORD-GREEN VALLEY EARTHQUAKE SCENARIO (M6.8)

SUISUN CITY



EXPOSURE SUMMARIES *

POPULATION COUNT IN HAZARD AREA		PARCEL COUNT IN HAZARD AREA		PARCEL VALUE IN HAZARD AREA		CRITICAL INFRASTRUCTURE COUNTS IN HAZARD AREA			
Count	Exp. Rate**	Count	Exp. Rate**	Sum of Improvement Value	Exp. Rate**	Infrastructure Category	Count	Exp. Rate**	Count/Sum Includes:
29,379	100%	8,210	100%	\$3,878,378,775	100%	Essential Facilities	3	100%	S+++E
Count Includes: S+++E		Count Includes: S+++E		Sum of Content Value	100%	High Potential Loss	140	100%	Sum of Transportation & Lifeline Linear Mileage
				\$2,165,387,111	100%	Transportation & Lifeline	143	100%	132 100%
				Count Includes: S+++E					

MAP LEGEND

III	IV	V	VI	VII	VIII	IX	X
WEAK	LIGHT	MODERATE	STRONG	VERY STRONG	SEVERE	VIOLENT	EXTREME
MMI							

*Exposure summaries include strong, very strong, violent, and severe MMI classes. Hazard data source: USGS.

**Exposure Rate - Exposed summary or count as a percentage of total summary or count within jurisdiction.

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Figure 5-8: Suisun City - Concord Green Valley EQ Scenario (M6.8)



Table 5-8: Suisun City - Concord Green Valley Damage Estimate Summaries

Building Type	Average of Potential Damage to Exceed "Slight"	Average of Potential Damage to Exceed "Moderate"	Average of Potential Damage to Exceed "Extensive"	Average Economic Loss for Each Building Category	Sum of Economic Loss	Proportion of Loss (%)
Agriculture	47%	25%	5%	\$3,925	\$3,925	0%
Commercial	34%	12%	4%	\$174,092	\$14,623,739	12%
Education*	0%	0%	0%	\$0	\$0	0%
Emergency	24%	8%	1%	\$55,042	\$110,084	0%
Government	28%	13%	2%	\$58,603	\$1,933,907	2%
Industrial	48%	23%	4%	\$340,890	\$9,885,813	8%
Religion	35%	13%	2%	\$66,424	\$531,392	0%
Residential	22%	2%	0%	\$12,270	\$99,230,690	79%
Total					\$126,319,550	

*School district asset information not available during time of Hazus analysis.

Note: Total Inventory Values

1 - Building Replacement Costs = \$3,773,922,295

2 - Content Replacement Costs = \$2,667,166,517

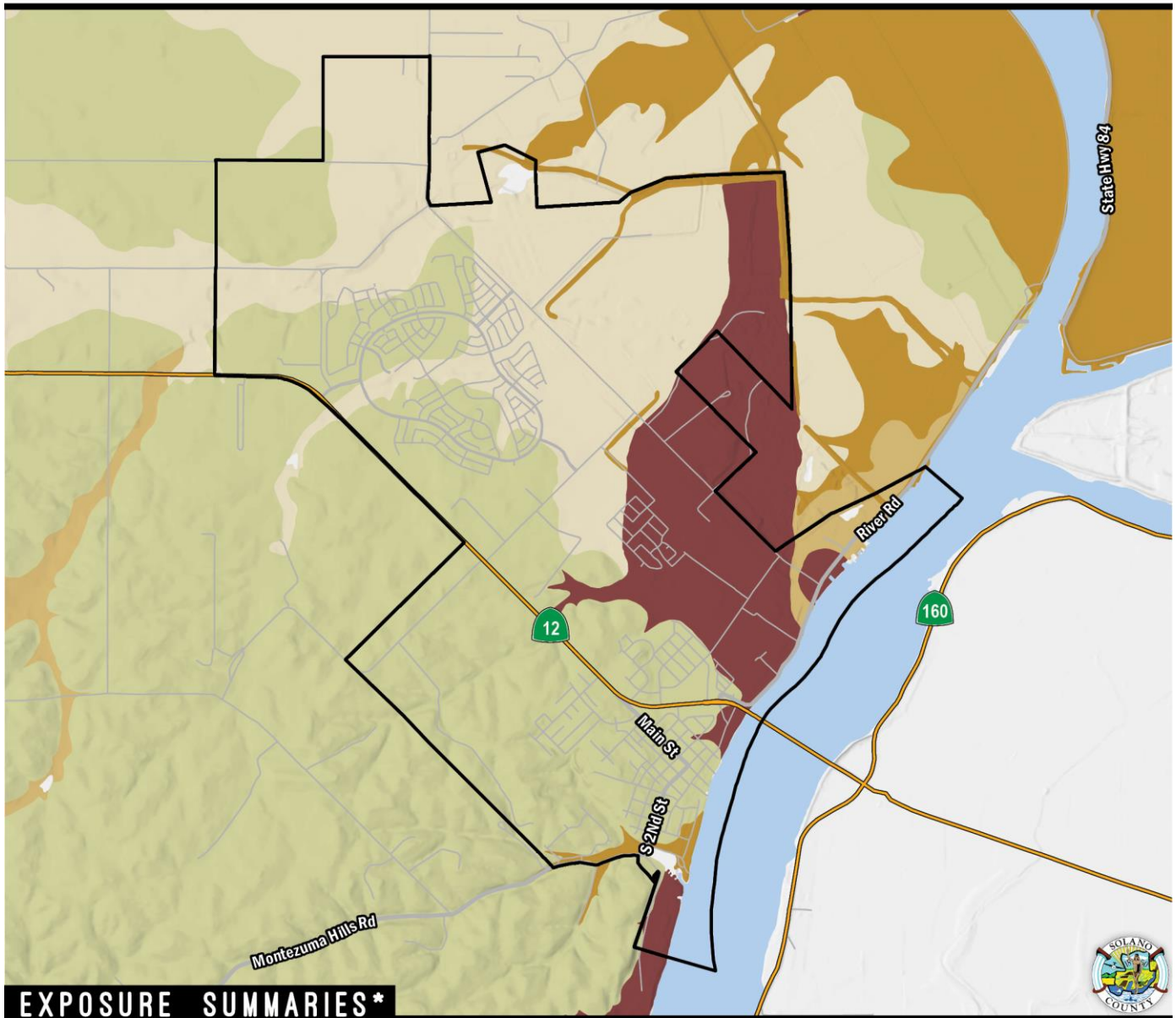
3 - Total Value = \$6,441,088,812





AREAS WITH POTENTIAL FOR LIQUEFACTION

RIO VISTA



EXPOSURE SUMMARIES *

POPULATION COUNT IN HAZARD AREA		PARCEL COUNT IN HAZARD AREA		PARCEL VALUE IN HAZARD AREA		CRITICAL INFRASTRUCTURE COUNTS IN HAZARD AREA			
Count	Exp. Rate**	Count	Exp. Rate**	Sum of Improvement Value	Exp. Rate**	Infrastructure Category	Count	Exp. Rate**	Count/Sum Includes:
3,348	39%	320	7%	\$167,294,585	8%	Essential Facilities	1	33%	M H VH
Count Includes:	M H VH	Count Includes:	M H VH	Sum of Content Value		High Potential Loss	38	38%	Sum of Transportation & Lifeline Linear Mileage
				\$126,118,858	11%	Transportation & Lifeline	1	13%	
				Count Includes:	M H VH				



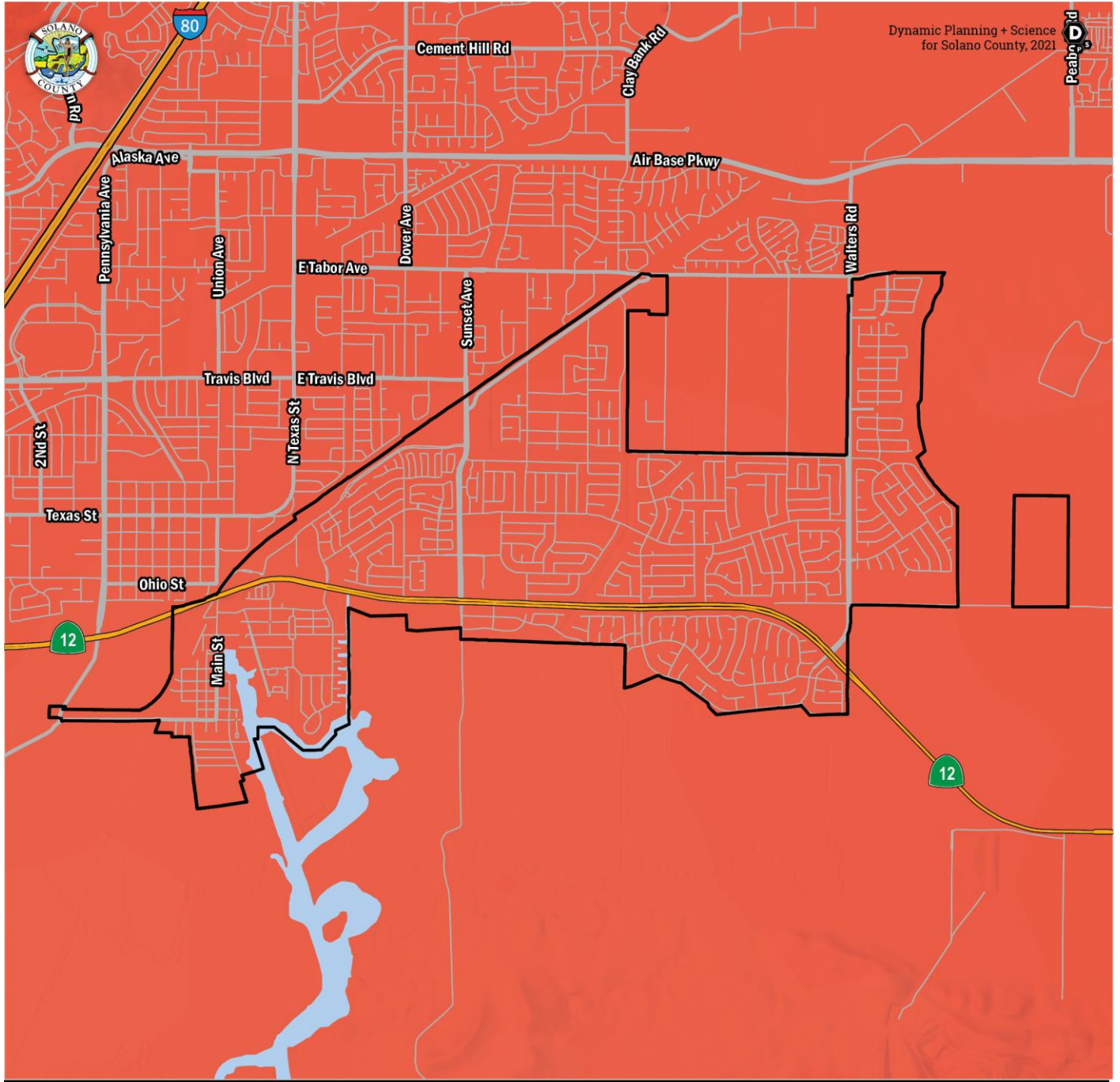
*Exposure summaries include medium, high, very high susceptibility. Hazard data source: USGS.
 **Exposure Rate - Exposed summary or count as a percentage of total summary or count within jurisdiction.

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Figure 5-9: Suisun City - Areas with Potential for Liquefaction



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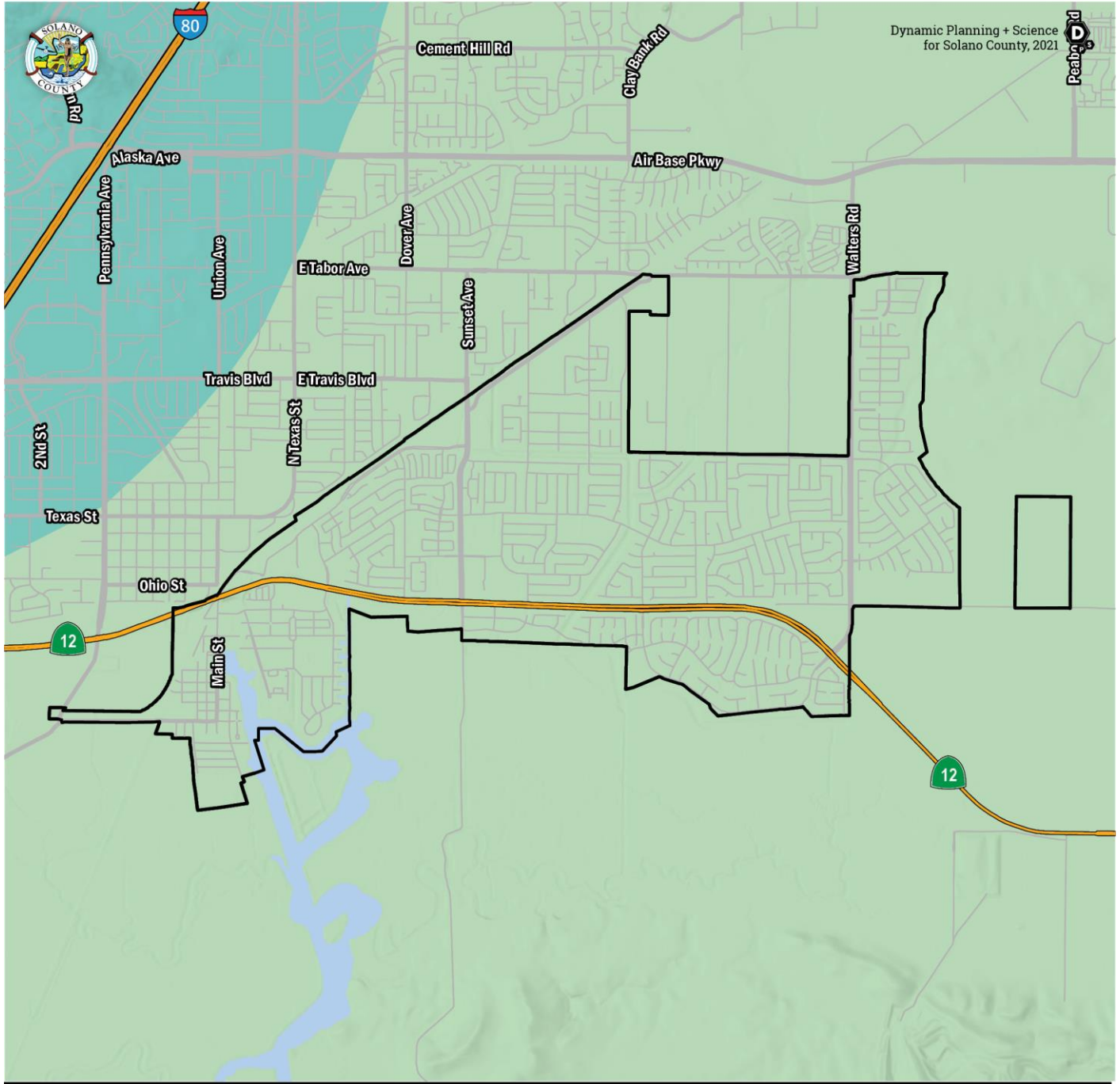


30-YR NORMAL MAXIMUM TEMPERATURE FOR JULY SUISUN CITY

*Data sources: PRISM 800m Resolution 30-YR Normals.



Figure 5-10: Suisun City - 30-YR Normal Maximum Temperature for July

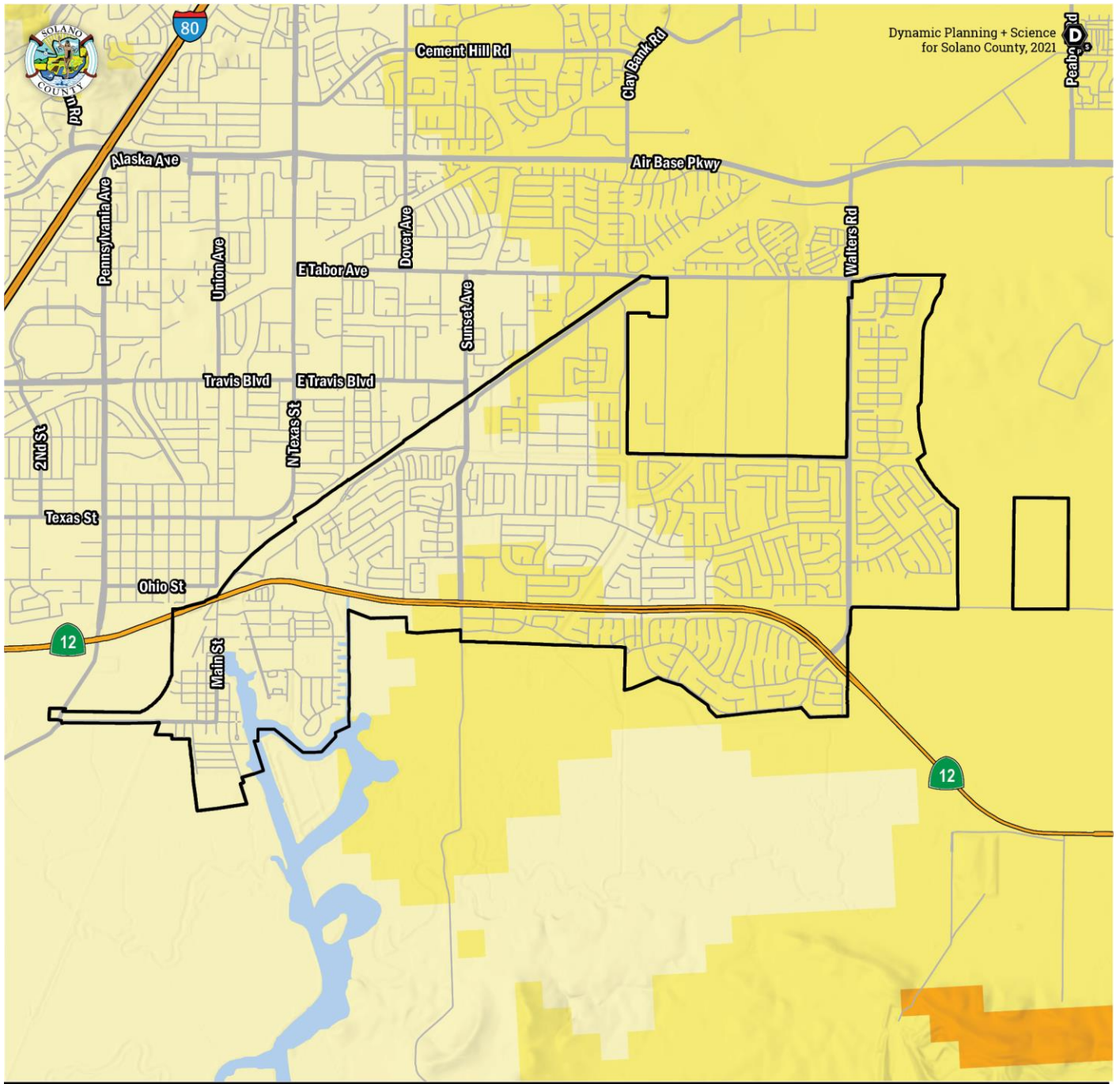


AVERAGE ANNUAL PRECIPITATION (1981-2010, INCHES)
SUISUN CITY

*Data sources: USDA - 1981-2010 Annual Average Precipitation by State.

14	18	23	28	33
17	22	27	32	37
INCHES				

Figure 5-11: Suisun City - Average Annual Precipitation (1981-2010)



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ANNUAL AVERAGE WIND SPEED (POWER CLASS)
SUISUN CITY

*Data sources: NREL.



Figure 5-12: Suisun City – Average Annual Wind Speed (Power Class)

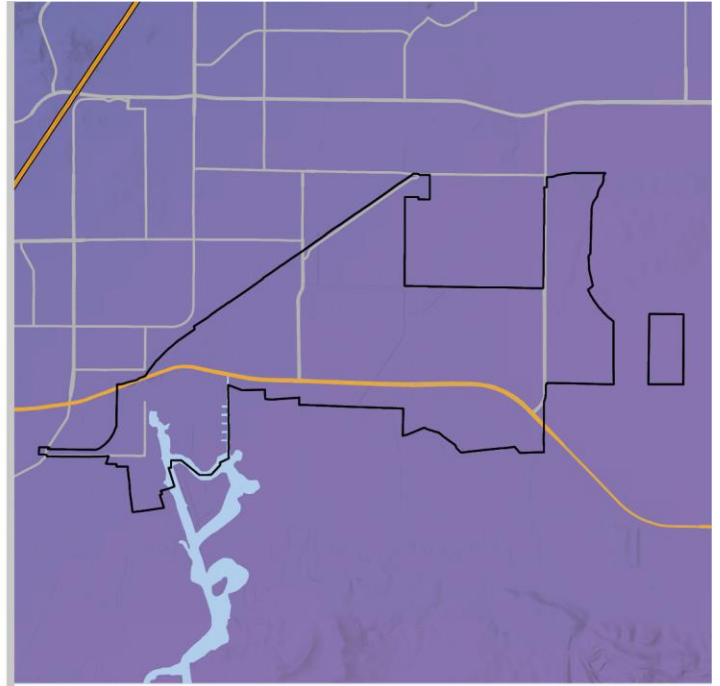


SUISUN CITY AVERAGE ANNUAL MAXIMUM TEMPERATURE

COMPARISON OF CURRENT OBSERVED TO RCP 4.5 AND RCP 8.5 SCENARIOS



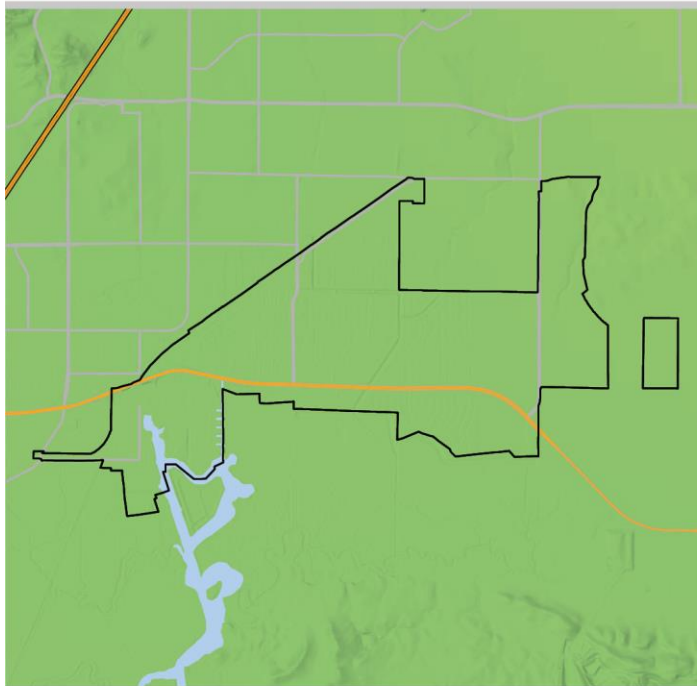
*Data sources: Cal-Adapt CanESM2 RCP 4.5 & 8.5, PRISM 30-YR Norms Annual Max Temp



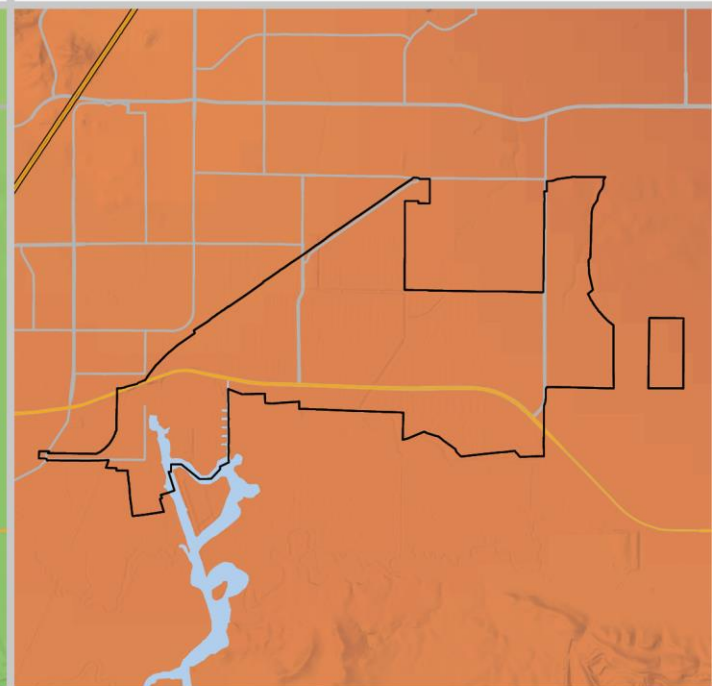
CURRENT 30-YR NORMAL



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RCP 4.5 YEAR 2100



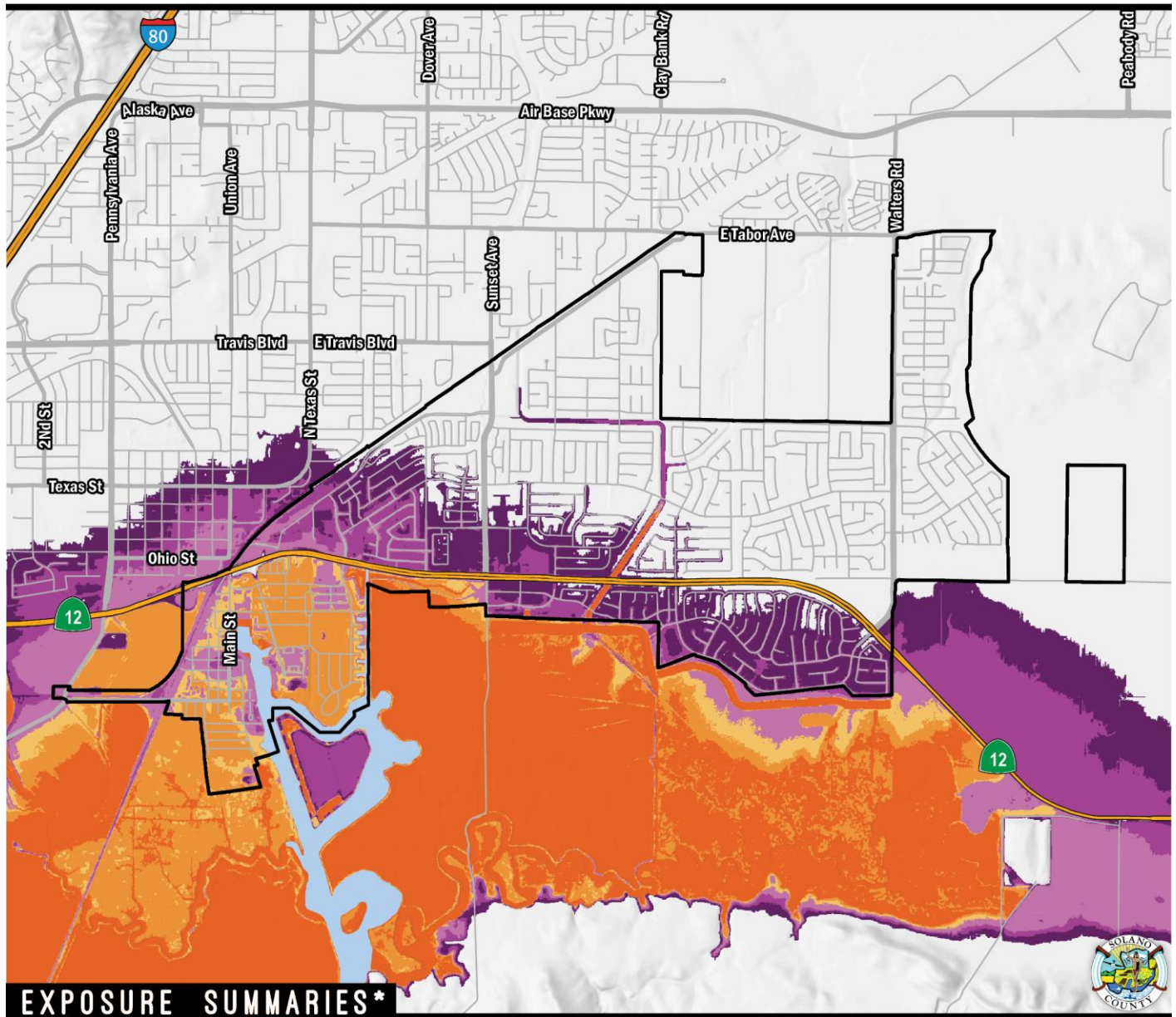
RCP 8.5 YEAR 2100

Figure 5-13: Suisun City - RCP Comparison



SEA LEVEL RISE EXPOSURE

SUISUN CITY



EXPOSURE SUMMARIES*

POPULATION COUNT IN HAZARD AREA

Count	Exp. Rate**
9,212	31%
Count Includes:	L+++E

PARCEL COUNT IN HAZARD AREA

Count	Exp. Rate**
2,716	33%
Count Includes:	L+++E

PARCEL VALUE IN HAZARD AREA

Sum of Improvement Value	Exp. Rate**
\$1,431,040,455	37%
Sum of Content Value	Exp. Rate**
\$824,825,653	38%
Count Includes:	L+++E

CRITICAL INFRASTRUCTURE COUNTS IN HAZARD AREA

Infrastructure Category	Count	Exp. Rate**	Count/Sum Includes:
Essential Facilities	2	67%	L+++E
High Potential Loss	82	59%	Sum of Transportation & Lifeline Linear Mileage
Transportation & Lifeline	70	49%	64 48%

MAP LEGEND

AMOUNT OF RISE

EXTREME (2.5M)	INTERMEDIATE (1.0M)
HIGH (2.0M)	INTERMEDIATE LOW (0.5M)
INTERMEDIATE HIGH (1.5)	LOW (0.3M)

*Exposure summaries include scenarios low rise to extreme rise. Hazard data source: NOAA.

**Exposure Rate - Exposed summary or count as a percentage of total summary or count within jurisdiction.

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Figure 5-14: Suisun City - Sea Level Rise Exposure



5.4.3.3 Past and Future Development

The City of Suisun City is a general law city that crafts its own development regulations and is subject to State law. Future development is subject to compliance with state and local planning, zoning, subdivision, and architecture laws.

The City of Suisun City's General Plan (GP) establishes long-range development policies. The GP is designed to help the City address issues related to land use, circulation (traffic), housing, open space, conservation, noise, and safety. The Land Use portion of the plan helps guide the City in determining the location of future development(s), including possible future annexation. In addition to the GP, the City has other plans that guide development in specific areas, including specific plans, policy plans, and master plans. These plans help to shape future development and dictate the City's Sphere of Influence (SOI). One of the central functions in these planning documents is to decrease risk of impact from natural hazards.

Development since Previous HMP

The City considered its growth since the last HMP and determined it is currently completing a significant mitigation activity that will substantially decrease its vulnerability to hazards. The City is currently developing a Flood Resiliency Plan to evaluate sea level rise impacts to flooding. This HMP Annex has been revised to reflect this substantial change in past development and continues to focus on avenues to better mitigate impacts from problematic past development.

Future Development

City of Suisun City is required to update building codes to meet the minimum standards to those required in the California Building Code last updated in 2019. California Building Codes provide some of the safest construction standards in the world and are meant to reduce risk to occupants from high wind, seismic activity, landslides, flood, wildfire, and other natural hazards. In addition to California minimum development standards, all jurisdictions belong to the NFIP, and all development must meet minimum flood protection standards set forth by FEMA. See Section 4.3.5 of Volume 1 for more information about past and future development in Solano County.

As the General Plan is updated and incorporates information from this HMP, City of Suisun City staff are continually improving hazard information through these hazard mitigation plan updates. With this 2020 update, improved online mapping about natural hazards available on RAMP will inform those responsible for future development to make better decisions where and how future development occurs.

City of Suisun City reviewed its general plans under the capability assessments undertaken for this hazard mitigation plan. See Section 5.5.1. Deficiencies revealed by these reviews are identified as mitigation actions to decrease risks to move beyond past trends.



The City's municipal codes includes regulations to mitigate the impact of hazards on new and existing development, including:

- Drainage and stormwater retention requirements,
- Steep slope restrictions for new development,
- Waterbody buffer requirements,
- Floodplain management regulations,
- Zoning that prevents development in hazardous areas of the community such as floodplains, landslide areas, the wildland-urban interface (WUI), or other known hazard areas, and
- Building codes that include the most up-to-date California Fire Code, seismic standards, and many other provisions crafted to protect new construction from hazard events.

Even in the event that limited development did occur within a hazard area, the municipal code should ensure impacts from a hazard event are mitigated and losses are minimal. If development does occur in hazard areas, evacuation and emergency planning should take into consideration the anticipated local impacts of the hazard event, including potential interrupted services or the elimination of access.

The anticipated growth in the City will not cause significant change in vulnerability to the City for identified priority hazards.

National Flood Insurance Program (NFIP)

The NFIP makes federally backed flood insurance available to homeowners, renters, and business owners in participating communities. FEMA has prepared a detailed Flood Insurance Study (FIS) for Solano County and municipalities. The study presents water surface elevations for floods of various magnitudes, including the 1-percent annual chance flood and the 0.2-percent annual chance flood (the 500-YR flood). Base flood elevations and the boundaries of the 100- and 500-YR floodplains are shown on Flood Insurance Rate Maps (FIRMs), which are the principal tools for identifying the extent and location of the flood hazard. FIRMs are the most detailed and consistent data source available, and for many communities they represent the minimum area of oversight under their floodplain management program. See Section 4 of Volume 1 for general information on the NFIP.

The City of Suisun City has participated in the NFIP since 1982. The City of Suisun City is currently in good standing with the provisions of the NFIP. Compliance is monitored by FEMA regional staff and by the California Department of Water Resources under a contract with FEMA. Maintaining compliance under the NFIP is an important component of flood risk reduction. See Table 5-9 for more information on the City's policies and historic flood insurance claims.



Table 5-9: NFIP Status Table

NFIP and CRS Status & Information	
City of Suisun City	
NFIP Status	06/01/82
CRS Class	-
Policies in Force	317
Policies in SFHA	283
Policies in non-SFHA	34
Total Claims Paid	\$367,005
Paid Losses	61
Repetitive Loss Properties	3
Severe Repetitive Loss Properties	1
Repetitive Loss Payment by NFIP on Building	\$106,051
Repetitive Loss Payment by NFIP on Contents	\$20,945

Source: FEMA CIS 2021, OpenFEMA Data, FIMA RUL Solano County

Note: Policies and claims provided directly from FEMA Region IX CIS Report (8/2021). Repetitive loss tabulations by jurisdiction derived via GIS-based intersect of data available at OpenFEMA Data (<https://www.fema.gov/about/openfema/data-sets>). Countywide data reported for entire county area including municipalities. The Privacy Act of 1974 (5 U.S.C. 522a) restricts the release of certain types of data to the public. Flood insurance policy and claims data are included in the list of restricted information. FEMA can only release such data to state and local governments, and only if the data are used for floodplain management, mitigation, or research purposes. Therefore, this plan does not identify the repetitive loss properties or include claims data for any individual property.

See Volume 1, Section 4.5 for more information on the NFIP

5.4.3.4 Identify Hazard Problem Statements

As part of the mitigation action identification process, the Planning Committee for each jurisdiction identified areas of concern (aka problem statements) for their respective facilities based on the risk assessment and vulnerability analysis, utilizing the RAMP mapping and static snapshot maps. Problem statements focused on the impact, victim, or threat that the hazard could create in the jurisdiction, as described in Figure 5-15. Identifying common issues and weaknesses through these problem statements assisted the Planning Committee in understanding the realm of resources needed for mitigation. Jurisdiction problem statements are listed in Table 5-10.

The goal is to have at least one mitigation action for every problem statement. Projects or actions have been developed to mitigate each problem identified. See Table 5-15 for a full list of mitigation actions and corresponding problem statements that they address. Each problem statement is coded with a problem number for cross-referencing between Table 5-10 and Table 5-15.






 IMPACT	 VICTIM	 THREAT
<ul style="list-style-type: none"> Casualties Property Damage Business Interruption Financial Loss Environmental Contamination 	<ul style="list-style-type: none"> School Children in High Hazard Areas Care Facilities in High Hazard Areas Vulnerable Population Exposed to Hazards 	<ul style="list-style-type: none"> Increased Fuels due to Drought Hotter, Drier Climate More Intense Storms Impervious Surfaces = Greater Runoff Increases of Invasive Species

Figure 5-15: Guidance for Problem Statements

Table 5-10: Problem Statements

Problem No.	Hazard Type	Area of Concern	Mitigation Alternatives	Primary Agency	Problem Description	Related MA
ps-CC-SU-161	Climate Change	Impact	PPRO - Property Protection, PE&A - Public Education & Awareness, SP - Structural Projects	City of Suisun City	King tide events are causing worsened flooding events. Exposure to sea level rise, increased risk.	ma-CC-SU-127, ma-SR-SU-197
ps-WF-SU-162	Wildfire	Threat	PRV - Prevention, PE&A - Public Education & Awareness	City of Suisun City	The city canal system (for flooding) that runs through the jurisdiction, grows vegetation causing increased fire risk/fuel.	ma-WF-SU-135, ma-AH-SU-198
ps-WF-SU-163	Wildfire	Threat	PRV - Prevention, PE&A - Public Education & Awareness	City of Suisun City	The city railway that runs through the jurisdiction, grows vegetation causing increased fire risk/fuel.	ma-WF-SU-136, ma-WF-SU-135, ma-AH-SU-198
ps-EQ-SU-164	Earthquake	Impact	PRV - Prevention, PE&A - Public Education & Awareness, SP - Structural Projects	City of Suisun City	Old town was built on reclaimed marsh, provided the soil conditions, it is likely that old town will be subject to liquefaction.	ma-EQ-SU-128, ma-AH-SU-198
ps-EQ-SU-165	Earthquake	Impact	PRV - Prevention, PE&A - Public Education & Awareness, ES - Emergency Services	City of Suisun City	A split in the railway could impact egress throughout the jurisdiction.	ma-EQ-SU-184
ps-EQ-SU-166	Earthquake	Impact	PRV - Prevention, SP - Structural Projects	City of Suisun City	The fire station is susceptible to earthquake due to construction type and year built.	ma-EQ-SU-129



Problem No.	Hazard Type	Area of Concern	Mitigation Alternatives	Primary Agency	Problem Description	Related MA
ps-EQ-SU-167	Earthquake	Impact	PPRO - Property Protection, PE&A - Public Education & Awareness, SP - Structural Projects	City of Suisun City	Tsunami risk will be growing with sea level rise.	ma-EQ-SU-180
ps-FL-SU-168	Flood	Impact	PRV - Prevention, PE&A - Public Education & Awareness, SP - Structural Projects	City of Suisun City	Highway 12 suffers major impacts from large flood events.	ma-FL-SU-133
ps-FL-SU-169	Flood	Impact	PRV - Prevention, PPRO - Property Protection, PE&A - Public Education & Awareness	City of Suisun City	Old town is vulnerable to flooding and flood damage, especially during king tide events.	ma-FL-SU-134, ma-AH-SU-198
ps-EW-SU-170	Extreme Weather	Impact	PRV - Prevention, SP - Structural Projects	City of Suisun City	Storm water drains are in place under highway 12, one failed two years ago.	ma-EW-SU-130
ps-EW-SU-171	Extreme Weather	Impact	PRV - Prevention, PE&A - Public Education & Awareness, ES - Emergency Services	City of Suisun City	High wind events cause more consistent power outages.	ma-EW-SU-131, ma-EW-SU-132
ps-EW-SU-172	Extreme Weather	Impact	PRV - Prevention, PE&A - Public Education & Awareness, ES - Emergency Services	City of Suisun City	Need for more generators throughout the jurisdiction (EOC and suggested permanent solution to cooling centers).	ma-EW-SU-132

5.4.4 Mitigation Action Support Tool (MAST)

As a living document, hazard problem statements and mitigation activities will be updated through a web interface application developed specifically for participating jurisdictions. The Mitigation Action Support Tool (MAST) is accessible through mitigatehazards.com/SolanoHMP/.

MAST is a web-based interactive tool that enables multiple users to search, view, enter, and update mitigation actions, ideas or projects, and other information. MAST provides participating jurisdictions and plan reviewers (Cal OES/FEMA) access to valuable mitigation information that can be leveraged by future planning or other risk reduction efforts within the County. Participating jurisdictions can update the status of their mitigation projects throughout the planning lifecycle, and this web-based tool will improve participating jurisdiction’s ability to apply for FEMA’s Hazard Mitigation Assistance (HMA) grant programs including initial grant application processes through Cal OES.



5.5 Mitigation Strategy

The mitigation strategy is the guidebook to future hazard mitigation administration, capturing the key outcomes of the MJHMP planning process. The mitigation strategy is intended to reduce vulnerabilities outlined in the previous section (a.k.a. problem statements) with a prescription of policies and physical projects. These mitigation actions should be compatible with existing planning mechanisms and should outline specific roles and resources for implementation success.

5.5.1 Capabilities & Adaptive Capacity Assessment

This section examines the planning and regulatory, administrative, technical, financial, educational, and outreach capabilities to augment known issues and weaknesses from identified natural hazards.

Capabilities assessments in this Volume 1 and in Volume 2 include considerations of a community's adaptive capacity for climate change, as outlined in Cal OES' 2020 California Adaptation Planning Guide. Adaptive capacity is a community or region's existing ability to moderate climate change impacts. Assessing adaptive capacity includes analysis of policies, plans, programs, funding, and staffing capacity.

The tables in this section explore various local planning mechanisms, administrative capacity, financial capabilities, and education and outreach initiatives. The columns in each table represent deeper dives into the following questions:

- Is the existing planning or regulatory mechanism used currently? (Column 1, Status)
- Has the HMP been integrated into the planning mechanism currently so that the named mechanism is currently used in HMP planning? (Column 2, Current Mitigation Use)
- Is there a future opportunity to expand, improve upon, and incorporate this 2020 HMP Update into the planning or regulatory mechanism? (Column 3, Future Opportunity)

The capabilities assessment is easily digestible and based on color coding to indicate which policies and plans are adequate, need improvement or in which the HMP could be integrated. Each table includes a legend that explain how each one of these questions are being answered according to the color indicated: green, yellow, and orange.

For more information on the regulatory environment surrounding each hazard, see hazard-specific sections of Volume 1. Volume 1, Section 5.3.5 includes an extensive list of federal and state funding opportunities as well.



5.5.1.1 Planning and Regulatory Capabilities

Table 5-11: Planning and Regulatory Capabilities

CAPABILITY ASSESSMENT LEGEND		
Status	Current Mitigation Use	Future Opportunity
Currently in use or present.	Used widely for mitigation.	Opportunity to expand and integrate.
(Sort of) Seldomly used or limited presence.	Limited use in mitigation planning.	Limited opportunity to expand and integrate.
(No) Not present or available.	Not used in mitigation planning.	No opportunity to expand or integrate.

Resource	HMP Integration			Notes / Additional Detail
	Status	Current Mitigation Use	Future Opportunity	
Planning and Regulatory Capabilities				
Construction and Future Development Regulations				
Building Codes				2019 California Building Code
Building Code Effectiveness Grading Schedule (BCEGS) Rating	N/A	N/A	N/A	Unknown
Public Protection (ISO Class)				ISO Class up for review from the last 18 months, ISO 3
Hazard Related Development Standards				Light on hazard-related siting and requirements beyond building code
Hazard-Specific Ordinance				Basis for establishing the areas of special flood hazard (15.08), Seismic hazards identification program (15.60), Water efficient landscape (20.04)
Zoning Ordinance				Title 18 - Zoning, no hazard related zones
Growth Management Ordinance			N/A	
Hazard Reduction Programs (Annually Conducted)				
Capital Improvements Program (CIP) or Plan				Opportunity to integrate hazard planning and funding needs into CIP
Erosion/Sediment Control Program				Erosion Control Standards 15.12 - Article III
Hazard-Related Public Outreach Program				See Education & Outreach Capabilities for more specifics.



Resource	HMP Integration			Notes / Additional Detail
	Status	Current Mitigation Use	Future Opportunity	
Planning and Regulatory Capabilities				
Stormwater Management Program (Annual Inspections)	Green	Green	Green	The Suisun City Public Works Department participates in efforts to control the amount and quality of storm water running off hard scape surfaces in the City. https://www.suisun.com/departments/public-works/stormwater-programs/
Seismic Safety Program (Non-structural Inspections)	Green	Yellow	Yellow	Seismic hazards identification program (15.60)
Earthquake Modernization Program (Building Safety Inspections)	Green	Yellow	Yellow	
Hazard Plans				
General Plan Safety Element	Green	Green	Yellow	Safety (Chapter 9); 2015
Noteworthy Area/ Specific Plan with Hazard Focus	Green	Green	Yellow	Waterfront District Specific Plan (2016)
Community Wildfire Protection Plan (CWPP)	N/A	N/A	N/A	
Wildfire Vulnerability Assessment	Orange	Orange	Green	
Urban or Integrated Regional Water Management Plan	Green	Yellow	Yellow	2015 Solano County Water Agency urban water management plan: https://www.scwa2.com/documents/publications/2015%20SCWA%20UWMP.pdf
Floodplain Management Plan	Orange	Green	Green	Solano Flood Resiliency Plan underway (2021-2022)
Stormwater Management Plan	Green	Yellow	Yellow	The Suisun City Public Works Department participates in efforts to control the amount and quality of storm water running off hard scape surfaces in the City. https://www.suisun.com/departments/public-works/stormwater-programs/
Ground Water Management Plan(s)	Orange	Orange	Green	Solano County GSP underway
Open Space and Land Management Plan(s)	Green	Green	Yellow	Suisun City General Plan Chapter 7 - Open space and Conservation
Emergency Operations Plan	Green	Yellow	Green	2017 Solano County Emergency Operations Plan
Climate Action Plan, Vulnerability Ass'mt, or Adaptation Plan	Green	Yellow	Green	2011 County of Solano Climate Action Plan
Sustainable Community Plan (SB 375)	Green	Yellow	Green	ABAG Plan Bay Area 2040 (2017)



Resource	HMP Integration			Notes / Additional Detail
	Status	Current Mitigation Use	Future Opportunity	
Planning and Regulatory Capabilities				
Local Delta/ Wetlands Program(s)	Green	Yellow	Orange	Suisun Marsh Protection Plan: https://www.scwa2.com/groundwater/sgma/ The Delta Plan https://www.deltacouncil.ca.gov/delta-plan/
Downtown Plan with hazard focus	Green	Green	Yellow	Waterfront District Specific Plan (2016)
Community Health Assessment(s)	Green	Green	Green	2016 Solano County Community Health Assessment https://www.solanocounty.com/civicax/filebank/blobdload.aspx?BlobID=27541
National Flood Protection Program (NFIP)				
Floodplain Management Regulations	Green	Green	Green	Basis for establishing the areas of special flood hazard (15.08), Seismic hazards identification program (15.60), Water efficient landscape (20.04)
Flood Insurance Education and Technical Assist.	Yellow	Yellow	Yellow	
Flood Hazard Mapping / Re-Mapping	Green	Yellow	Yellow	2013 Flood Insurance Study
Community Rating System (CRS)	Orange	Orange	Green	



5.5.1.2 Administrative and Technical Capabilities

Table 5-12: Administrative and Technical Capabilities

CAPABILITY ASSESSMENT LEGEND		
Status	Current Mitigation Use	Future Opportunity
Currently in use or present.	Used widely for mitigation.	Opportunity to expand and integrate.
(Sort of) Seldomly used or limited presence.	Limited use in mitigation planning.	Limited opportunity to expand and integrate.
(No) Not present or available.	Not used in mitigation planning.	No opportunity to expand or integrate.

Resource	HMP Integration			Notes / Additional Detail
	Status	Current Mitigation Use	Future Opportunity	
Administrative and Technical				
Community Planning and Development Services				
Community Planner				No hazard mitigation additional staffing is identified; staff will continue to integrate hazard mitigation into various roles.
Civil Engineer				
Building Code Official				
Floodplain Administrator				
Fire Marshall				
Dedicated Public Outreach Personnel				
GIS Specialist and Capability				
Emergency Manager				Fire Marshal
Grant Manager, Writer, or Specialist				Shared responsibilities
Other				
Warning Systems/Services				
General				AlertSolano
Flood				AlertSolano Flood Risk: California Department of Water Resources Flood Risk Notification Program Flood Control: Solano County Water Agency
Wildfire				AlertSolano
Geological Hazards				AlertSolano ShakeAlert.org (nation-wide)



5.5.1.3 Financial Capabilities

Table 5-13: Financial Capabilities

CAPABILITY ASSESSMENT LEGEND		
Status	Current Mitigation Use	Future Opportunity
Currently in use or present.	Used widely for mitigation.	Opportunity to expand and integrate.
(Sort of) Seldomly used or limited presence.	Limited use in mitigation planning.	Limited opportunity to expand and integrate.
(No) Not present or available.	Not used in mitigation planning.	No opportunity to expand or integrate.

Resource	HMP Integration			Notes / Additional Detail
	Status	Current Mitigation Use	Future Opportunity	
Fiscal Capabilities				
Financial Resources for Hazard Mitigation				
Levy for Specific Purposes with Voter Approval				While the City has employed these various financial capabilities to varying degrees, there are no examples of employing them for hazard mitigation projects or planning. However, it's not anticipated that many of these would be used to fund hazard mitigation projects in the future, either, unless paired with other grant funding.
Utilities Fees				
Benefit assessments				
System Development Fee				
Various Bonds to Incur Debt				
Withheld Spending in Hazard-Prone Areas	N/A	N/A	N/A	
Stormwater Service Fees				
Capital Improvement Project Funding				



5.5.1.4 Education and Outreach

Table 5-14: Education and Outreach Capabilities

CAPABILITY ASSESSMENT LEGEND		
Status	Current Mitigation Use	Future Opportunity
Currently in use or present.	Used widely for mitigation.	Opportunity to expand and integrate.
(Sort of) Seldomly used or limited presence.	Limited use in mitigation planning.	Limited opportunity to expand and integrate.
(No) Not present or available.	Not used in mitigation planning.	No opportunity to expand or integrate.

Resource	HMP Integration			Notes / Additional Detail
	Status	Current Mitigation Use	Future Opportunity	
Education / Outreach Capabilities				
Education/Outreach Resources				
Website Dedicated to Hazard Topics				Emergency Preparedness page on City website.
Dedicated Social Media				
Hazard Info. Avail. at Library/ Planning Desk				
Annual Public Safety Events				
Ability to Field Public Tech. Assistance Requests				
Public Safety Newsletters or Printed Outreach				
Fire Safe Councils	N/A	N/A	N/A	
Resource Conservation Districts				Solano Resource Conservation District
Other				

5.5.1.5 Capability and Adaptive Capacity Opportunities

The City of Suisun City identified many opportunities for strengthening community capabilities and adaptive capacity. The City considered this assessment in developing its Mitigation Strategy. The City identified additional staffing, typical of a smaller jurisdiction. Notably, the City is updating several planning documents that will improve planning and regulatory capacity. The City also had good capacity under its current planning documentation and is developing a new Flood Resiliency Plan as well.

Volume 1, Section 5.3.5 includes an extensive list of federal and state funding opportunities to leverage to improve community capabilities.



5.5.2 Mitigation Actions

Mitigation actions were developed based upon the jurisdiction’s priorities, risk assessment results, and mitigation alternatives. The mitigation action prioritization method used by all participating jurisdictions is described in Section 5.5.1 of Volume 1. Table 5-15 lists each priority mitigation action, responsible party, time frame, potential funding source, implementation steps, and resources need to implement based upon the Planning Committee consensus.

Each participating jurisdiction, including the City of Suisun City, considered ongoing relevancy of mitigation actions from the existing MJHMP and retained or removed such actions while adding new relevant actions as well. Mitigation actions were examined for relevancy and the potential for future implementation and then evaluated for potential follow-up. Some mitigation actions developed during the previous HMP effort were not included because they were an inherent part of the HMP update process or were not detailed enough for implementation at a local jurisdiction level. The City of Suisun City has made significant changes to other mitigation actions because of the updated risk assessment and implementation strategy, to include more detail, or to update based on current mitigation practices. Volume 1, Section 5.5.2 provides a record of County wide mitigation actions, the status, and additional notes for each action.

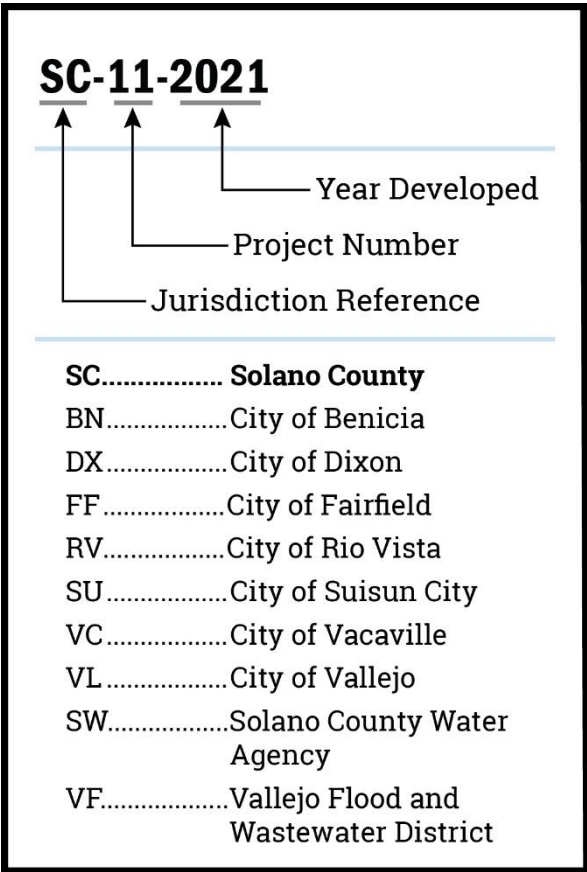


Figure 5-16: Mitigation Action Key

Table 5-15 lists each mitigation action for the City of Suisun City. Each participating jurisdiction developed unique mitigation actions, targeted at their own unique priorities and vulnerabilities. Each mitigation action identifies the responsible party, time frame, potential funding source, implementation steps and resources needed to implement these priority mitigation actions. As a living document, hazard problem statements and mitigation activities will be updated through MAST. The detail in Table 5-15 meets the regulatory requirements of FEMA and DMA 2000.

Table 5-15: City of Suisun City Mitigation Actions

Mitigation No.	Hazard Type	Mitigation Type	Status	Year	Primary Agency	Title/Description	Responsible Party	Estimated Cost	Estimated Benefit	Time Frame	HMA Activity Type	Potential Grant Source	Priority	Related Goal(s)	Related Problem Statements
ma-SR-SU-197	All Hazard	PRV - Prevention , PE&A - Public Education & Awareness , SP - Structural Projects	Ongoing	2018	City of Suisun City	Review zoning and development standards for opportunities to strengthen, especially in areas susceptible to sea level rise, and update as necessary.	Development Services	Medium - The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.	Medium - Project will have a long-term impact on the reduction of risk exposure for life and property, or project will not provide an immediate reduction in the risk exposure for property.	1-3 Years	Planning	HMGP / BRIC , FMA , Internal Funding	Medium	Goal 4: Resilience	ps-CC-SU-161
ma-AH-SU-198	All Hazard	PE&A - Public Education & Awareness	Ongoing	2018	City of Suisun City	Encourage the public to prepare for disasters by developing personal emergency response plans and by maintaining a 3-day preparedness kit for home and work. Do this through community forums, presentations and media.	City of Suisun City	Low - The project could be funded under the existing budget. The project is part of or can be part of an ongoing existing program.	Medium - Project will have a long-term impact on the reduction of risk exposure for life and property, or project will not provide an immediate reduction in the risk exposure for property.	1-3 Years	5%	HMGP / BRIC , EMPG , Internal Funding	Medium	Goal 1: People , Goal 4: Resilience	ps-WF-SU-162, ps-WF-SU-163, ps-EQ-SU-164, ps-FL-SU-169
ma-CC-SU-127	Climate Change	PRV - Prevention	Pending	2021	City of Suisun City	Implement specific actions identified in the the City Flood and Sea Level Rise Resiliency Plan, underway in 2021.	City of Suisun City	Medium - The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.	High - Project will provide an immediate reduction of risk exposure for life and property.	3-5 Years	Project	HMGP / BRIC , FMA , Internal Funding	High	Goal 4: Resilience	ps-CC-SU-161
ma-EQ-SU-180	Climate Change	SP - Structural Projects	Pending	2021	City of Suisun City	Improve marina facilities to withstand king tide events and sea level rise.	City Public Works & Engineering	High - Existing funding will not cover the cost of the project; implementation would require new revenue through an alternative source (for example, bonds, grants, and fee increases).	High - Project will provide an immediate reduction of risk exposure for life and property.	5-10 Years	Project	HMGP / BRIC , FMA	Medium	Goal 2: Infrastructure	ps-EQ-SU-167
ma-EQ-SU-128	Earthquake	PRV - Prevention	Pending	2021	City of Suisun City	Conduct Public Education campaign(s) on earthquake preparedness and liquefaction.	City of Suisun City	Low - The project could be funded under the existing budget. The project is part of or can be part of an ongoing existing program.	Medium - Project will have a long-term impact on the reduction of risk exposure for life and property, or project will not provide an immediate reduction in the risk exposure for property.	1-3 Years	5%	EMPG , Internal Funding	High	Goal 1: People , Goal 4: Resilience	ps-EQ-SU-164
ma-EQ-SU-129	Earthquake	SP - Structural Projects	Pending	2021	City of Suisun City	Retrofit or replace un-reinforced masonry Fire Station.	Fire Department	High - Existing funding will not cover the cost of the project; implementation would require new revenue through an alternative source (for example, bonds, grants, and fee increases).	High - Project will provide an immediate reduction of risk exposure for life and property.	3-5 Years	Project	HMGP / BRIC , Internal Funding	High	Goal 1: People , Goal 2: Infrastructure , Goal 4: Resilience	ps-EQ-SU-166

Mitigation No.	Hazard Type	Mitigation Type	Status	Year	Primary Agency	Title/Description	Responsible Party	Estimated Cost	Estimated Benefit	Time Frame	HMA Activity Type	Potential Grant Source	Priority	Related Goal(s)	Related Problem Statements
ma-EQ-SU-184	Earthquake	ES - Emergency Services	Pending	2021	City of Suisun City	Develop an assessment plan to determine railway points of vulnerability to more accurately predict areas of which would be impacted most during railway damage events. The plan can include preparedness plans to quickly initiate detours to maintain a secondary access point to the interstate and operations to activate.	Fire Department	Low - The project could be funded under the existing budget. The project is part of or can be part of an ongoing existing program.	Medium - Project will have a long-term impact on the reduction of risk exposure for life and property, or project will not provide an immediate reduction in the risk exposure for property.	1-3 Years	N/A	EMPG , Internal Funding	High	Goal 2: Infrastructure , Goal 4: Resilience	ps-EQ-SU-165
ma-EW-SU-130	Extreme Weather	PRV - Prevention	Pending	2021	City of Suisun City	Reinforce the city's storm water drains systems to enhance the survivability of the systems during heavy rain event, which are compounded by high wind events creating debris, and other flooding incidents.	City Public Works & Engineering	High - Existing funding will not cover the cost of the project; implementation would require new revenue through an alternative source (for example, bonds, grants, and fee increases).	High - Project will provide an immediate reduction of risk exposure for life and property.	5-10 Years	Project	HMGP / BRIC , FMA , Internal Funding	High	Goal 2: Infrastructure	ps-EW-SU-170
ma-EW-SU-132	Extreme Weather	ES - Emergency Services	Pending	2021	City of Suisun City	Install backup power generators to support operation of critical facilities, including water and wastewater systems, emergency services, and cooling and heating centers.	Fire Department	Medium - The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.	Medium - Project will have a long-term impact on the reduction of risk exposure for life and property, or project will not provide an immediate reduction in the risk exposure for property.	3-5 Years	5%	EMPG , Internal Funding	High	Goal 2: Infrastructure , Goal 4: Resilience	ps-EW-SU-172, ps-EW-SU-171
ma-FL-SU-133	Flood	SP - Structural Projects	Pending	2021	City of Suisun City	Reinforce highway 12 drainage systems from flooding through protection activities, including elevating the highway, installing culverts beneath roads or building a higher bridge across areas that experiences regular flooding.	City Public Works & Engineering	High - Existing funding will not cover the cost of the project; implementation would require new revenue through an alternative source (for example, bonds, grants, and fee increases).	High - Project will provide an immediate reduction of risk exposure for life and property.	5-10 Years	Project	HMGP / BRIC , Internal Funding	High	Goal 2: Infrastructure	ps-FL-SU-168
ma-FL-SU-134	Flood	SP - Structural Projects	Pending	2021	City of Suisun City	Reinforce local ramps, bridges, and roads from flooding through protection activities, including elevating road(s) and installing culverts beneath roads or building a higher bridge across areas that experiences regular flooding.	City Public Works & Engineering	High - Existing funding will not cover the cost of the project; implementation would require new revenue through an alternative source (for example, bonds, grants, and fee increases).	High - Project will provide an immediate reduction of risk exposure for life and property.	5-10 Years	Project	HMGP / BRIC , FMA , Internal Funding	Medium	Goal 2: Infrastructure	ps-FL-SU-169

Mitigation No.	Hazard Type	Mitigation Type	Status	Year	Primary Agency	Title/Description	Responsible Party	Estimated Cost	Estimated Benefit	Time Frame	HMA Activity Type	Potential Grant Source	Priority	Related Goal(s)	Related Problem Statements
ma-FL-SU-200	Flood	PE&A - Public Education & Awareness	Pending	2021	City of Suisun City	Explore benefits for City and residents for participation in the Community Rating System (CRS) for reduced flood insurance under the National Flood Insurance Program.	City of Suisun City	Low - The project could be funded under the existing budget. The project is part of or can be part of an ongoing existing program.	Medium - Project will have a long-term impact on the reduction of risk exposure for life and property, or project will not provide an immediate reduction in the risk exposure for property.	1-3 Years	5%	FMA , EMPG , Internal Funding	Medium	Goal 4: Resilience	ps-FL-SU-169
ma-WF-SU-135	Wildfire	PRV - Prevention	Ongoing	2021	City of Suisun City	Develop a wildfire mitigation plan to identify specific projects the City may wish to undertake related to wildfire	Fire Department	Low - The project could be funded under the existing budget. The project is part of or can be part of an ongoing existing program.	Medium - Project will have a long-term impact on the reduction of risk exposure for life and property, or project will not provide an immediate reduction in the risk exposure for property.	1-3 Years	N/A	FP&S , Internal Funding	High	Goal 4: Resilience	ps-WF-SU-162, ps-WF-SU-163



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SECTION 6

JURISDICTIONAL ANNEX:

City of Vacaville



SOLANO COUNTY

MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

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Solano County

Multi-Jurisdiction Hazard Mitigation Plan

CITY OF VACAVILLE (VC.)

Municipal Annex

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Adoption Resolution

To comply with DMA 2000, the City of Vacaville has officially adopted this Solano County Multi-Jurisdictional Hazard Mitigation Plan (MJHMP), Volume 1, and its jurisdictional annex. The adoption of the MJHMP recognizes the City’s commitment to reducing the impacts of natural hazards. See included adoption resolution.

RESOLUTION NO. 2022-050

**RESOLUTION OF THE CITY COUNCIL OF THE CITY OF VACAVILLE ADOPTING THE
UPDATED SOLANO COUNTY MULTI-JURISDICTION HAZARD MITIGATION PLAN FOR
THE CITY OF VACAVILLE**

WHEREAS,

(a) The City of Vacaville, a political subdivision of the State of California, is an official participating jurisdiction in the updated Solano Multi-Jurisdiction Hazard Mitigation Plan (“MJHMP”); and

(b) City of Vacaville recognizes the updated MJHMP as the official hazard mitigation plan for participating jurisdictions; and

(c) City of Vacaville has gathered information and prepared the updated MJHMP in accordance with Federal Emergency Management Agency (FEMA) requirements at 44 CFR § 201.6; and

(d) Volume 1 of the updated MJHMP recognizes the threat that natural hazards pose to people and property Solano County-wide; and

(e) City of Vacaville’s Annex to Volume 1 of the updated MJHMP provides additional information specific to the City of Vacaville, with a focus on providing additional details on the planning process, risk assessment, and mitigation strategy for this community; and

(f) City of Vacaville has reviewed Volume 1 of the updated MJHMP and its Annex and affirms that the plan actions in Volume 1 and its Annex should reduce the potential for harm to people and property from future hazard occurrences within the community; and

(g) The U. S. Congress passed the Disaster Mitigation Act of 2000 (“Disaster Mitigation Act”) emphasizing the need for pre-disaster mitigation of potential hazards; and

(h) The Disaster Mitigation Act made available mitigation grants to state and local governments; and

(i) An adopted hazard mitigation plan is required as a condition of future funding for mitigation projects under multiple FEMA pre- and post-disaster mitigation grant programs; and

(j) The City of Vacaville fully participated in the FEMA-prescribed mitigation planning process to prepare this updated MJHMP; and

(k) The residents were afforded opportunities to comment and provide input in the updated MJHMP and the mitigation actions in the Plan; and

(l) The City of Vacaville, as a fully participating jurisdiction of the updated MJHMP, is an eligible sub-applicant to the State of California under FEMA’s hazard mitigation grant program guidance; and

(m) The California Office of Emergency Services (Cal OES), and the FEMA Region IX officials have reviewed the updated MJHMP, and approved it contingent upon this official adoption by the participating governing body; and

(n) The City of Vacaville desires to comply with the requirements of the Disaster Mitigation Act and to augment its emergency planning efforts by formally adopting the updated MJHMP; and

(o) Adoption by the City Council for the City of Vacaville demonstrates the jurisdiction's commitment to fulfilling the mitigation goals and objectives outlined in this updated MJHMP; and

(p) Adoption of this plan helps to coordinate the responsible agencies to carry out their responsibilities under the updated MJHMP.

NOW, THEREFORE, BE IT RESOLVED by the City Council of the City of Vacaville:

1. This City Council finds the facts mentioned above to be true and further finds that this City Council has jurisdiction to consider, approve, and adopt the subject of this Resolution.
2. This City Council does hereby adopt the updated Solano County Multi-Jurisdiction Hazard Mitigation Plan Volume 1 and its Annex, as approved by FEMA and Cal OES, as the official mitigation plan for City of Vacaville.
3. This City Council authorizes the Solano County Emergency Services Manager to submit an approved and signed copy of this adoption resolution to the California Office of Emergency Services and FEMA Region IX officials to enable the plan's final approval in accordance with the requirements of the Disaster Mitigation Act of 2000.

I HEREBY CERTIFY that the foregoing resolution was introduced and passed at a regular meeting of the City Council of the City of Vacaville, held on the 14th day of June 2022, by the following vote:

AYES: Councilmembers Ritchie, Silva, Stockton, Sullivan, Wylie, Vice Mayor Roberts and Mayor Rowlett

NOES: None

ABSENT: None

ATTEST:


Michelle A. Thornbrugh, City Clerk



Section 6. City of Vacaville

6.1 Purpose

This Annex details the hazard mitigation planning elements specific to the City of Vacaville. This Annex is not intended to be a standalone document but appends to and supplements the information contained in the umbrella plan document. As such, all sections of the umbrella plan, including the planning process and other procedural requirements apply to and were met by the City of Vacaville. This Annex provides additional information specific to the City of Vacaville, with a focus on providing additional details on the planning process, risk assessment, and mitigation strategy for this community.

Hazard Mitigation Plan Points of Contact

Primary Point of Contact

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Alternate Point of Contact

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6.2 Planning Methodology

The City of Vacaville followed the planning process detailed in Volume 1, Section 3, including participating in the County Hazard Mitigation Planning Committee (HMPC) and Steering Committee and formulating their own internal planning team to support the broader planning process. Internal planning participants, their positions, and how they participated in the planning process are shown in Table 6-1.

Table 6-1: Planning Committee Members

Planning Committee Members	Title	Department
Kris Concepcion	Chief	Fire Department
Alex Nourot	Deputy Chief	Fire Department
Tim Burke	Assistant Director/ City Engineer	Public Works
Fred Buderl	Director	Community Development
Reggie Hubbard	Recreation Manager	Parks and Recreation
Aaron Busch	City Manager	City of Vacaville
Jay Salazar	Chief Building Official	Community Development Department
Girum Awoke	Director	Public Works
Brian McLean	Deputy Director	Public Works
Jill Childers	Manager	Fire Prevention Bureau
Curt Corbett	GIS Coordinator	Information Technology Department
Justen Cole	Assistant Director	Utilities
Ian Schmutzler	Captain	Police Department

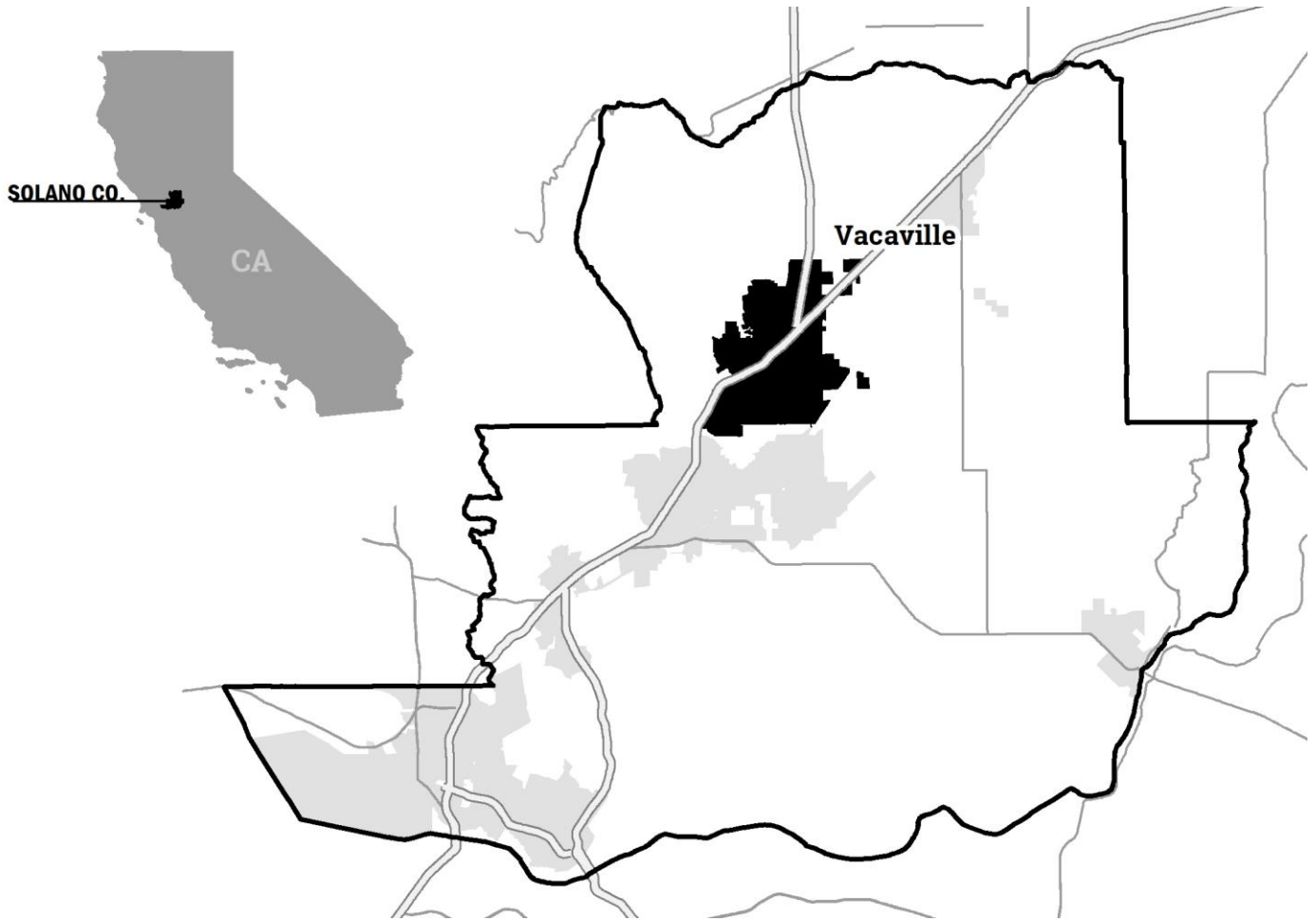


Figure 6-1: City of Vacaville Location



6.3 What's New

The City of Vacaville has been making improvements toward reducing natural hazard risks to life and property since the existing MJHMP was adopted.

The City reevaluated previous mitigation actions. Some mitigation actions have been completed and are highlighted in Table 6-3. The City determined to cancel one due to reprioritization. Table 6-2 lists the cancelled mitigation action along with an explanation for why. Other mitigation actions are pending or ongoing and are included in Table 6-17.

Table 6-2: Cancelled Mitigation Actions

Mitigation No.	Hazard Type	Status	Year	Primary Agency	Title/Description	Responsible Party	Reason Cancelled
ma-FL-VC-45	Flood	Cancelled	2017	City of Vacaville	Develop ordinance for new development code enforcement for alterations and additions.	Public Works Community Development	No longer a priority for City

6.3.1 Mitigation Successes

The following describes the City's mitigation success stories, and Table 6-3 shows two completed mitigation actions from the City's 2017 HMP.

Table 6-3: Completed Mitigation Actions

Mitigation No.	Hazard Type	Status	Year	Primary Agency	Title/Description	Responsible Party
ma-DF-VC-59	Dam Failure	Completed	2017	City of Vacaville	Determine inundation zones and develop an emergency action plan for each dam within the City of Vacaville.	Public Works; Admin
ma-FL-VC-43	Flood	Completed	2017	City of Vacaville	Provide alert and notification to residents for flood risk	PIO Fire Dept.



Weed Abatement Successes During LNU Lightning Complex Fires: The City recently faced catastrophic wildfires, most recently the LNU Lightning Complex of August 2020. The City has several success stories in reflecting on “what worked” to protect the City during wildfire events. Several mitigation actions are aimed at what was identified as future needs from that same wildfire event. Successes include:

- **Ordinance.** The City’s weed abatement ordinance is stronger than state standards, and the stricter standards meant significant fuel reduction and less wildfire impacts as a result.
- **Code Enforcement.** The City also focuses on weed abatement in enforcement, with more than half of its code compliance actions in 2019 focused on weed abatement violations.
- **Grazing.** The City has used cow grazing to reduce weeds and other fuels to mitigate wildfire impacts. Cow grazing significantly slowed the forward movement of the LNU Lightning Complex fire as it spread into the city and allowed for successful containment efforts without the loss of homes within the city limits. The City would like to expand the use of grazing efforts particularly to include goat and sheep grazing as they are more effective than cows in some areas.
- **City Weed Abatement Program.** The City annually manages a rigorous weed abatement program performed by both in-house City staff and managed contractors to abate the over 2,000 acres of designated weed abatement parcels. See Figure 1-2.



Figure 6-2: Weed Abatement Success! Wildfires stopped at fire break and weed abatement.



Flood Mitigation Detention Basin Complete.

The City completed the Rancho Rogelio Detention Basin Project (Proj. #23 in General Plan and 2017 HMP), which will increase flood resiliency in the area. See Figure 1-3.

Progress on development of reclaimed water system. The City continues to make progress on its 2017 mitigation action to implement a reclaimed water system. Since 2017, the City completed assessments and drafted a preliminary infrastructure system. The City Council adopted its Recycled Water Master Plan in April of 2021.



Figure 6-3: Rancho Rogelio Detention Basin during a storm.

6.4 Risk Assessment

The intent of this section is to profile the City of Vacaville's hazards and assess the City's vulnerabilities, distinct from that of the County wide planning area. The hazard profiles in Volume 1 discuss overall impacts to the planning area and describes the hazard problem description, hazard extent, magnitude/severity, previous occurrences of hazard events and the likelihood of future occurrences. For more information on Risk Assessment Methodologies, see Vol. 1 and Appendix A.

6.4.1 Hazard Screening Criteria

Planning Team members from each participating jurisdiction collectively discussed which hazards should be profiled in the Plan and which should not. The results of that discussion can be found in Table 6-4. Detailed hazard profiles of the most significant County wide hazards are described in Section 4 of Volume 1. The Planning Team reviewed previously-prepared hazard mitigation plans and other relevant documents to determine the realm of natural hazards that have the potential to affect the City of Vacaville. Table 6-5 provides a crosswalk of hazards identified in Vol. 1 of this plan, the City of Vacaville General Plan, and 2018 California State Hazard Mitigation Plan. The crosswalk was used to develop a preliminary hazards list, providing a framework for the Planning Team members to evaluate which hazards were truly relevant to the City of Vacaville and which ones were not. Section 6.4.2 below describes the hazard risk ranking process that was performed by the planning team which prioritized hazards that are specifically relevant to the City of Vacaville.



Table 6-4: County-Wide Hazard Prioritization

Hazard Type	Explanation
Climate Change	High priority county-wide, profiled hazard.
Dam/ Levee failure	Dam failure is possible in Solano County but is best addressed in other plans, specifically Emergency Action Plans for high hazard dams affecting Solano County.
Drought	High priority county-wide, profiled hazard.
Earthquake/ Geologic Hazards	High priority county-wide, profiled hazard.
Flood	High priority county-wide, profiled hazard.
Hazardous Material	While hazardous materials can release and impact the County, there are better avenues to address this hazard outside this plan.
High Winds/ Straight Line Winds	High priority county-wide, profiled as part of Extreme Weather.
Insect Hazards	While hazardous insects exist in Solano County, this was not considered a priority and is not profiled in this plan.
Pandemic Disease	While pandemic disease can impact the County, there are better avenues to address this hazard outside this plan.
Extreme Weather, including:	High priority county-wide for high wind, heavy rain, and high heat.
Extreme Heat	Profiled as part of Extreme Weather.
Hail	Hail events are rare and not considered a priority.
High Wind	Profiled as part of Extreme Weather.
Heavy Rain	Profiled as part of Extreme Weather.
Fog	Fog events are rare and are not considered a priority.
Lightning	Not a priority as an extreme weather event; discussed as source of wildfire.
Severe Thunderstorm	Severe thunderstorms were not identified as a priority in this plan.
Winter Storm / Extreme Cold/ Freeze Events	Winter storms are rare in Solano County and not identified as a priority for this plan.
Slope Failure	High priority county-wide, profiled hazard.
Soil Hazards	While limited soil hazards exist in Solano County (erosion and shifting soils), these are not prioritized in this plan. Erosion discussed under flood hazard.
Terrorism/Human Caused Threats	While terrorism is certainly a threat to the County and participating jurisdictions, it is best addressed in other plans as this HMP does not address human-caused threats.
Tornado	Impacts to the County from tornados are extremely unlikely, if any.
Volcanic Activity	Due to distance from volcanoes and the limited chance of an eruption, this hazard was not identified as a priority.
Wildfire	High priority county-wide, profiled hazard.



Table 6-5: City Document Review Crosswalk

Hazards	2015 Vacaville General Plan	2017 Vacaville HMP	2014 Solano County HMP	2018 California State HMP
Agricultural Pests				■
Climate Change	■	■	■	■
Dam Failure	■	■	■	■
Drought		■	■	■
Earthquake	■	■	■	■
Extreme Weather		■	■	■
Flood	■	■	■	■
Landslide	■	■	■	■
Levee Failure				■
Manmade Hazards	■			■
Pandemic Disease				■
Sea Level Rise			■	■
Soil Hazards	■			■
Terrorism & Tech Hazards				■
Tsunami				■
Volcano				■
Wildfire	■	■	■	■

6.4.2 Hazard Risk Ranking

The City of Vacaville’s Planning Team used the same hazard prioritization process as the Solano County Hazard Mitigation Planning Committee. This process is described in detail in Section 4.3.1 of Vol. 1. Figure 6-4 displays the results of the hazard risk ranking exercise that was performed by the Planning Team. The Planning Team chose to assess the City of Vacaville’s vulnerability to the following hazards:

- Wildfire
 - Earthquake
 - Drought
 - Climate Change
 - Flood
 - Extreme Weather
 - Slope Failure
- (heavy rain, high wind, high heat)

All of these hazards have been profiled in Vol. 1 of this document. The purpose of this annex to specifically address the City of Vacaville’s vulnerability to these specifically-identified hazards.

6.4.3 Vulnerability Assessment

Assessing vulnerabilities exposes the unique characteristics of individual hazards and begins the process of narrowing down which areas within the City of Vacaville are vulnerable to specific hazard events. The vulnerability assessment considered unique local knowledge of hazards and impacts and a GIS overlaying method for examining such vulnerabilities more in depth. Using these methods, participating jurisdictions estimated vulnerable populations, infrastructure, and potential losses from hazards.



6.4.3.1 Risk Assessment

Each participating jurisdiction developed a risk matrix that assessed the probability and impact of various hazards within the jurisdiction. Figure 6-4 is the jurisdiction's risk assessment, which was completed in part using the web based and interactive Risk Assessment Mapping Platform (RAMP), accessed via the project website at www.mitigatehazards.com. RAMP allows interactive discovery of robust risk, vulnerability, and exposure data developed especially for Solano County. RAMP is a mapping platform built specifically for mitigation planning. It displays County/jurisdiction facilities and buildings overlaid with natural hazards layers to bring interactivity and individual discovery to the GIS analysis performed for the MJHMP. See Vol. 1 for a detailed description of RAMP. The Planning Team used RAMP in meetings and as needed to understand vulnerabilities to the City of Vacaville. Users interactively filter facilities and buildings by natural hazard zones and/or construction characteristics. The City of Vacaville also conducted a more detailed climate vulnerability assessment, included as Appendix A to this annex. The climate vulnerability assessment analyzed climate-related vulnerabilities by considering the impact from the climate vulnerability and the community's adaptive capacity to respond to the particular vulnerability.

6.4.3.2 Snapshot Exposure Maps and Damage Estimation

The included snapshot maps and damage estimation tables illustrate the City of Vacaville's vulnerability to specific hazards. Based on the risk assessment, the snapshot maps focus on those hazards prioritized by the jurisdiction. These maps helped the Planning Team understand the exposure of population, parcels, and critical infrastructure to specific hazards. Each map contains an exposure summary that displays the percent of the population, the improvement and content value of parcels, and the amount of critical infrastructure that is exposed to each respective hazard. For flood and earthquake, detailed damage estimations were conducted through FEMA's Hazus software and are shown in tabular form. Additional mapping is also included. Figures and tables include:

- Figure 6-5: City of Vacaville - Mean Fire Return Interval
- Figure 6-6: City of Vacaville – Wildfire Risk Exposure
- Figure 6-7: City of Vacaville – FEMA Flood Risk Exposure
- Table 6-6: City of Vacaville - Damage Estimate Summaries, 100YR Flood
- Table 6-7: City of Vacaville - Damage Estimate Summaries, 500YR Flood
- Figure 6-8: City of Vacaville – BAM 200-YR Flooding and Awareness Zones
- Figure 6-9: City of Vacaville – Concord Green Valley EQ Scenario (M6.8)
- Table 6-8: City of Vacaville Concord Green Valley Damage Estimate Summary
- Figure 6-10: City of Vacaville – Hayward Rodger's Creek EQ Scenario (M7.1)
- Table 6-9: City of Vacaville - Hayward Rodger's Creek Damage Estimate Summary
- Figure 6-11: City of Vacaville – Areas with Potential for Liquefaction
- Figure 6-12: City of Vacaville – 30-YR Normal Maximum Temperature for July
- Figure 6-13: City of Vacaville – Average Annual Precipitation (1981-2012. Inches)
- Figure 6-14: City of Vacaville – Annual Average Wind Speed (Power Class)
- Figure 6-15: City of Vacaville– Drought Severity Timeline for Lower Sacramento Watershed
- Figure 6-16: City of Vacaville – Landslide Risk Exposure
- Figure 6-17: City of Vacaville– RCP Comparison



Risk Assessment Matrix Definitions

PROBABILITY RATING

The likelihood of a hazard event occurring within a time period?

PROBABILITY	Highly Likely	Highly likely - 100% annual probability. Or likely to occur every year in your lifetime.
	Likely	Likely - Between 10 and 100% annual probability. Or will occur several times in your lifetime.
	Possible	Possible - Between 1 and 10% annual probability. Or likely to occur some time in your lifetime.
	Unlikely	Unlikely - Less than 1% annual probability. Or unlikely but possible to occur in your lifetime.

IMPACT RATING

In terms of injuries, damage, or death, would you anticipate impacts to be minor, limited, critical, or catastrophic when a significant hazard event occurs? The impact could be in terms of one hazard event (flooding from a culvert failure) or a large-scale event (multiple rivers flooding) in the same jurisdictional boundary.

IMPACT			
Minor	Limited	Critical	Catastrophic
Minor - Very few injuries, if any. Only minor property damage and minimal disruption on quality of life. Temporary shutdown of critical facilities.	Limited - Minor injuries only. Approx. 10% or less of property in disaster footprint damaged or destroyed. Complete shutdown of critical facilities for more than one day.	Critical - Multiple deaths/injuries possible. Between 25% and 50% of property in disaster footprint is damaged or destroyed. Complete shutdown of critical facilities for more than one week.	Catastrophic - High number of deaths/injuries possible. More than 50% of property in affected area damaged or destroyed. Complete shutdown of critical facilities for 30 days or more.

To concentrate resources on highest priority hazards, the jurisdictional planning team will focus on "High" and "Extreme" risk hazards in this annex. These hazards have higher probability and greater impact as it relates to the jurisdiction's planning area.

Hazard definitions are included in Vol. 1 of this plan.

Hazard Information / Legend:



Climate Change is prioritized for all jurisdictions.



Sea-Level Rise is a subhazard of climate change for some jurisdictions (County, Vallejo, Benicia, Suisun City, Fairfield).



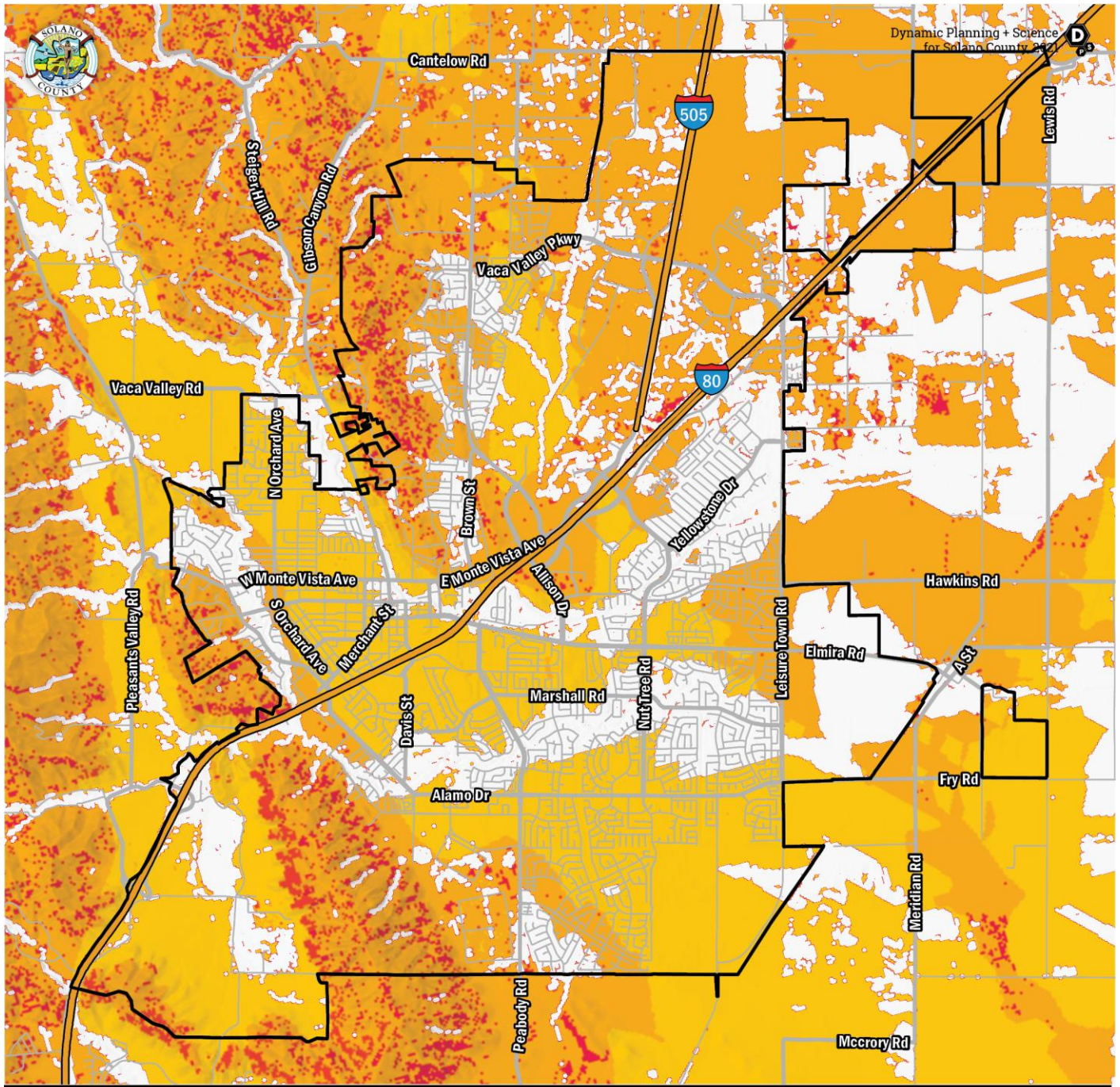
Extreme Weather in Solano County includes high heat, high wind, and heavy rain.

If a hazard symbol is grey, the planning team did not develop hazard vulnerability information due to lower perceived probability and impact.

City of Vacaville Risk Matrix

		IMPACT			
		Minor	Limited	Critical	Catastrophic
PROBABILITY	Highly Likely	Medium	EXTREME WEATHER	WILDFIRE	Extreme
	Likely	Medium	DROUGHT	FLOOD	Extreme
	Possible	Low	Medium	SLOPE FAILURE EARTHQUAKE	High
	Unlikely	Low	Low	Medium	Medium

Figure 6-4: City of Vacaville Risk Assessment



MEAN FIRE RETURN INTERVAL VACAVILLE

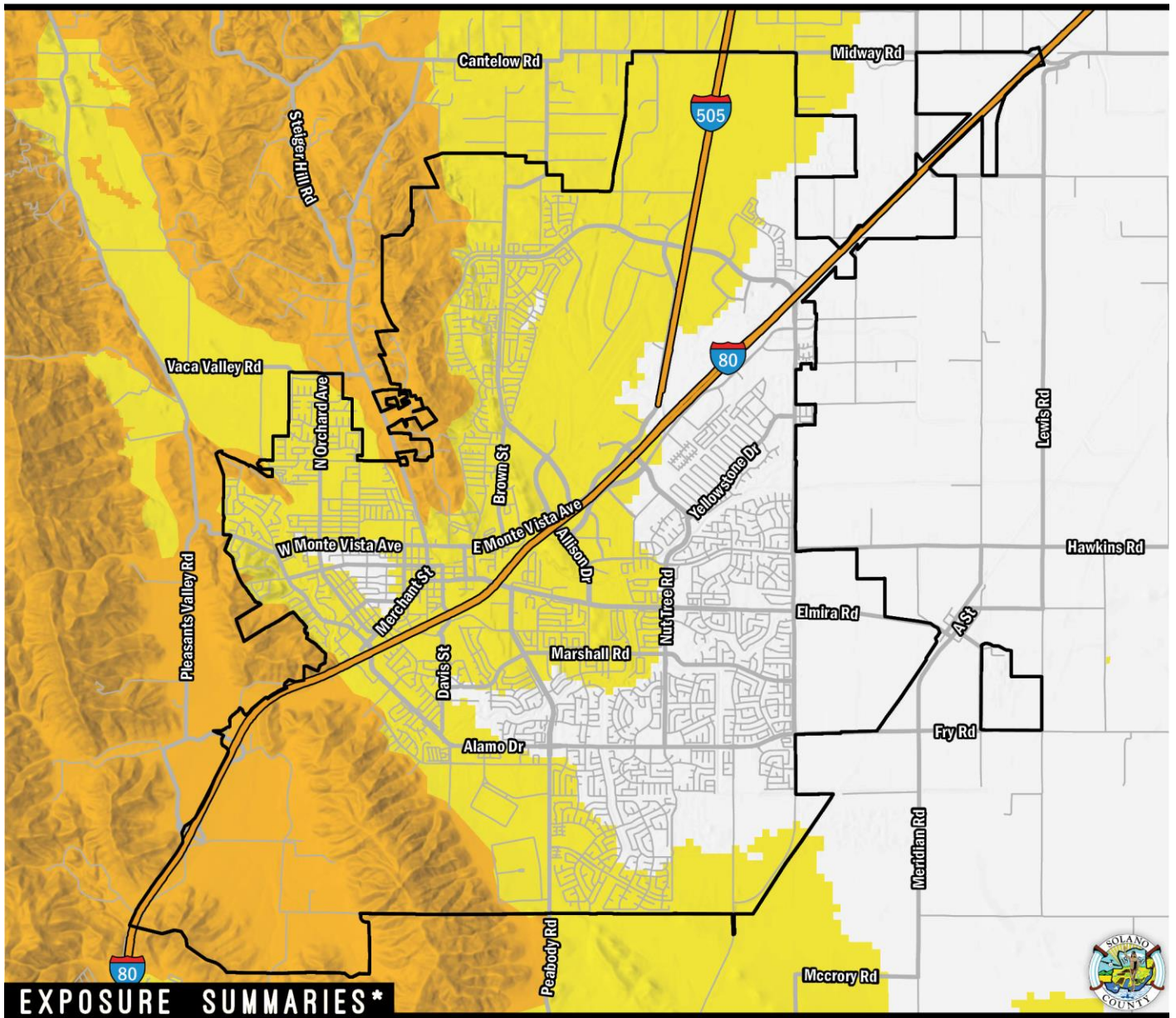
*Data sources: USGS LANDFIRE.

Figure 6-5: City of Vacaville - Mean Fire Return Interval



WILDFIRE RISK EXPOSURE

VACAVILLE



EXPOSURE SUMMARIES*

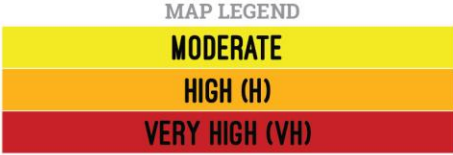
POPULATION COUNT IN HAZARD AREA	
Count	Exp. Rate**
8,666	9%
Count Includes: H VH	

PARCEL COUNT IN HAZARD AREA	
Count	Exp. Rate**
330	1%
Count Includes: H VH	

PARCEL VALUE IN HAZARD AREA	
Sum of Improvement Value	Exp. Rate**
\$261,677,229	1%
Sum of Content Value	
\$133,704,694	1%
Count Includes: H VH	

CRITICAL INFRASTRUCTURE COUNTS IN HAZARD AREA			
Infrastructure Category	Count	Exp. Rate**	Count/Sum Includes:
Essential Facilities	1	5%	H VH
High Potential Loss	44	9%	
Transportation & Lifeline	10	2%	54 9%

Sum of Transportation & Lifeline Linear Mileage



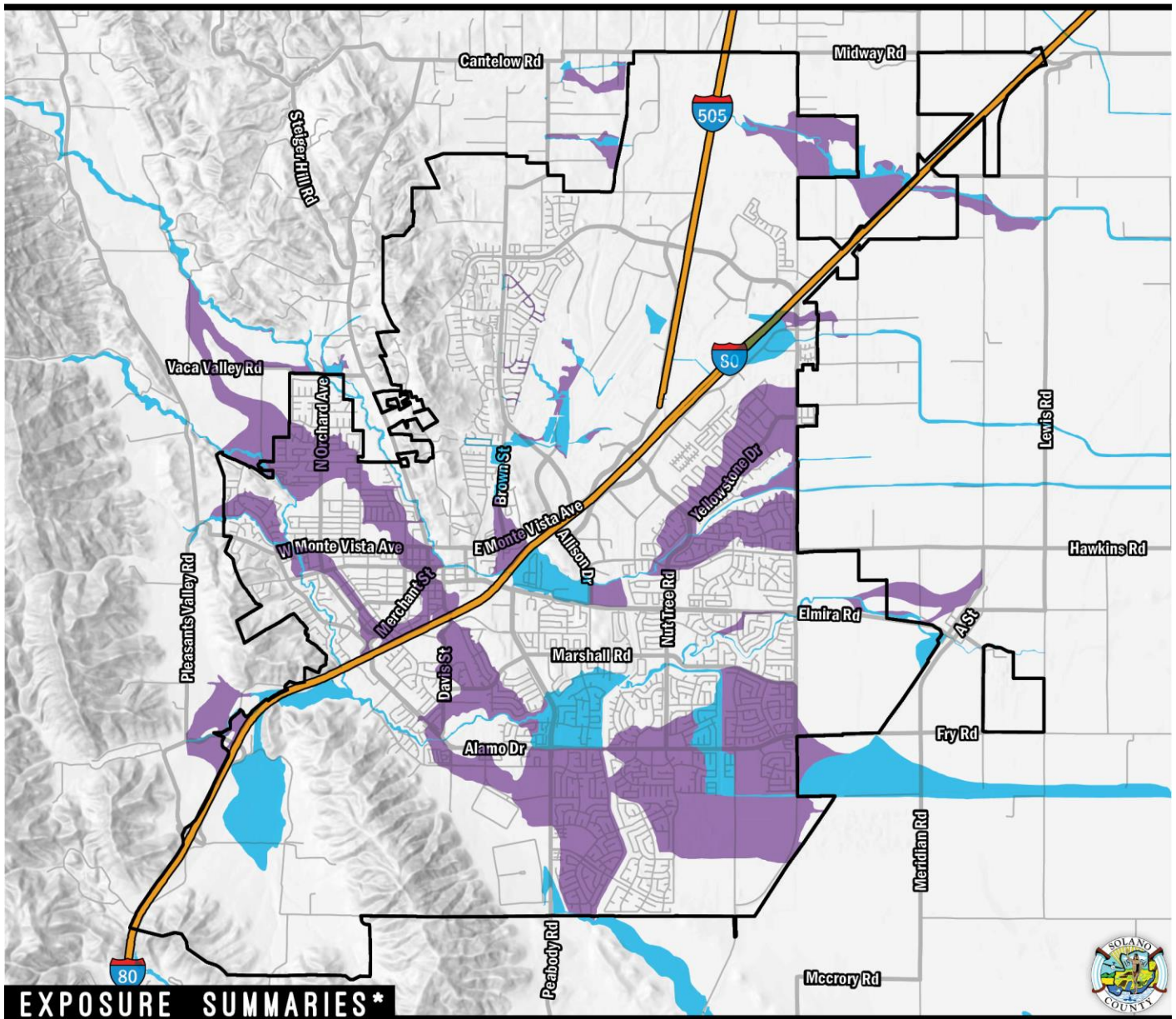
*Exposure summaries include high and very high risk areas. Hazard data source: Cal Fire, CPUC.
 **Exposure Rate - Exposed summary or count as a percentage of total summary or count within jurisdiction.
 Dynamic Planning + Science for Solano County, 2021

Figure 6-6: City of Vacaville – Wildfire Risk Exposure



FEMA FLOOD RISK EXPOSURE

VACAVILLE



EXPOSURE SUMMARIES*

POPULATION COUNT IN HAZARD AREA		PARCEL COUNT IN HAZARD AREA		PARCEL VALUE IN HAZARD AREA		CRITICAL INFRASTRUCTURE COUNTS IN HAZARD AREA			
Count	Exp. Rate**	Count	Exp. Rate**	Sum of Improvement Value	Exp. Rate**	Infrastructure Category	Count	Exp. Rate**	Count/Sum Includes:
36,163	37%	10,908	39%	\$5,329,010,112	30%	Essential Facilities	5	24%	100 + 500
Count Includes: 100 + 500		Count Includes: 100 + 500		\$2,860,539,299	24%	High Potential Loss	149	31%	Sum of Transportation & Lifeline Linear Mileage
				Count Includes: 100 + 500		Transportation & Lifeline	213	42%	163 28%

MAP LEGEND

100-YR **COASTAL**

AREA PROTECTED BY LEVEE

500-YR

*Exposure summaries include 100-year and 500-year flood zone areas, including coastal and leveed areas. Hazard data source: FEMA.
 **Exposure Rate - Exposed summary or count as a percentage of total summary or count within jurisdiction.

Dynamic Planning + Science
for Solano County, 2021

Figure 6-7: City of Vacaville – FEMA Flood Risk Exposure



Table 6-6: City of Vacaville - Damage Estimate Summaries, 100YR Flood

Building Type	Building Damage (\$)	Building Damage (% of total loss)	Content Damage (\$)	Content Damage (% of total loss)	Total Damage (\$)	Proportion of Loss (%)
Agriculture	\$0	0.0%	\$0	0.0%	\$0	0%
Commercial	\$1,145,058	1.1%	\$4,863,361	4.5%	\$6,008,419	6%
Education*	\$0	0.0%	\$0	0.0%	\$0	0%
Emergency	\$0	0.0%	\$0	0.0%	\$0	0%
Government	\$2,164	0.0%	\$0	0.0%	\$2,164	0%
Industrial	\$3,110	0.0%	\$532	0.0%	\$3,642	0%
Religion	\$78,969	0.1%	\$410,640	0.4%	\$489,609	0%
Residential	\$75,006,608	69.7%	\$26,101,648	24.3%	\$101,108,256	94%
Total	\$76,235,910	71%	\$31,376,180	29%	\$107,612,090	

*School district asset information not available during time of Hazus analysis.

Note: Total Inventory Values

1 - Building Replacement Costs = \$3,773,922,295

2 - Content Replacement Costs = \$2,667,166,517

3 - Total Value = \$6,441,088,812

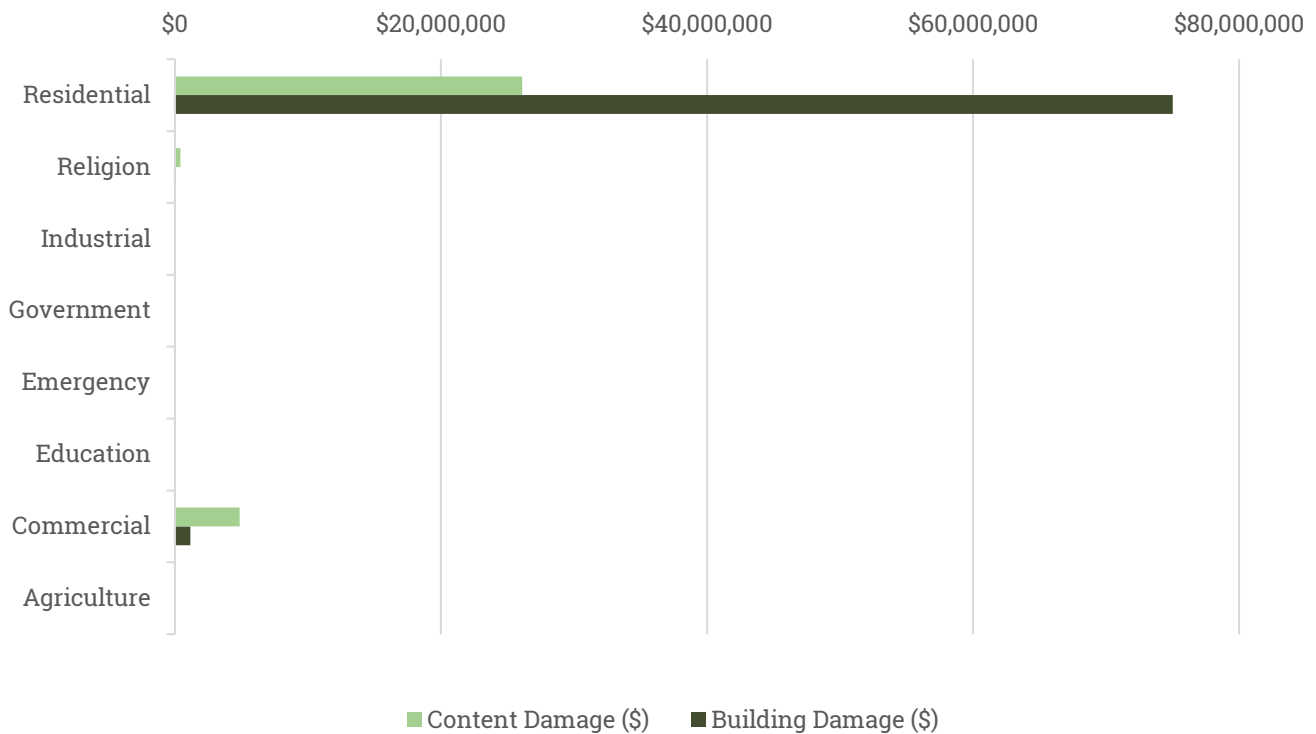




Table 6-7: City of Vacaville - Damage Estimate Summaries, 500YR Flood

Building Type	Building Damage (\$)	Building Damage (% of total loss)	Content Damage (\$)	Content Damage (% of total loss)	Total Damage (\$)	Proportion of Loss (%)
Agriculture	\$0	0.0%	\$16	0.0%	\$16	0%
Commercial	\$452,171	0.1%	\$1,478,760	0.2%	\$1,930,931	0%
Education*	\$40,734	0.0%	\$219,963	0.0%	\$260,696	0%
Emergency	\$0	0.0%	\$0	0.0%	\$0	0%
Government	\$19,496	0.0%	\$20,286	0.0%	\$39,782	0%
Industrial	\$2,242	0.0%	\$24,587	0.0%	\$26,830	0%
Religion	\$11,491	0.0%	\$103,544	0.0%	\$115,035	0%
Residential	\$580,557,517	75.4%	\$186,630,998	24.3%	\$767,188,515	100%
Total	\$581,083,652	76%	\$188,478,154	24%	\$769,561,805	

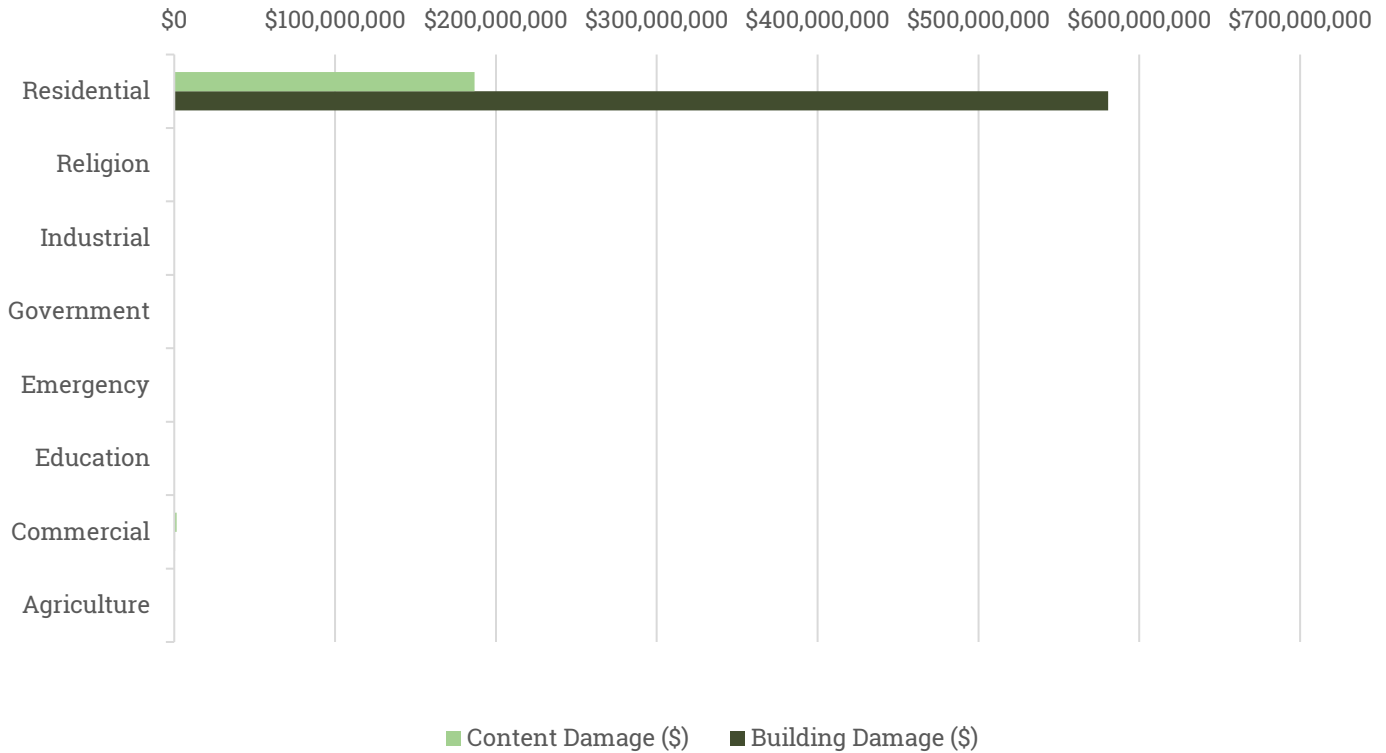
*School district asset information not available during time of Hazus analysis.

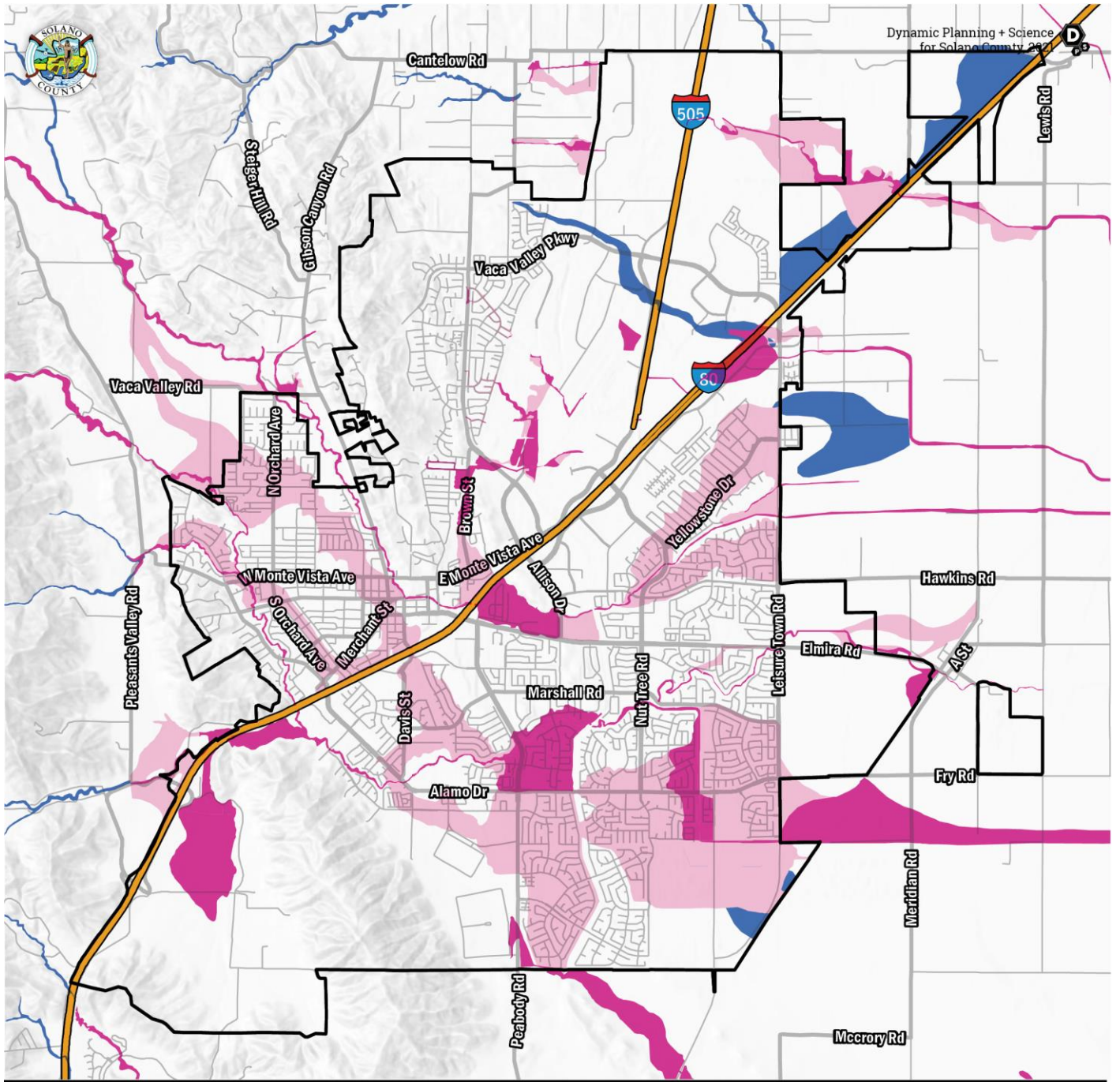
Note: Total Inventory Values

1 - Building Replacement Costs = \$3,773,922,295

2 - Content Replacement Costs = \$2,667,166,517

3 - Total Value = \$6,441,088,812





BAM 200-YR FLOODING AND AWARENESS ZONES VACAVILLE

*Data sources: DWR.

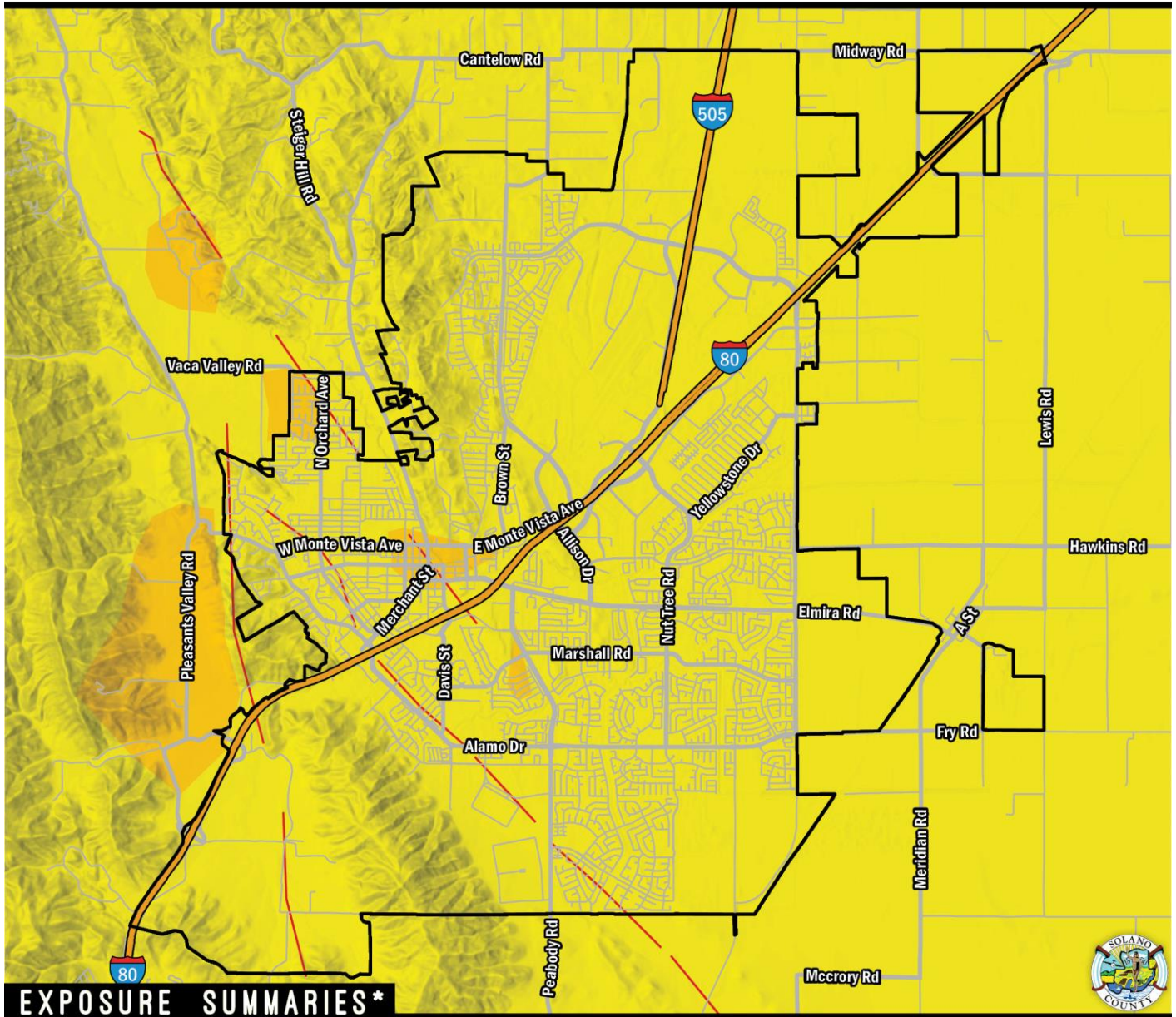
FEMA FLOOD ZONES		DWR AWARENESS ZONES
 100-YR (SFHA)	 500-YR	
USACE SAC. SAN JOAQUIN R. COMPREHENSIVE STUDY		
 100-YR	 200-YR	 500-YR

Figure 6-8: City of Vacaville – BAM 200-YR Flooding and Awareness Zones



CONCORD-GREEN VALLEY EARTHQUAKE SCENARIO (M6.8)

VACAVILLE



EXPOSURE SUMMARIES*

POPULATION COUNT IN HAZARD AREA

Count	Exp. Rate**
97,943	100%
Count Includes: S+++E	

PARCEL COUNT IN HAZARD AREA

Count	Exp. Rate**
27,956	100%
Count Includes: S+++E	

PARCEL VALUE IN HAZARD AREA

Sum of Improvement Value	Exp. Rate**
\$17,694,597,732	100%
Sum of Content Value	Exp. Rate**
\$11,850,613,476	100%
Count Includes: S+++E	

CRITICAL INFRASTRUCTURE COUNTS IN HAZARD AREA

Infrastructure Category	Count	Exp. Rate**	Count/Sum Includes:
Essential Facilities	21	100%	S+++E
High Potential Loss	476	100%	Sum of Transportation & Lifeline Linear Mileage
Transportation & Lifeline	504	100%	

MAP LEGEND

III	IV	V	VI	VII	VIII	IX	X
WEAK	LIGHT	MODERATE	STRONG	VERY STRONG	SEVERE	VIOLENT	EXTREME
MMI							

*Exposure summaries include strong, very strong, violent, and severe MMI classes. Hazard data source: USGS.

**Exposure Rate - Exposed summary or count as a percentage of total summary or count within jurisdiction.

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Figure 6-9: City of Vacaville – Concord Green Valley EQ Scenario (M6.8)



Table 6-8: City of Vacaville Concord Green Valley Damage Estimate Summary

Building Type	Average of Potential Damage to Exceed "Slight"	Average of Potential Damage to Exceed "Moderate"	Average of Potential Damage to Exceed "Extensive"	Average Economic Loss for Each Building Category	Sum of Economic Loss	Proportion of Loss (%)
Agriculture	32%	15%	2%	\$2,068	\$16,543	0%
Commercial	22%	5%	1%	\$234,863	\$140,682,884	28%
Education*	44%	23%	6%	\$501,784	\$5,017,841	1%
Emergency	16%	3%	0%	\$60,948	\$426,635	0%
Government	19%	4%	0%	\$26,588	\$3,296,954	1%
Industrial	35%	14%	2%	\$737,078	\$84,026,881	17%
Religion	18%	3%	0%	\$55,879	\$2,458,690	0%
Residential	16%	2%	0%	\$9,510	\$258,343,995	52%
Total					\$494,270,422	

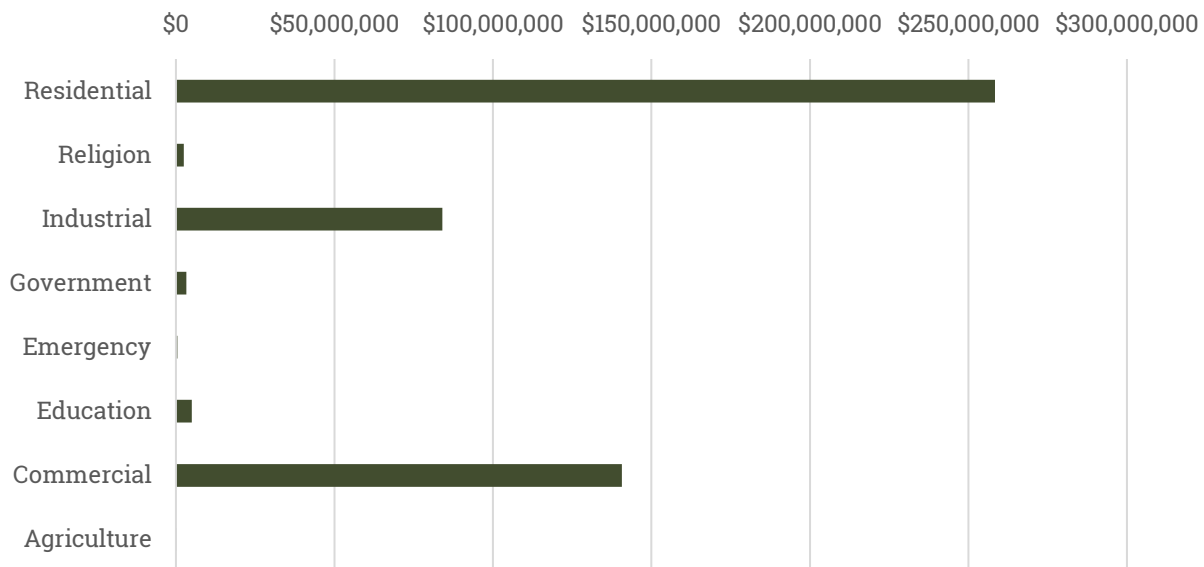
*School district asset information not available during time of Hazus analysis.

Note: Total Inventory Values

1 - Building Replacement Costs = \$3,773,922,295

2 - Content Replacement Costs = \$2,667,166,517

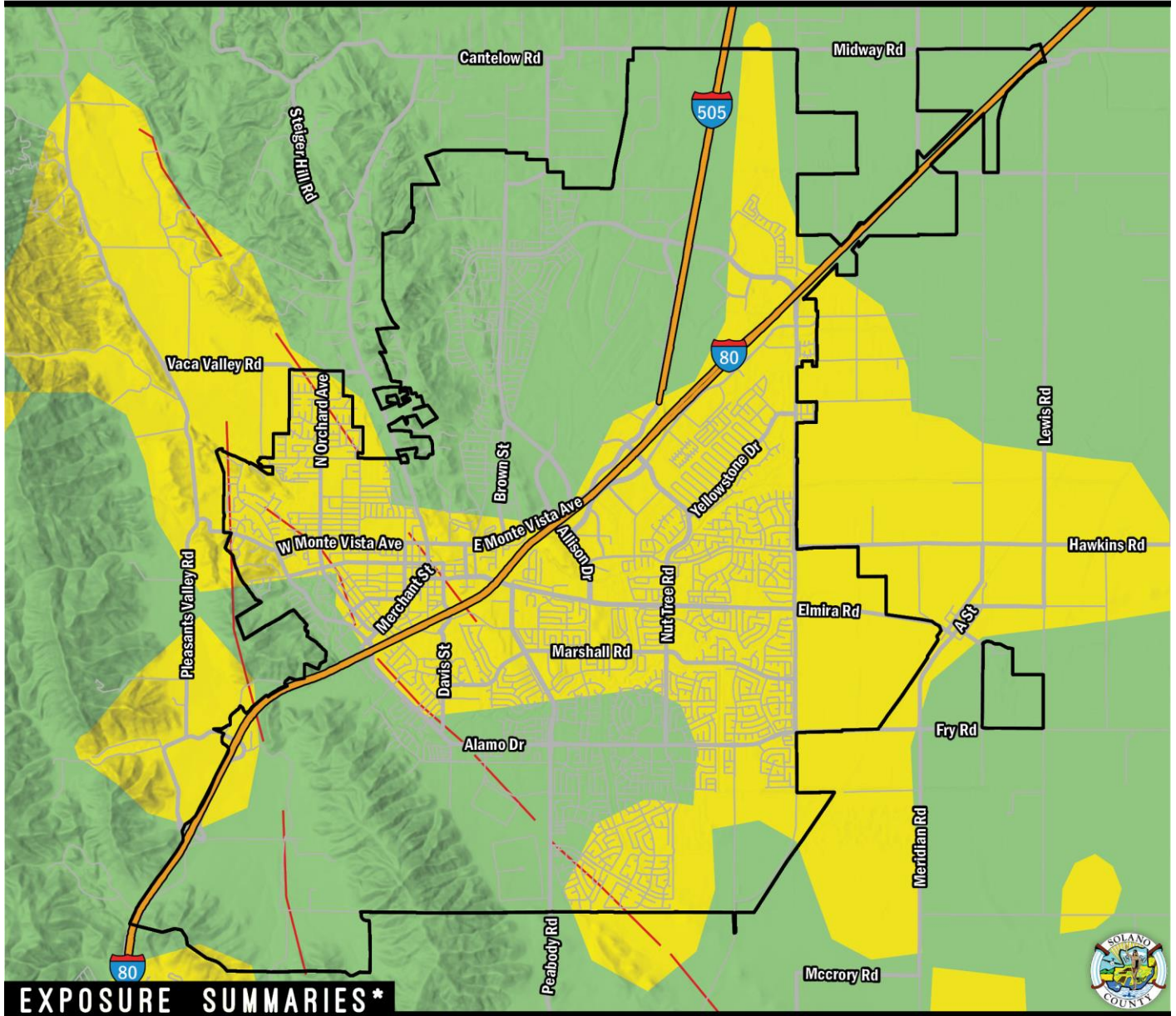
3 - Total Value = \$6,441,088,812





HAYWARD-RODGER'S CREEK EARTHQUAKE SCENARIO (M7.1)

VACAVILLE



EXPOSURE SUMMARIES*

POPULATION COUNT IN HAZARD AREA		PARCEL COUNT IN HAZARD AREA		PARCEL VALUE IN HAZARD AREA		CRITICAL INFRASTRUCTURE COUNTS IN HAZARD AREA			
Count	Exp. Rate**	Count	Exp. Rate**	Sum of Improvement Value	Exp. Rate**	Infrastructure Category	Count	Exp. Rate**	Count/Sum Includes:
53,332	54%	18,765	67%	\$11,040,730,752	62%	Essential Facilities	13	62%	S+++E
Count Includes: S+++E		Count Includes: S+++E		Sum of Content Value	59%	High Potential Loss	295	62%	Sum of Transportation & Lifeline Linear Mileage
				\$6,981,655,734		Transportation & Lifeline	336	67%	
				Count Includes: S+++E					

MAP LEGEND

III	IV	V	VI	VII	VIII	IX	X
WEAK MMI	LIGHT	MODERATE	STRONG	VERY STRONG	SEVERE	VIOLENT	EXTREME

*Exposure summaries include strong, very strong, violent, and severe MMI classes. Hazard data source: USGS.
 **Exposure Rate - Exposed summary or count as a percentage of total summary or count within jurisdiction.

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Figure 6-10: City of Vacaville – Hayward Rodger’s Creek EQ Scenario (M7.1)



Table 6-9: City of Vacaville - Hayward Rodger's Creek Damage Estimate Summary

Building Type	Average of Potential Damage to Exceed "Slight"	Average of Potential Damage to Exceed "Moderate"	Average of Potential Damage to Exceed "Extensive"	Average Economic Loss for Each Building Category	Sum of Economic Loss	Proportion of Loss (%)
Agriculture	14%	5%	1%	\$789	\$6,310	0%
Commercial	8%	1%	0%	\$68,665	\$41,130,441	29%
Education*	18%	7%	1%	\$154,199	\$1,541,987	1%
Emergency	5%	1%	0%	\$15,167	\$106,169	0%
Government	6%	1%	0%	\$7,539	\$934,851	1%
Industrial	14%	4%	0%	\$250,021	\$28,502,344	20%
Religion	5%	1%	0%	\$14,176	\$623,752	0%
Residential	5%	0%	0%	\$2,488	\$67,593,311	48%
Total					\$140,439,165	

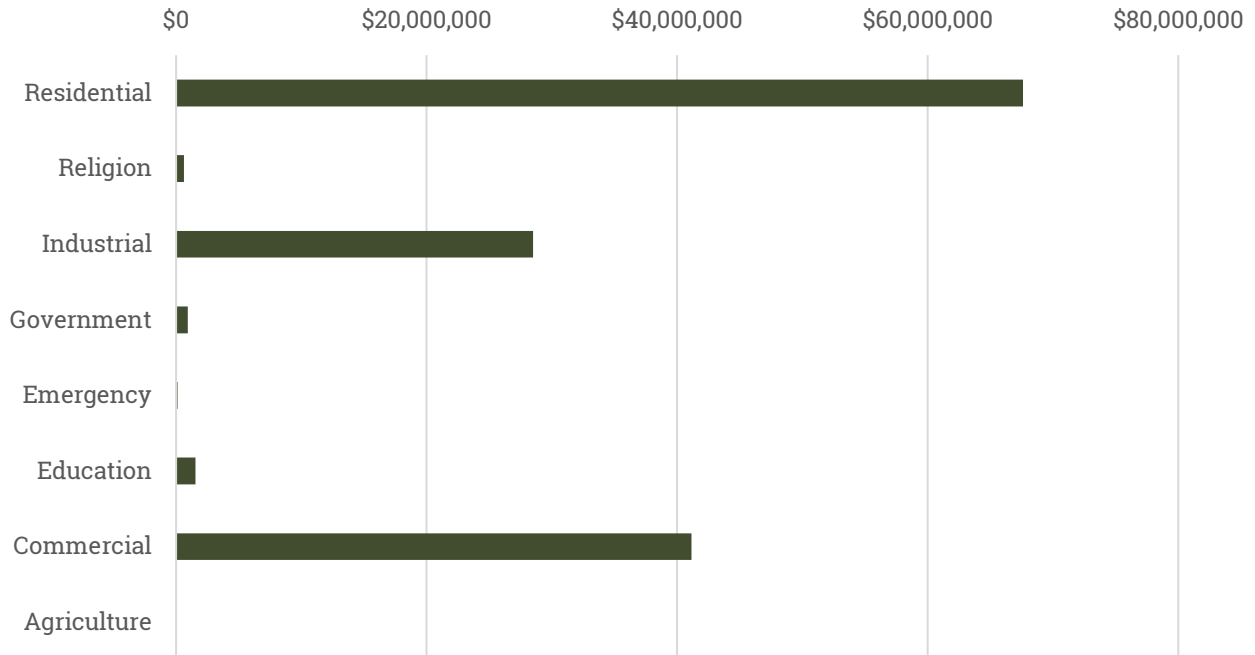
*School district asset information not available during time of Hazus analysis.

Note: Total Inventory Values

1 - Building Replacement Costs = \$3,773,922,295

2 - Content Replacement Costs = \$2,667,166,517

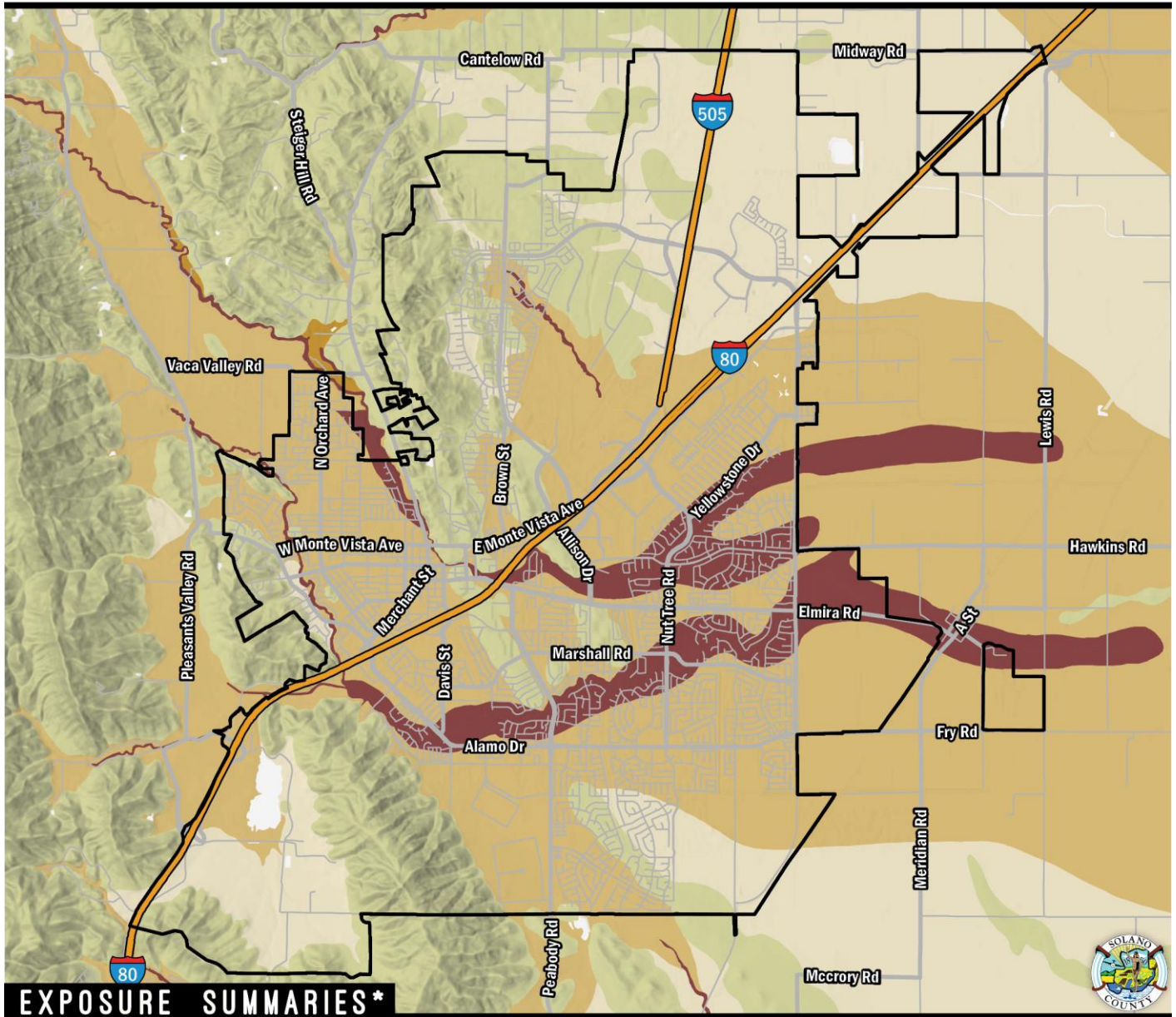
3 - Total Value = \$6,441,088,812





AREAS WITH POTENTIAL FOR LIQUEFACTION

VACAVILLE



EXPOSURE SUMMARIES*

POPULATION COUNT
IN HAZARD AREA

Count	Exp. Rate**
75,003	77%
Count Includes:	M H VH

PARCEL COUNT
IN HAZARD AREA

Count	Exp. Rate**
21,162	76%
Count Includes:	M H VH

PARCEL VALUE
IN HAZARD AREA

Sum of Improvement Value	Exp. Rate**
\$11,377,189,358	64%
Sum of Content Value	Exp. Rate**
\$6,715,399,890	57%
Count Includes:	M H VH

CRITICAL INFRASTRUCTURE COUNTS
IN HAZARD AREA

Infrastructure Category	Count	Exp. Rate**	Count/Sum Includes:
Essential Facilities	16	76%	M H VH
High Potential Loss	386	81%	Sum of Transportation & Lifeline Linear Mileage
Transportation & Lifeline	404	80%	

MAP LEGEND

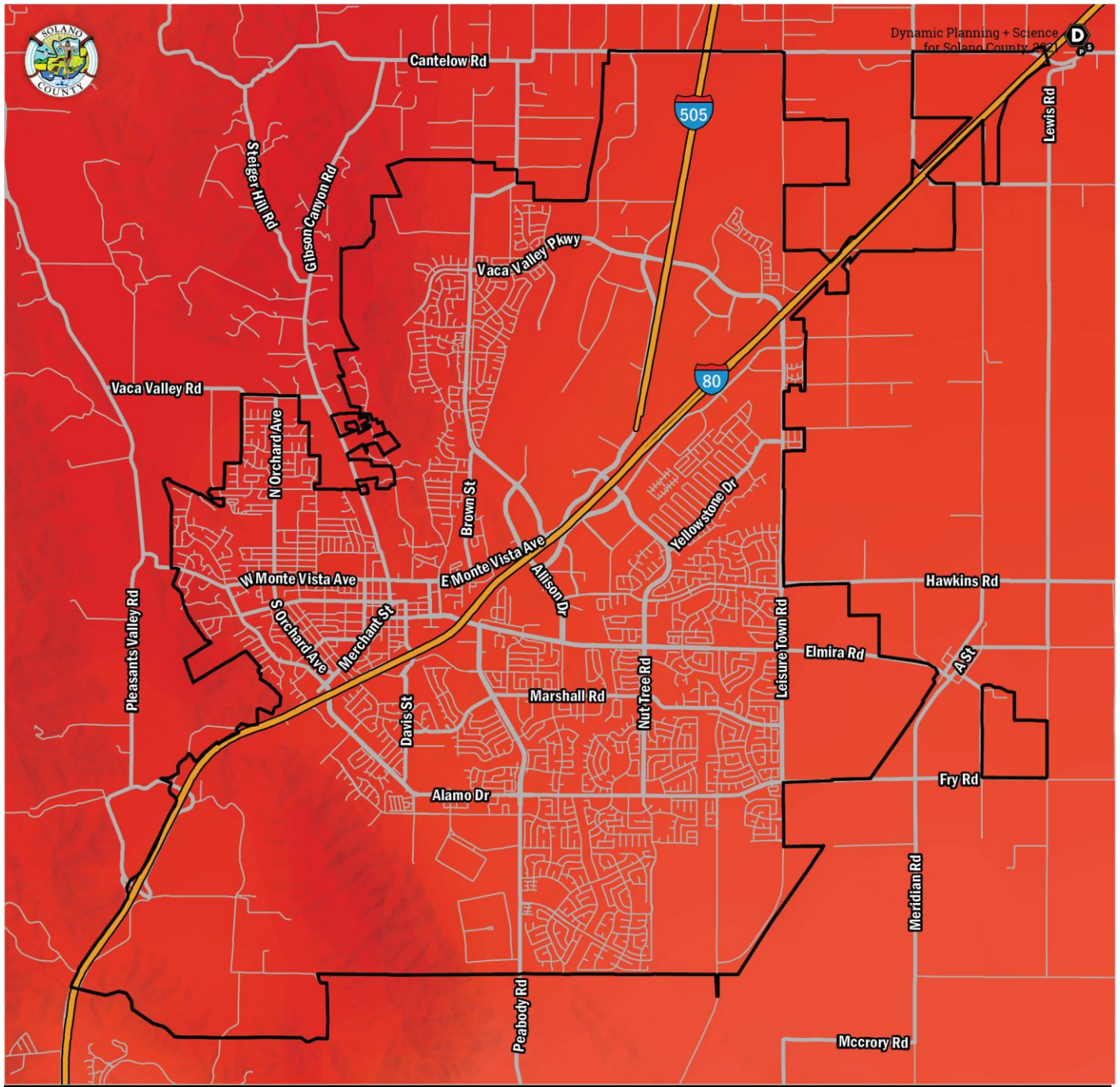
VL	L	M	H	VH
VERY LIGHT	LIGHT	MODERATE	HIGH	VERY HIGH

*Exposure summaries include medium, high, very high susceptibility. Hazard data source: USGS.

**Exposure Rate - Exposed summary or count as a percentage of total summary or count within jurisdiction.

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Figure 6-11: City of Vacaville – Areas with Potential for Liquefaction

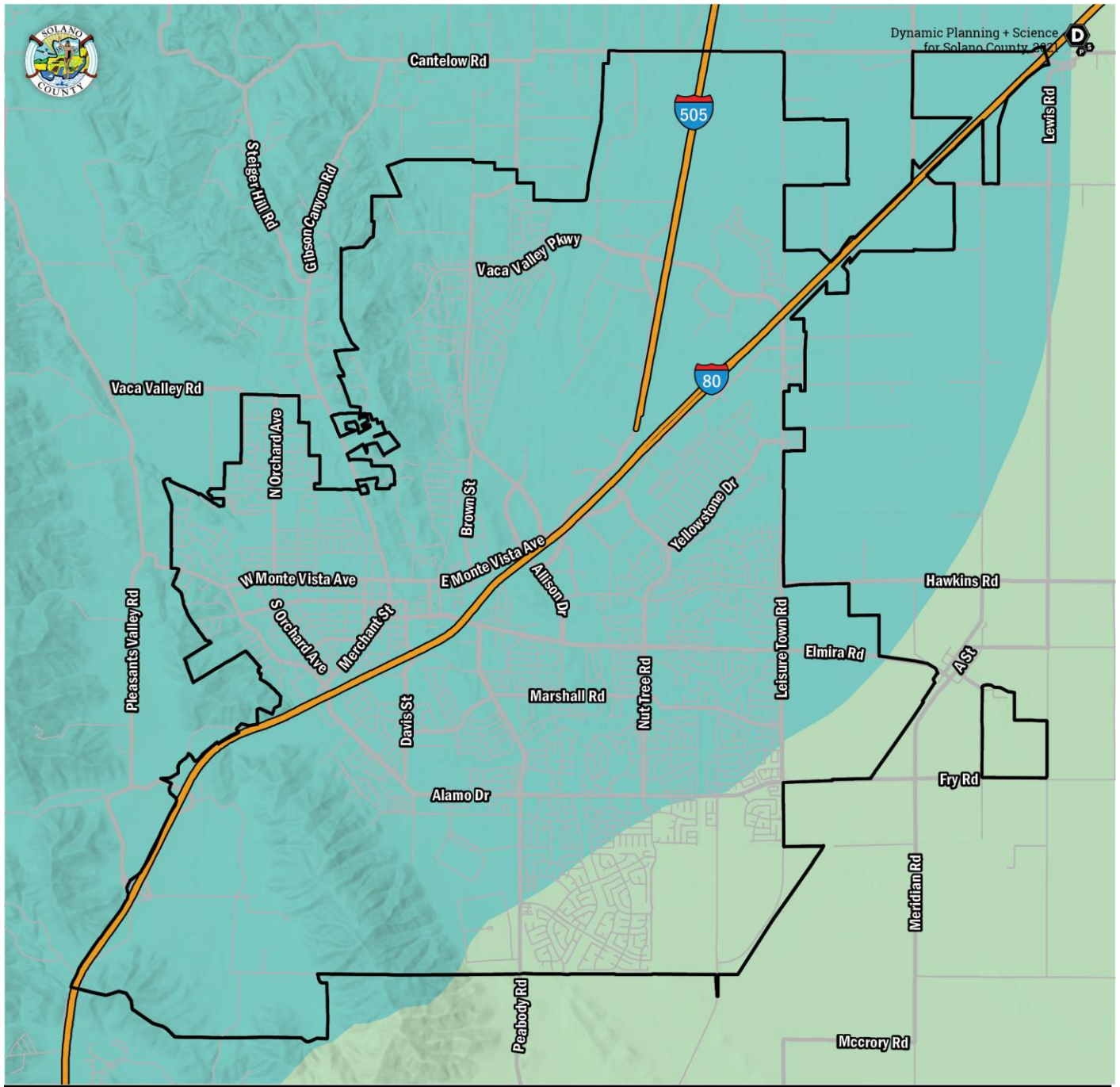


30-YR NORMAL MAXIMUM TEMPERATURE FOR JULY VACAVILLE

*Data sources: PRISM 800m Resolution 30-YR Normals.



Figure 6-12: City of Vacaville – 30-YR Normal Maximum Temperature for July

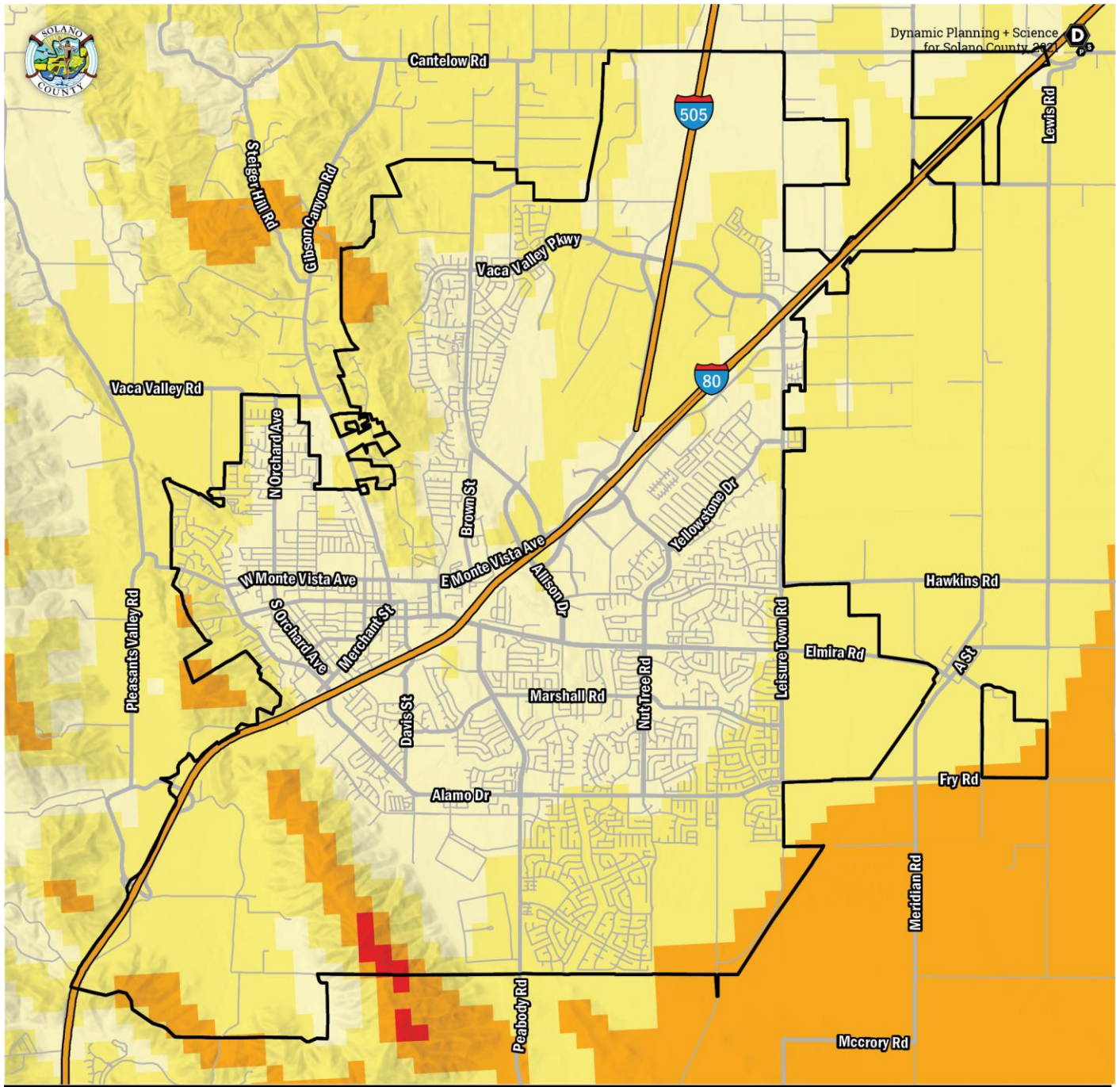


AVERAGE ANNUAL PRECIPITATION (1981-2010, INCHES) VACAVILLE

*Data sources: USDA - 1981-2010 Annual Average Precipitation by State.

14	18	23	28	33
17	22	27	32	37
INCHES				

Figure 6-13: City of Vacaville – Average Annual Precipitation (1981-2012, Inches)



**ANNUAL AVERAGE WIND SPEED (POWER CLASS)
VACAVILLE**

*Data sources: NREL.



Figure 6-14: City of Vacaville – Annual Average Wind Speed (Power Class)



Table 6-10: Drought Classifications and Impacts

Category	Description	Possible Impacts
D0	Abnormally Dry	<ul style="list-style-type: none"> Active fire season begins Going into drought, short term dryness, slowing planting, growth of crops or pastures. Coming out of drought, some lingering water deficits and pasture or crops not fully recovered,
D1	Moderate Drought	<ul style="list-style-type: none"> Some damage to crops, pastures Streams, reservoirs, or wells low, some water shortages developing or imminent Voluntary water-use restrictions requested
D2	Severe Drought	<ul style="list-style-type: none"> Crop or pasture losses likely Water shortages common Water restrictions imposed
D3	Extreme Drought	<ul style="list-style-type: none"> Major crop/ pasture losses Widespread water shortages or restrictions
D4	Exceptional Drought	<ul style="list-style-type: none"> Exceptional and widespread crop/ pasture losses Shortages of water in reservoirs, streams, and wells creating water

Adapted from U.S. Drought Monitor Drought Classifications and Impacts

Drought Severity Timeline

Lower Sacramento

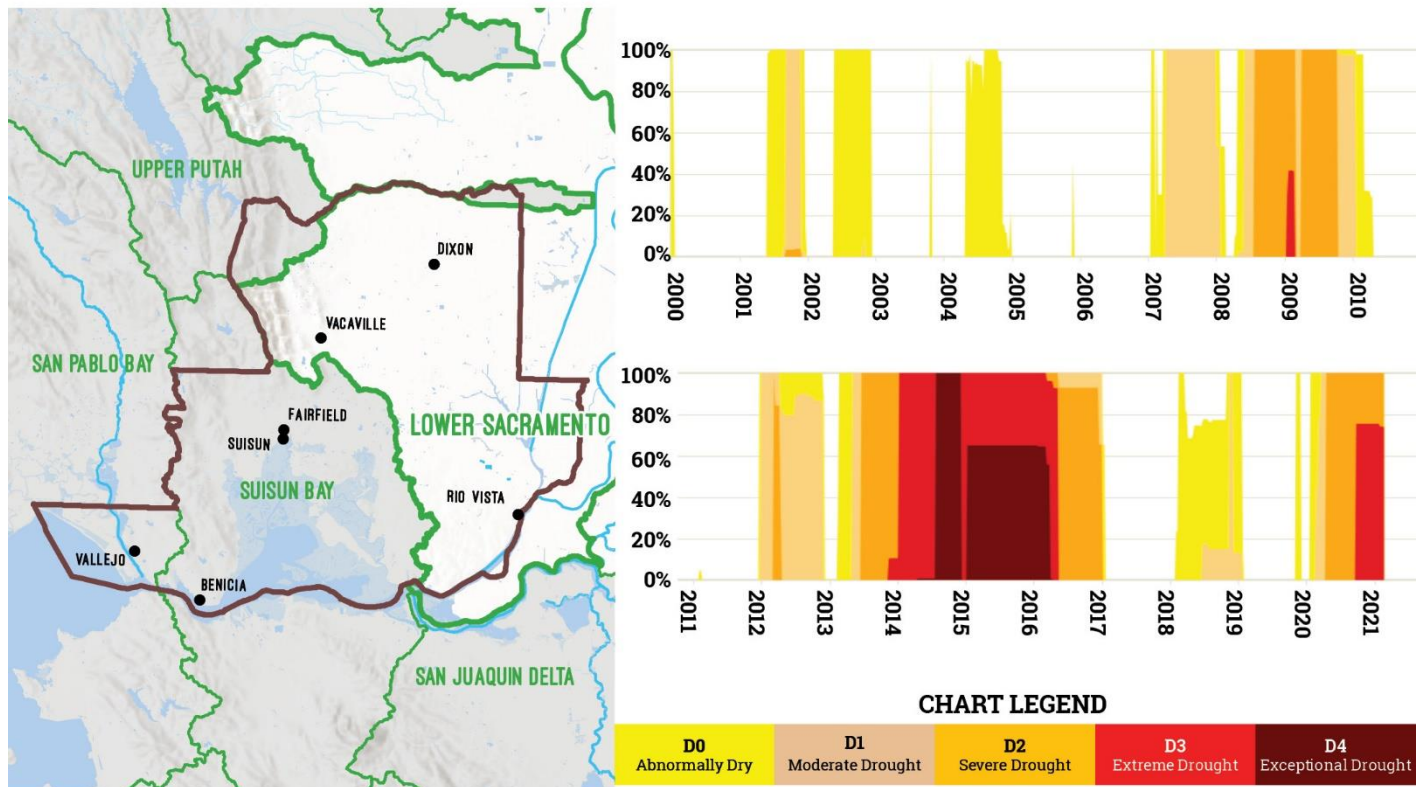
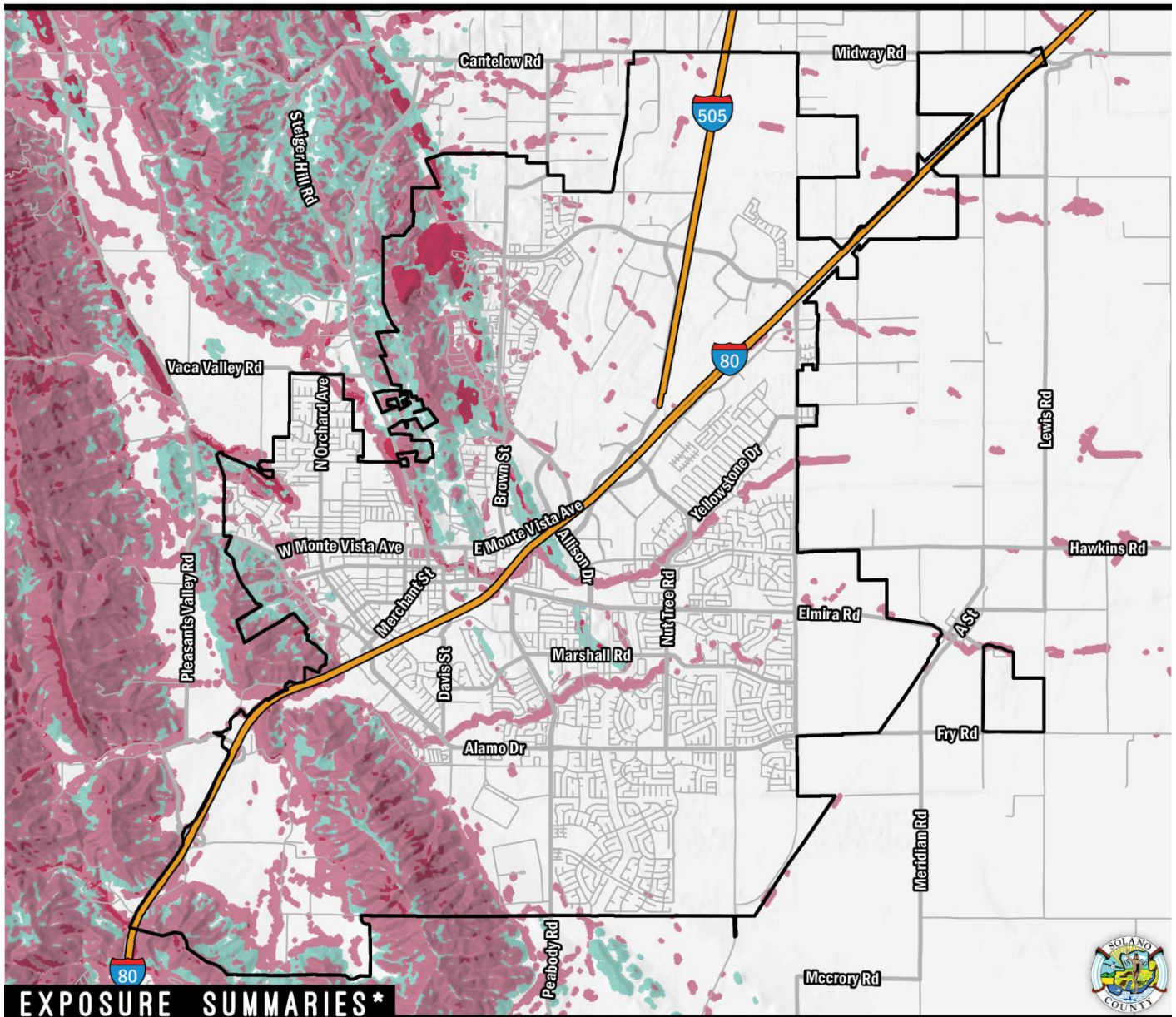


Figure 6-15: City of Vacaville– Drought Severity Timeline for Lower Sacramento Watershed



LANDSLIDE RISK EXPOSURE

VACAVILLE



EXPOSURE SUMMARIES*

POPULATION COUNT IN HAZARD AREA	
Count	Exp. Rate**
938	1%
Count Includes:	HIGH

PARCEL COUNT IN HAZARD AREA	
Count	Exp. Rate**
125	0%
Count Includes:	HIGH

PARCEL VALUE IN HAZARD AREA	
Sum of Improvement Value	Exp. Rate**
\$75,330,790	0%
Sum of Content Value	0%
\$39,172,915	HIGH
Count Includes:	

CRITICAL INFRASTRUCTURE COUNTS IN HAZARD AREA			
Infrastructure Category	Count	Exp. Rate**	Count/Sum Includes:
Essential Facilities	0	0%	HIGH
High Potential Loss	2	0%	Sum of Transportation & Lifeline Linear Mileage
Transportation & Lifeline	1	0%	

MAP LEGEND	
LOW	
MODERATE	
HIGH	

*Exposure summaries include high susceptibility only. Hazard data source: CGS.
**Exposure Rate - Exposed summary or count as a percentage of total summary or count within jurisdiction.

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Figure 6-16: City of Vacaville – Landslide Risk Exposure



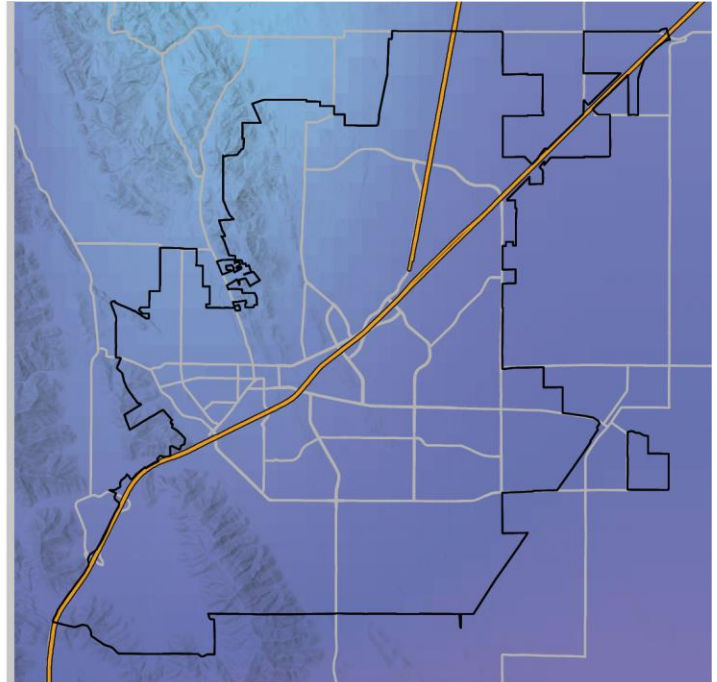
VACAVILLE

AVERAGE ANNUAL MAXIMUM TEMPERATURE

COMPARISON OF CURRENT OBSERVED TO RCP 4.5 AND RCP 8.5 SCENARIOS



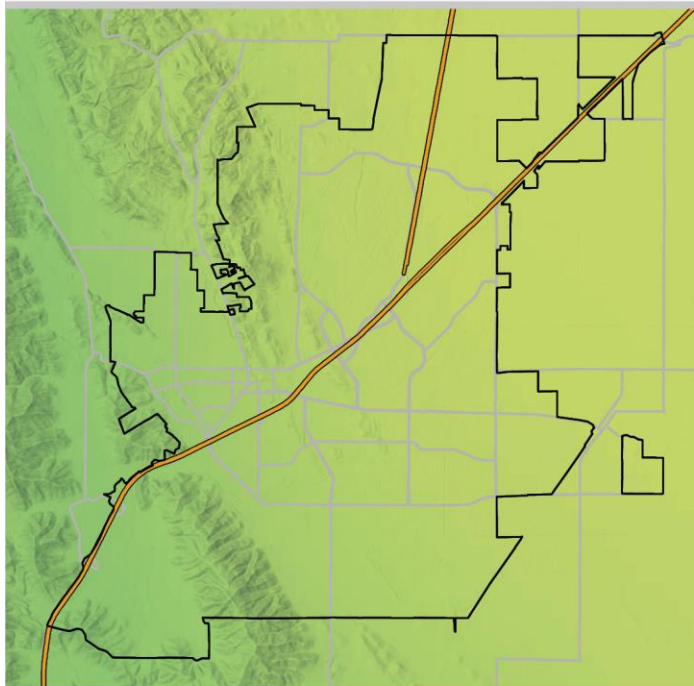
*Data sources: Cal-Adapt CanESM2 RCP 4.5 & 8.5, PRISM 30-YR Norms Annual Max Temp



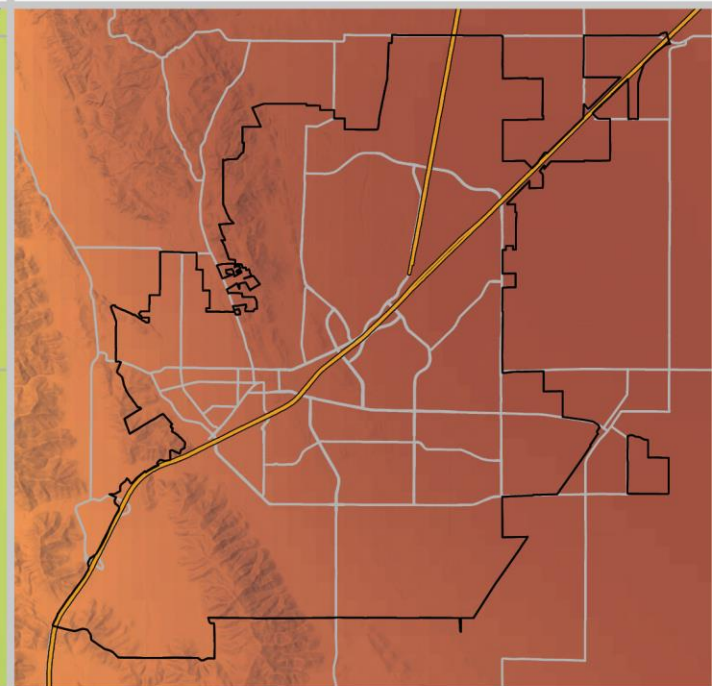
CURRENT 30-YR NORMAL



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RCP 4.5 YEAR 2100



RCP 8.5 YEAR 2100

Figure 6-17: City of Vacaville– RCP Comparison



6.4.3.3 Past and Future Development

The City of Vacaville is a general law city that crafts its own development regulations and is subject to State law. Future development is subject to compliance with state and local planning, zoning, subdivision, and architecture laws.

The City of Vacaville's General Plan (GP) establishes long-range development policies. The GP is designed to help the City address issues related to land use, circulation (traffic), housing, open space, conservation, noise, and safety. The Land Use portion of the plan helps guide the City in determining the location of future development(s), including possible future annexation. In addition to the GP, the City has other plans that guide development in specific areas, including specific plans, policy plans, and master plans. These plans help to shape future development and dictate the City's Sphere of Influence (SOI). One of the central functions in these planning documents is to decrease risk of impact from natural hazards.

Development since Previous HMP

The City of Vacaville considered its growth since the last HMP and determined it had completed a central mitigation action and substantially decreased its vulnerability to hazards. The City strengthened its weed abatement ordinance above state standards to ensure future and current development does not increase wildfire vulnerability. The City also completed an enlarged detention basin in the Rancho Rogelio Subdivision to increase flood resiliency. Finally, the City made substantial progress on its reclaimed water system, which will reduce drought vulnerability for current and future development. This HMP Annex has been revised to reflect this substantial change in past development and continues to focus on avenues to better mitigate impacts from problematic past development.

Future Development

City of Vacaville is required to update building codes to meet the minimum standards to those required in the California Building Code last updated in 2019. California Building Codes provide some of the safest construction standards in the world and are meant to reduce risk to occupants from high wind, seismic activity, landslides, flood, wildfire, and other natural hazards. In addition to California minimum development standards, all jurisdictions belong to the NFIP, and all development must meet minimum flood protection standards set forth by FEMA. See Section 4.3.5 of Volume 1 for more information about past and future development in Solano County.

As the General Plan is updated and incorporates information from this HMP, City of Vacaville staff are continually improving hazard information through these hazard mitigation plan updates. With this 2020 update, improved online mapping about natural hazards available on RAMP will inform those responsible for future development to make better decisions where and how future development occurs.



City of Vacaville reviewed its general plans under the capability assessments undertaken for this hazard mitigation plan. See Section 6.5.1. Deficiencies revealed by these reviews are identified as mitigation actions to decrease risks to move beyond past trends.

The City is currently reviewing and revising its municipal code, including with a hazard resiliency lens. The City currently regulates weed abatement above state requirements. The City's municipal codes includes regulations to mitigate the impact of hazards on new and existing development, including:

- Drainage and stormwater retention requirements,
- Steep slope restrictions for new development,
- Waterbody buffer requirements,
- Floodplain management regulations,
- Zoning that prevents development in hazardous areas of the community such as floodplains, landslide areas, the wildland-urban interface (WUI), or other known hazard areas, and
- Building codes that include the most up-to-date California Fire Code, seismic standards, and many other provisions crafted to protect new construction from hazard events.

Even in the event that limited development did occur within a hazard area, the municipal code should ensure impacts from a hazard event are mitigated and losses are minimal. If development does occur in hazard areas, evacuation and emergency planning should take into consideration the anticipated local impacts of the hazard event, including potential interrupted services or the elimination of access.

The anticipated growth in the City will not cause significant change in vulnerability to the City for identified priority hazards.

National Flood Insurance Program (NFIP)

The NFIP makes federally backed flood insurance available to homeowners, renters, and business owners in participating communities. FEMA has prepared a detailed Flood Insurance Study (FIS) for Solano County and municipalities. The study presents water surface elevations for floods of various magnitudes, including the 1-percent annual chance flood and the 0.2-percent annual chance flood (the 500-YR flood). Base flood elevations and the boundaries of the 100- and 500-YR floodplains are shown on Flood Insurance Rate Maps (FIRMs), which are the principal tools for identifying the extent and location of the flood hazard. FIRMs are the most detailed and consistent data source available, and for many communities they represent the minimum area of oversight under their floodplain management program. See Section 4 of Volume 1 for general information on the NFIP.

The City of Vacaville has participated in the NFIP since 1982. The City of Vacaville is currently in good standing with the provisions of the NFIP. Compliance is monitored by FEMA regional staff and by the California Department of Water Resources under a contract with FEMA. Maintaining compliance under the NFIP is an important component of flood risk reduction. See Table 6-11 for more information on the City's policies and historic flood insurance claims.



The City of Vacaville also participates in the NFIP Community Rating System (CRS). The City joined the program in 1995 and maintains a rating of 8. Residents purchasing flood insurance under the NFIP in CRS communities receive discounted premiums based on community actions to reduce flood risks. The CRS rating is based on the amount of flood reduction actions taken in the community.

Table 6-11: NFIP Status Table

NFIP and CRS Status & Information	
City of Vacaville	
NFIP Status	08/02/82
CRS Class	8
Policies in Force	1,136
Policies in SFHA	219
Policies in non-SFHA	917
Total Claims Paid	\$2,480,942
Paid Losses	103
Repetitive Loss Properties	4
Severe Repetitive Loss Properties	-
Repetitive Loss Payment by NFIP on Building	\$234,682
Repetitive Loss Payment by NFIP on Contents	\$76,103

Source: FEMA CIS 2021, OpenFEMA Data, FIMA RUL Solano County

Note: Policies and claims provided directly from FEMA Region IX CIS Report (8/2021). Repetitive loss tabulations by jurisdiction derived via GIS-based intersect of data available at OpenFEMA Data (<https://www.fema.gov/about/openfema/data-sets>). Countywide data reported for entire county area including municipalities. The Privacy Act of 1974 (5 U.S.C. 522a) restricts the release of certain types of data to the public. Flood insurance policy and claims data are included in the list of restricted information. FEMA can only release such data to state and local governments, and only if the data are used for floodplain management, mitigation, or research purposes. Therefore, this plan does not identify the repetitive loss properties or include claims data for any individual property.

See Volume I, Section 4.5 for more information on the NFIP

6.4.3.4 Identify Hazard Problem Statements

As part of the mitigation action identification process, the Planning Committee for each jurisdiction identified areas of concern (aka problem statements) for their respective facilities based on the risk assessment and vulnerability analysis, utilizing the RAMP mapping and static snapshot maps. Problem statements focused on the impact, victim, or threat that the hazard could create in the jurisdiction, as described in Figure 6-18. Identifying common issues and weaknesses through these problem statements assisted the Planning Committee in understanding the realm of resources needed for mitigation. Jurisdiction problem statements are listed in Table 6-12.

The goal is to have at least one mitigation action for every problem statement. Projects or actions have been developed to mitigate each problem identified. See Table 6-17 for a full list of mitigation actions and corresponding problem statements that they address. Each problem statement is coded with a problem number for cross-referencing between Table 6-12 and Table 6-17.

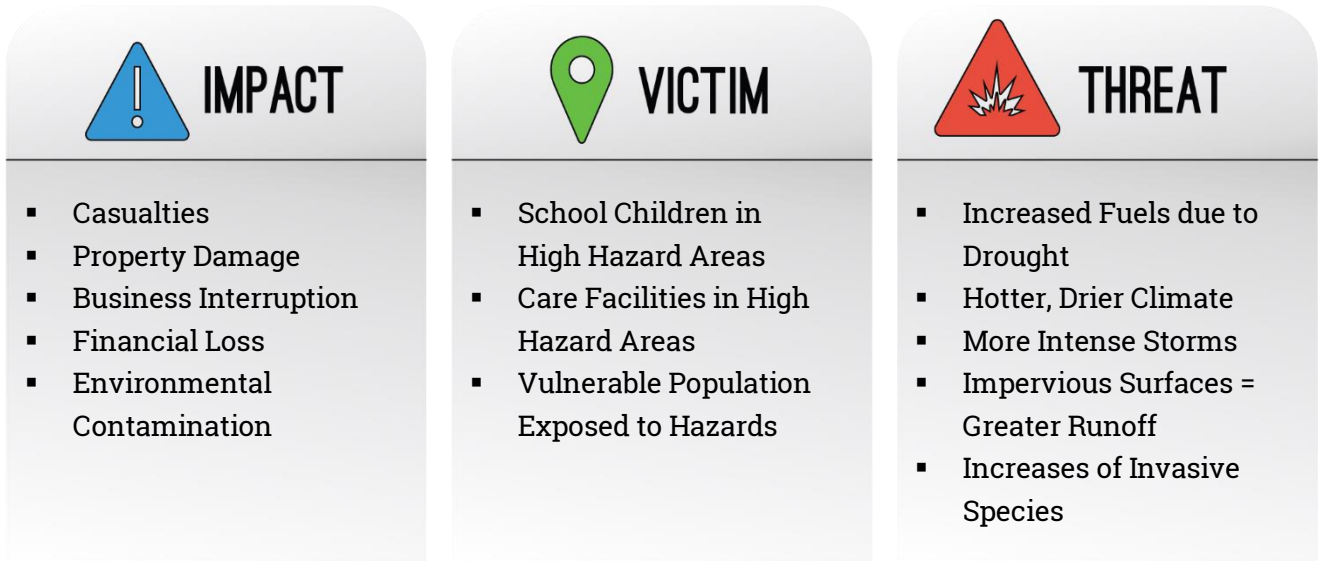


Figure 6-18: Guidance for Problem Statements

Table 6-12: Problem Statements

Problem No.	Hazard Type	Area of Concern	Mitigation Alternatives	Primary Agency	Problem Description	Related MA
ps-AH-VC-103	All Hazard	Impact	ES - Emergency Services	City of Vacaville	City does not have adequate generators for loss of power during mass sheltering event. Generators needed in particular at 3 Oaks Community Center, Duke Center, and the McBride Senior Center	ma-AH-VC-185
ps-AH-VC-104	All Hazard	Impact	ES - Emergency Services	City of Vacaville	City does not have generators at two of its fire stations (No. 72, 73)	ma-AH-VC-185
ps-AH-VC-105	All Hazard	Victim	ES - Emergency Services	City of Vacaville	Loss of power in various hazard events (EQ, high wind, wildfire, high heat, etc) can impact vulnerable populations in City	ma-AH-VC-185
ps-CC-VC-80	Climate Change	Impact	PRV - Prevention, PE&A - Public Education & Awareness	City of Vacaville	City vulnerabilities and opportunities to address climate change haven't been documented in a city-wide climate action plan to date.	ma-CC-VC-189



Problem No.	Hazard Type	Area of Concern	Mitigation Alternatives	Primary Agency	Problem Description	Related MA
ps-CC-VC-81	Climate Change	Impact	PRV - Prevention , PE&A - Public Education & Awareness , NRP - Natural Resource Protection , ES - Emergency Services	City of Vacaville	Climate change will exacerbate the effects of other hazards including wildfire, drought, flood, and extreme weather	ma-CC-VC-189
ps-DR-VC-93	Drought	Impact	PRV - Prevention	City of Vacaville	City continues steps to implement a reclaimed water system, in part to address drought resiliency	ma-DR-VC-56
ps-DR-VC-94	Drought	Victim	PE&A - Public Education & Awareness	City of Vacaville	Public may not be aware of water efficiency and conservation methods to alleviate drought impacts, even while using less water than the base year of 2013 every year with the exception of 2020.	ma-DR-VC-58
ps-DR-VC-95	Drought	Threat	PRV - Prevention , PE&A - Public Education & Awareness	City of Vacaville	City may consider water efficient building, development, and outdoor landscaping that go beyond state standards.	ma-DR-VC-57
ps-EQ-VC-2	Earthquake	Victim	PPRO - Property Protection , SP - Structural Projects	City of Vacaville	Some downtown-area buildings have outdated retrofits or lack retrofits.	ma-WF-VC-55
ps-EQ-VC-3	Earthquake		PRV - Prevention , PPRO - Property Protection	City of Vacaville	Some privately-owned unreinforced masonry buildings in downtown area.	ma-WF-VC-54, ma-WF-VC-53
ps-EW-VC-86	Extreme Weather	Impact	PRV - Prevention , PPRO - Property Protection	City of Vacaville	Due to increasing windstorm intensity, residents have seen increase in power outages from downed trees and limbs.	ma-EW-VC-190
ps-EW-VC-87	Extreme Weather	Impact	PRV - Prevention , PPRO - Property Protection	City of Vacaville	While the City maintains trees to reduce power outages from high wind, many problematic trees are located on private property	ma-EW-VC-190
ps-EW-VC-88	Extreme Weather	Victim	PPRO - Property Protection	City of Vacaville	Residents in Vacaville continue to see flooding from localized rain events, particularly in the Southwood/Tulare neighborhood. Localized flooding has also occurred in Ulatis Creek near Aegean / Allison, Leisure Town, North Alamo, Brown Street, and I80 at Pena Adobe.	ma-FL-VC-41



Problem No.	Hazard Type	Area of Concern	Mitigation Alternatives	Primary Agency	Problem Description	Related MA
ps-EW-VC-89	Extreme Weather	Victim	ES - Emergency Services	City of Vacaville	Residents experience loss of power during extreme weather events.	ma-EW-VC-60
ps-EW-VC-90	Extreme Weather	Victim	ES - Emergency Services	City of Vacaville	Residents continue to need cooling center support from City in high heat events.	ma-HH-VC-62, ma-HH-VC-63
ps-EW-VC-91	Extreme Weather	Threat	PRV - Prevention , NRP - Natural Resource Protection	City of Vacaville	City has impervious surfaces as part of City facilities that contribute to urban heat island effect	ma-EW-VC-61
ps-EW-VC-92	Extreme Weather	Threat	PRV - Prevention , PE&A - Public Education & Awareness	City of Vacaville	Residential and industrial development includes impervious surfaces that contribute to urban heat island effect.	ma-EW-VC-61
ps-FL-VC-4	Flood	Victim	PPRO - Property Protection , NRP - Natural Resource Protection , SP - Structural Projects	City of Vacaville	Flooding continues to affect residents in the S. Wood/ Tulare areas of the City.	ma-FL-VC-41, ma-FL-VC-44, ma-FL-VC-42, ma-FL-VC-46, ma-FL-VC-49, ma-WF-VC-53, ma-FL-VC-199
ps-FL-VC-96	Flood	Impact	PRV - Prevention , NRP - Natural Resource Protection , SP - Structural Projects	City of Vacaville	A number of recreational paths near streams are blocked off due to erosion.	ma-FL-VC-41, ma-FL-VC-192
ps-FL-VC-97	Flood	Threat	PRV - Prevention , NRP - Natural Resource Protection , SP - Structural Projects	City of Vacaville	Streams and waterways are seeing significant erosion throughout the City. One major point of erosion is at a 90 degree bend in Ulatis Creek as it turns to parallel East Main.	ma-FL-VC-192
ps-FL-VC-173	Flood	Victim	PPRO - Property Protection , PE&A - Public Education & Awareness	City of Vacaville	The City has an estimated 8,200 persons and 1,300 parcels, in the FEMA 100-year floodplain.	ma-FL-VC-46, ma-FL-VC-44, ma-FL-VC-49, ma-FL-VC-199
ps-SF-VC-82	Slope Failure	Impact	PRV - Prevention , PPRO - Property Protection	City of Vacaville	City has zones that are more prone to landslide and may require additional mitigation work.	ma-SF-VC-66



Problem No.	Hazard Type	Area of Concern	Mitigation Alternatives	Primary Agency	Problem Description	Related MA
ps-SF-VC-83	Slope Failure	Victim	PPRO - Property Protection , SP - Structural Projects	City of Vacaville	Homeowners in high landslide areas may not have means to implement mitigation efforts.	ma-SF-VC-66
ps-SF-VC-84	Slope Failure	Victim	PPRO - Property Protection , PE&A - Public Education & Awareness , SP - Structural Projects	City of Vacaville	Much of the landslide susceptibility in the City occurs on private property.	ma-SF-VC-66
ps-SF-VC-85	Slope Failure	Threat	PRV - Prevention , NRP - Natural Resource Protection , SP - Structural Projects	City of Vacaville	Recently burned slopes may create landslide or mudslide hazards in the future.	ma-SF-VC-64, ma-SF-VC-65, ma-FL-VC-191
ps-WF-VC-5	Wildfire	Impact	PRV - Prevention , PPRO - Property Protection	City of Vacaville	Additional weed abatement/vegetation removal is needed in key areas of the City. Expanding efforts to include goat and/or sheep grazing would be a more effective approach in some of these areas.	ma-DR-VC-57
ps-EW-VC-98	Wildfire	Impact	PRV - Prevention	City of Vacaville	While more restrictive than state standards, the City's weed abatement ordinance could be revisited and strengthened.	ma-WF-VC-50
ps-WF-VC-99	Wildfire	Impact	ES - Emergency Services	City of Vacaville	Some additional access points may be needed for future access during wildfire events	ma-WF-VC-47, ma-WF-VC-48
ps-WF-VC-100	Wildfire	Impact	PRV - Prevention , NRP - Natural Resource Protection	City of Vacaville	Riparian areas are particularly vulnerable to wildfire because of environmental need for vegetation.	ma-WF-VC-47
ps-WF-VC-101	Wildfire	Victim	PPRO - Property Protection , PE&A - Public Education & Awareness	City of Vacaville	City residents may not know they are in high wildfire zones or how to properly mitigate	ma-DR-VC-57, ma-WF-VC-51
ps-WF-VC-102	Wildfire	Threat	PRV - Prevention , PPRO - Property Protection , NRP - Natural Resource Protection	City of Vacaville	Recently burned slopes may create landslide or mudslide hazards in the future.	ma-WF-VC-47, ma-WF-VC-52, ma-FL-VC-191



Problem No.	Hazard Type	Area of Concern	Mitigation Alternatives	Primary Agency	Problem Description	Related MA
ps-WF-VC-182	Wildfire	Threat	PRV - Prevention, PE&A - Public Education & Awareness	City of Vacaville	Fires can ladder into tree crowns that are touching the ground along City creeks and bike paths; when the trees touch the ground, fires can more easily climb them and then spread to adjacent houses and businesses.	ma-WF-VC-47
ps-WF-VC-184	Wildfire	Threat	PRV - Prevention, PPRO - Property Protection	City of Vacaville	Parts of the city would benefit from permanent defensible space projects to complement the weed abatement program in areas where open space is adjacent to residential and commercial buildings and other infrastructure.	ma-WF-VC-47
ps-WF-VC-185	Wildfire	Threat	PRV - Prevention, NRP - Natural Resource Protection	City of Vacaville	Open space and riparian areas that have tree and shrub growth that has environmental and esthetic value should have enhanced periodic fuel management efforts including limb removal and thinning of trees and shrubbery.	ma-WF-VC-47

6.4.4 Mitigation Action Support Tool (MAST)

As a living document, hazard problem statements and mitigation activities will be updated through a web interface application developed specifically for participating jurisdictions. The Mitigation Action Support Tool (MAST) is accessible through mitigatehazards.com/SolanoHMP/.

MAST is a web-based interactive tool that enables multiple users to search, view, enter, and update mitigation actions, ideas or projects, and other information. MAST provides participating jurisdictions and plan reviewers (Cal OES/FEMA) access to valuable mitigation information that can be leveraged by future planning or other risk reduction efforts within the County. Participating jurisdictions can update the status of their mitigation projects throughout the planning lifecycle, and this web-based tool will improve participating jurisdiction’s ability to apply for FEMA’s Hazard Mitigation Assistance (HMA) grant programs including initial grant application processes through Cal OES.



6.5 Mitigation Strategy

The mitigation strategy is the guidebook to future hazard mitigation administration, capturing the key outcomes of the MJHMP planning process. The mitigation strategy is intended to reduce vulnerabilities outlined in the previous section (a.k.a. problem statements) with a prescription of policies and physical projects. These mitigation actions should be compatible with existing planning mechanisms and should outline specific roles and resources for implementation success.

6.5.1 Capabilities & Adaptive Capacity Assessment

This section examines the planning and regulatory, administrative, technical, financial, educational, and outreach capabilities to augment known issues and weaknesses from identified natural hazards.

Capabilities assessments in this Volume 1 and in Volume 2 include considerations of a community's adaptive capacity for climate change, as outlined in Cal OES' 2020 California Adaptation Planning Guide. Adaptive capacity is a community or region's existing ability to moderate climate change impacts. Assessing adaptive capacity includes analysis of policies, plans, programs, funding, and staffing capacity.

The tables in this section explore various local planning mechanisms, administrative capacity, financial capabilities, and education and outreach initiatives. The columns in each table represent deeper dives into the following questions:

- Is the existing planning or regulatory mechanism used currently? (Column 1, Status)
- Has the HMP been integrated into the planning mechanism currently so that the named mechanism is currently used in HMP planning? (Column 2, Current Mitigation Use)
- Is there a future opportunity to expand, improve upon, and incorporate this 2020 HMP Update into the planning or regulatory mechanism? (Column 3, Future Opportunity)

The capabilities assessment is easily-digestible and based on color coding to indicate which policies and plans are adequate, need improvement or in which the HMP could be integrated. Each table includes a legend that explain how each one of these questions are being answered according to the color indicated: green, yellow, and orange.

For more information on the regulatory environment surrounding each hazard, see hazard-specific sections of Volume 1. Volume 1, Section 5.3.5 includes an extensive list of federal and state funding opportunities as well.



6.5.1.1 Planning and Regulatory Capabilities

Table 6-13: Planning and Regulatory Capabilities

CAPABILITY ASSESSMENT LEGEND		
Status	Current Mitigation Use	Future Opportunity
Currently in use or present.	Used widely for mitigation.	Opportunity to expand and integrate.
(Sort of) Seldomly used or limited presence.	Limited use in mitigation planning.	Limited opportunity to expand and integrate.
(No) Not present or available.	Not used in mitigation planning.	No opportunity to expand or integrate.

Resource	HMP Integration			Notes / Additional Detail
	Status	Current Mitigation Use	Future Opportunity	
Planning and Regulatory Capabilities				
Construction and Future Development Regulations				
Building Codes				2019 California Building Code
Building Code Effectiveness Grading Schedule (BCEGS) Rating				
Public Protection (ISO Class)				Class 5 with score of 56 (2015)
Hazard Related Development Standards				Floodplain Management (14.18); Grading (14.19); Construction & Fire (14.19); New Construction Adjacent to Open Space Lands Where Wildfire is a Threat (14.20.290); Stormwater (14.26); Water Efficient Landscaping (14.27)
Hazard-Specific Ordinance				Weeds and Rubbish Abatement Ordinance (City Code 8.04); Water Conservation (13.20)
Zoning Ordinance				Code update is underway; planned adoption Fall 2021
Growth Management Ordinance				Adopted in 2008. Created 2 new growth areas: East of Leisure Town Road Growth Area and the Northeast Growth Area
Hazard Reduction Programs (Annually Conducted)				
Capital Improvements Program (CIP) or Plan				
Erosion/Sediment Control Program				
Hazard-Related Public Outreach Program				See Education & Outreach Capabilities for more specifics.
Stormwater Management Program (Annual Inspections)				Storm Drainage Master Plan (1996, updated 2001); 2008 Ulatis System Drainage Study by SCWA
Seismic Safety Program (Non-structural Inspections)				



Resource	HMP Integration			Notes / Additional Detail
	Status	Current Mitigation Use	Future Opportunity	
Planning and Regulatory Capabilities				
Earthquake Modernization Program (Building Safety Inspections)	Green	Yellow	Yellow	
Hazard Plans				
General Plan Safety Element	Green	Green	Yellow	2015 General Plan
Noteworthy Area/ Specific Plan with Hazard Focus	Green	Green	Yellow	East of Leisure Town Road Future Specific Plan and the Northeast Area Future Specific Plan contain liquefaction and dam inundation areas
Community Wildfire Protection Plan (CWPP)	Orange	Orange	Green	
Wildfire Vulnerability Assessment	Orange	Orange	Green	
Urban or Integrated Regional Water Management Plan	Green	Yellow	Yellow	2020 Urban Water Management Plan and Urban Water Shortage Contingency Plan (under review 2021)
Floodplain Management Plan	Yellow	Yellow	Yellow	
Stormwater Management Plan	Green	Green	Green	Drainage Management Plan; Storm Drainage Master Plan (1996, updated 2001); 2008 Ulati System Drainage Study by SCWA
Ground Water Management Plan(s)	Yellow	Orange	Yellow	Vacaville Groundwater Sustainability Agency working with other regional agencies to develop Groundwater Sustainability Plan by 2022.
Open Space and Land Management Plan(s)	Green	Yellow	Green	2021 Update. Hazard-related recommendations include: coordinate trail extensions and improvements with flood control projects; Develop management protocols that, at minimum, include controlling invasive species, removing/pruning hazardous trees, minimizing wildfire hazards, controlling river/stream bank erosion, and promoting safe access
Emergency Operations Plan	Green	Yellow	Green	2015-2021 (in process of being updated)
Climate Action Plan, Vulnerability Ass'mt, or Adaptation Plan	Green	Yellow	Green	In 2015, the City adopted the Energy and Conservation Action Strategy (ECAS), or climate action plan; update adoption anticipated June 2021
Sustainable Community Plan (SB 375)	Green	Yellow	Green	In 2015, the City adopted the Energy and Conservation Action Strategy (ECAS), or climate action plan; update adoption anticipated June 2021
Local Delta/ Wetlands Program(s)	Orange	Orange	Yellow	
Downtown Plan with hazard focus	Yellow	Yellow	Yellow	In revision, 2021
Community Health Assessment(s)	Green	Yellow	Yellow	
National Flood Protection Program (NFIP)				
Floodplain Management Regulations	Green	Green	Yellow	Floodplain Management (14.18); Stormwater (14.26)



Resource	HMP Integration			Notes / Additional Detail
	Status	Current Mitigation Use	Future Opportunity	
Planning and Regulatory Capabilities				
Flood Insurance Education and Technical Assist.				Yes, general information and stream gaging
Flood Hazard Mapping / Re-Mapping				2013 Flood Insurance Study
Community Rating System (CRS)				Class 8; Floodplain insurance policy holders in the SFHA currently receive a 10 percent discount on flood insurance premiums, while those not in the SFHA receive a 5 percent premium reduction

6.5.1.2 Administrative and Technical Capabilities

Table 6-14: Administrative and Technical Capabilities

CAPABILITY ASSESSMENT LEGEND		
Status	Current Mitigation Use	Future Opportunity
Currently in use or present.	Used widely for mitigation.	Opportunity to expand and integrate.
(Sort of) Seldomly used or limited presence.	Limited use in mitigation planning.	Limited opportunity to expand and integrate.
(No) Not present or available.	Not used in mitigation planning.	No opportunity to expand or integrate.

Resource	HMP Integration			Notes / Additional Detail
	Status	Current Mitigation Use	Future Opportunity	
Administrative and Technical				
Community Planning and Development Services				
Community Planner				
Civil Engineer				
Building Code Official				
Floodplain Administrator				
Fire Marshall				
Dedicated Public Outreach Personnel				
GIS Specialist and Capability				
Emergency Manager				
Grant Manager, Writer, or Specialist				



Other				
Warning Systems/Services				
General				AlertSolano
Flood				AlertSolano Flood Risk: California Department of Water Resources Flood Risk Notification Program Flood Control: Solano County Water Agency
Wildfire				AlertSolano
Geological Hazards				AlertSolano ShakeAlert.org (nation-wide)

6.5.1.3 Financial Capabilities

Table 6-15: Financial Capabilities

CAPABILITY ASSESSMENT LEGEND		
Status	Current Mitigation Use	Future Opportunity
Currently in use or present.	Used widely for mitigation.	Opportunity to expand and integrate.
(Sort of) Seldomly used or limited presence.	Limited use in mitigation planning.	Limited opportunity to expand and integrate.
(No) Not present or available.	Not used in mitigation planning.	No opportunity to expand or integrate.

Resource	HMP Integration			Notes / Additional Detail
	Status	Current Mitigation Use	Future Opportunity	
Fiscal Capabilities				
Financial Resources for Hazard Mitigation				
Levy for Specific Purposes with Voter Approval				Many of these fiscal capabilities are not expected to be utilized in the future to fund hazard mitigation; thus the opportunity is limited.
Utilities Fees				
Benefit assessments				
System Development Fee				
Various Bonds to Incur Debt				
Stormwater Service Fees				
Capital Improvement Project Funding				



6.5.1.4 Education and Outreach

Table 6-16: Education and Outreach Capabilities

CAPABILITY ASSESSMENT LEGEND		
Status	Current Mitigation Use	Future Opportunity
Currently in use or present.	Used widely for mitigation.	Opportunity to expand and integrate.
(Sort of) Seldomly used or limited presence.	Limited use in mitigation planning.	Limited opportunity to expand and integrate.
(No) Not present or available.	Not used in mitigation planning.	No opportunity to expand or integrate.

Resource	HMP Integration			Notes / Additional Detail
	Status	Current Mitigation Use	Future Opportunity	
Education / Outreach Capabilities				
Education/Outreach Resources				
Website Dedicated to Hazard Topics				Webpages related to general emergency preparedness; drought/ water conservation; at-home wildfire mitigation
Dedicated Social Media				
Hazard Info. Avail. at Library/ Planning Desk				
Annual Public Safety Events				
Ability to Field Public Tech. Assistance Requests				
Public Safety Newsletters or Printed Outreach				
Fire Safe Councils				
Resource Conservation Districts				Solano Resource Conservation District
Other				

6.5.1.5 Capability and Adaptive Capacity Opportunities

The City of Vacaville identified many opportunities for strengthening community capabilities and adaptive capacity. The City considered this assessment in developing its Mitigation Strategy. The City identified additional planning needs for wildfires and community engagement in particular. The City has good outreach capacity currently, and is developing several new plans and projects.

Volume 1, Section 5.3.5 includes an extensive list of federal and state funding opportunities to leverage to improve community capabilities.



6.5.2 Mitigation Actions

Mitigation actions were developed based upon the jurisdiction’s priorities, risk assessment results, and mitigation alternatives. The mitigation action prioritization method used by all participating jurisdictions is described in Section 5.5.1 of Volume 1. Table 6-17 lists each priority mitigation action, responsible party, time frame, potential funding source, implementation steps, and resources need to implement based upon the Planning Committee consensus.

Each participating jurisdiction, including the City of Vacaville, considered ongoing relevancy of mitigation actions from the existing MJHMP and retained or removed such actions while adding new relevant actions as well. Mitigation actions were examined for relevancy and the potential for future implementation and then evaluated for potential follow-up. Some mitigation actions developed during the previous HMP effort were not included because they were an inherent part of the HMP update process or were not detailed enough for implementation at a local Jurisdiction level. the City of Vacaville has made significant changes to other mitigation actions because of the updated risk assessment and implementation strategy, to include more detail, or to update based on current mitigation practices. Volume 1, Section 5.5.2 provides a record of County wide mitigation actions, the status, and additional notes for each action.

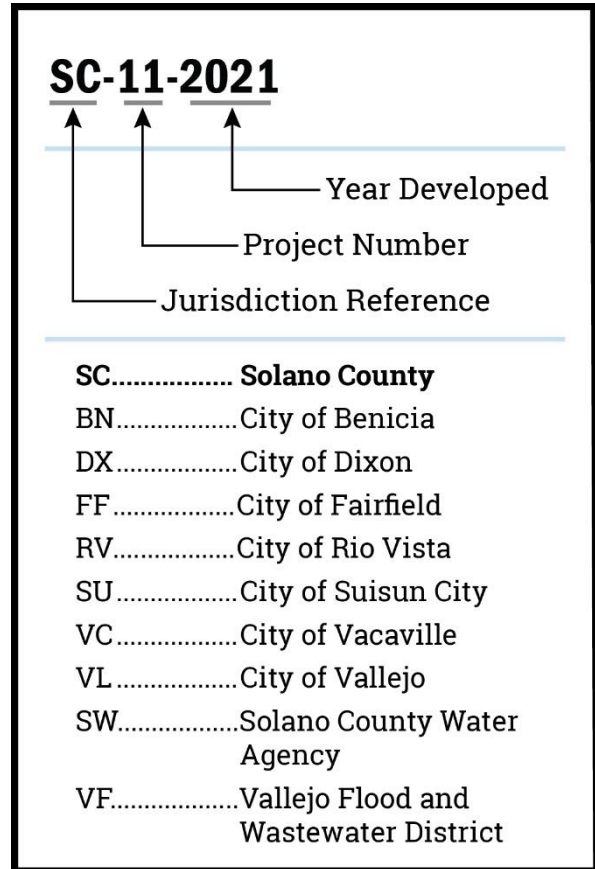


Figure 6-19: Mitigation Action Key

Table 6-17 lists each mitigation action for the City of Vacaville. Each participating jurisdiction developed unique mitigation actions, targeted at their own unique priorities and vulnerabilities. Each mitigation action identifies the responsible party, time frame, potential funding source, implementation steps and resources needed to implement these priority mitigation actions. As a living document, hazard problem statements and mitigation activities will be updated through MAST. The detail in Table 6-17 meets the regulatory requirements of FEMA and DMA 2000.



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Table 6-17: City of Vacaville Mitigation Actions

Mitigation No.	Hazard Type	Mitigation Type	Status	Year	Primary Agency	Title/Description	Responsible Party	Estimated Cost	Estimated Benefit	Time Frame	HMA Activity Type	Potential Grant Source	Priority	Related Goal(s)	Related Problem Statements
ma-FL-VC-49	All Hazard	ES - Emergency Services	Ongoing	2017	City of Vacaville	Provide ample space and/or care for vulnerable populations at evacuation centers.	Community Services American Red Cross	High - Existing funding will not cover the cost of the project; implementation would require new revenue through an alternative source (for example, bonds, grants, and fee increases).	High - Project will provide an immediate reduction of risk exposure for life and property.	Ongoing	N/A	EMPG	Medium	Goal 1: People	ps-FL-VC-4, ps-FL-VC-173
ma-AH-VC-185	All Hazard	ES - Emergency Services	Pending	2021	City of Vacaville	Construct backup generators at critical facilities (fire stations, hospital) and sheltering locations to respond to hazarding events in loss of power.	Public Works; Fire Department	Medium - The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.	High - Project will provide an immediate reduction of risk exposure for life and property.	3-5 Years	Project	HMGP / BRIC , EMPG , Internal Funding	High	Goal 1: People , Goal 2: Infrastructure	ps-AH-VC-103, ps-AH-VC-104, ps-AH-VC-105
ma-FL-VC-191	All Hazard	PPRO - Property Protection	Ongoing	2021	City of Vacaville	Clean out culverts, basins, stormwater and flood channels and drainage structures prior to, during and after large rain events where they cross residential streets, especially downstream of English Hills, Ulatis, and Alamo Creek burn areas from 2020 Hennessey Fire.	Public Works	Medium - The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.	High - Project will provide an immediate reduction of risk exposure for life and property.	Ongoing	N/A	Internal Funding	High	Goal 2: Infrastructure , Goal 4: Resilience	ps-WF-VC-102, ps-SF-VC-85
ma-CC-VC-189	Climate Change	PRV - Prevention	Ongoing	2021	City of Vacaville	Develop a climate action plan; develop adaptation options that minimize climate change impacts and public health hardships. (In progress, expected completion 2021)	Comm Dev	Medium - The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.	High - Project will provide an immediate reduction of risk exposure for life and property.	1-3 Years	Planning	HMGP / BRIC , Internal Funding	High	Goal 1: People , Goal 4: Resilience	ps-CC-VC-80, ps-CC-VC-81
ma-DR-VC-56	Drought	SP - Structural Projects	Pending	2017	City of Vacaville	Continue to implement a reclaimed water system as secondary delivery system.	Utilities Department	High - Existing funding will not cover the cost of the project; implementation would require new revenue through an alternative source (for example, bonds, grants, and fee increases).	High - Project will provide an immediate reduction of risk exposure for life and property.	3-5 Years	Project	HMGP / BRIC	High	Goal 3: Environment , Goal 4: Resilience	ps-DR-VC-93

Mitigation No.	Hazard Type	Mitigation Type	Status	Year	Primary Agency	Title/Description	Responsible Party	Estimated Cost	Estimated Benefit	Time Frame	HMA Activity Type	Potential Grant Source	Priority	Related Goal(s)	Related Problem Statements
ma-DR-VC-57	Drought	NRP - Natural Resource Protection	Ongoing	2017	City of Vacaville	Reduce fire risk by clearing drought-damaged vegetation.	Public Works	Medium - The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.	High - Project will provide an immediate reduction of risk exposure for life and property.	3-5 Years	Project	HMGP / BRIC	High	Goal 1: People , Goal 2: Infrastructure , Goal 3: Environment , Goal 4: Resilience	ps-DR-VC-95, ps-WF-VC-5, ps-WF-VC-101
ma-DR-VC-58	Drought	PRV - Prevention	Pending	2017	City of Vacaville	Strengthen water use ordinances as needed and educate public to such.	Community Dev.; Utilities	Medium - The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.	High - Project will provide an immediate reduction of risk exposure for life and property.	1-3 Years	Planning	HMGP / BRIC	Medium	Goal 3: Environment , Goal 4: Resilience	ps-DR-VC-94
ma-WF-VC-53	Earthquake	PPRO - Property Protection	Ongoing	2017	City of Vacaville	Continue to upgrade and improve city infrastructure to withstand anticipated ground shaking within the city.	Public Works Community Development	High - Existing funding will not cover the cost of the project; implementation would require new revenue through an alternative source (for example, bonds, grants, and fee increases).	High - Project will provide an immediate reduction of risk exposure for life and property.	Funding Dependent	Project	HMGP / BRIC , Internal Funding	Medium	Goal 2: Infrastructure	ps-EQ-VC-3, ps-FL-VC-4
ma-WF-VC-54	Earthquake	PE&A - Public Education & Awareness	Ongoing	2017	City of Vacaville	Improve public education programs and practices to residents for earthquake risk.	PIO, Fire Department, Community Development	Medium - The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.	High - Project will provide an immediate reduction of risk exposure for life and property.	Ongoing	5%	HMGP / BRIC	High	Goal 1: People , Goal 4: Resilience	ps-EQ-VC-3
ma-WF-VC-55	Earthquake	PPRO - Property Protection	Ongoing	2017	City of Vacaville	Explore incentives or cost-sharing programs to facilitate needed retrofits on high occupancy and residences	PIO Community Development	Medium - The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.	Medium - Project will have a long-term impact on the reduction of risk exposure for life and property, or project will not provide an immediate reduction in the risk exposure for property.	1-3 Years	Planning	HMGP / BRIC , Internal Funding	Medium	Goal 1: People , Goal 4: Resilience	ps-EQ-VC-2
ma-EW-VC-60	Extreme Weather	PE&A - Public Education & Awareness	Ongoing	2017	City of Vacaville	Help educate the citizens of Vacaville of ways/programs to reduce electrical demand at commercial and resident's homes during high heat events.	City Manager	Medium - The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.	Medium - Project will have a long-term impact on the reduction of risk exposure for life and property, or project will not provide an immediate reduction in the risk exposure for property.	Ongoing	5%	HMGP / BRIC , Internal Funding	Medium	Goal 4: Resilience	ps-EW-VC-89

Mitigation No.	Hazard Type	Mitigation Type	Status	Year	Primary Agency	Title/Description	Responsible Party	Estimated Cost	Estimated Benefit	Time Frame	HMA Activity Type	Potential Grant Source	Priority	Related Goal(s)	Related Problem Statements
ma-EW-VC-61	Extreme Weather	SP - Structural Projects	Ongoing	2017	City of Vacaville	Maintain and reduce concrete and asphalt infrastructure to mitigate damage from high heat conditions.	Public Works Dept. Community Development	High - Existing funding will not cover the cost of the project; implementation would require new revenue through an alternative source (for example, bonds, grants, and fee increases).	High - Project will provide an immediate reduction of risk exposure for life and property.	3-5 Years	Project	HMGP / BRIC , Internal Funding	High	Goal 2: Infrastructure	ps-EW-VC-91, ps-EW-VC-92
ma-HH-VC-62	Extreme Weather	PE&A - Public Education & Awareness	Ongoing	2017	City of Vacaville	Provide alert, notification and cooling center information to residents during high heat conditions.	PIO Fire Dept.	Low - The project could be funded under the existing budget. The project is part of or can be part of an ongoing existing program.	High - Project will provide an immediate reduction of risk exposure for life and property.	Ongoing	Planning	HMGP / BRIC	High	Goal 1: People	ps-EW-VC-90
ma-HH-VC-63	Extreme Weather	ES - Emergency Services	Pending	2017	City of Vacaville	Provide improved cooling center infrastructure for residents.	Public Works Dept. Community Services	High - Existing funding will not cover the cost of the project; implementation would require new revenue through an alternative source (for example, bonds, grants, and fee increases).	High - Project will provide an immediate reduction of risk exposure for life and property.	Funding Dependent	Project	HMGP / BRIC , EMPG , Internal Funding	High	Goal 1: People , Goal 2: Infrastructure	ps-EW-VC-90
ma-EW-VC-190	Extreme Weather	PPRO - Property Protection	Pending	2021	City of Vacaville	Develop cost share program to help private landowners with tree maintenance to avoid power outages and damage during windstorms.	City Admin/ Pub. Works	High - Existing funding will not cover the cost of the project; implementation would require new revenue through an alternative source (for example, bonds, grants, and fee increases).	High - Project will provide an immediate reduction of risk exposure for life and property.	3-5 Years	Project	HMGP / BRIC	Medium	Goal 1: People , Goal 4: Resilience	ps-EW-VC-86, ps-EW-VC-87
ma-FL-VC-41	Flood	SP - Structural Projects	Ongoing	2017	City of Vacaville	Implement City drainage studies and master plans to improve drainage conveyance, and/or mitigate peak flow in local tributaries. Priorities include Alamo Creek, Ulatis, and N. Horse Creek Basin #2 Detention Projects.	Public Works	High - Existing funding will not cover the cost of the project; implementation would require new revenue through an alternative source (for example, bonds, grants, and fee increases).	High - Project will provide an immediate reduction of risk exposure for life and property.	5-10 Years	Project	HMGP / BRIC	Extreme	Goal 2: Infrastructure , Goal 4: Resilience	ps-FL-VC-4, ps-FL-VC-96, ps-EW-VC-88
ma-FL-VC-42	Flood	ES - Emergency Services	Ongoing	2017	City of Vacaville	Evacuate and shelter populations displaced due to flooding.	Fire Dept.	Medium - The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.	High - Project will provide an immediate reduction of risk exposure for life and property.	1-3 Years	Planning	HMGP / BRIC , CDBG DRI , EMPG	High	Goal 1: People	ps-FL-VC-4

Mitigation No.	Hazard Type	Mitigation Type	Status	Year	Primary Agency	Title/Description	Responsible Party	Estimated Cost	Estimated Benefit	Time Frame	HMA Activity Type	Potential Grant Source	Priority	Related Goal(s)	Related Problem Statements
ma-FL-VC-44	Flood	PRV - Prevention	Ongoing	2017	City of Vacaville	Increase use of technology and the data developed during the preparation of this LHMP to improve upon operational efficiency and effectiveness in maintaining drainage areas.	Public Works	Medium - The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.	High - Project will provide an immediate reduction of risk exposure for life and property.	3-5 Years	Planning	HMGP / BRIC	High	Goal 4: Resilience	ps-FL-VC-4, , ps-FL-VC-173
ma-FL-VC-46	Flood	PRV - Prevention	Ongoing	2017	City of Vacaville	Institute regulatory and educational improvements for increased floodplain protection. These may include: <ul style="list-style-type: none"> - Additional local regulations for manufactured homes. - Changes in zoning ordinance to designate special land uses for floodprone areas - Enhanced subdivision regulations - Additional policies and regulations to enhance the preservation of Open Space in floodprone areas - Development of Policies/standards for addressing 200-year flood protection standard - Provide Certified Floodplain Manager training and certification to staff 	Public Works Building Dept.	High - Existing funding will not cover the cost of the project; implementation would require new revenue through an alternative source (for example, bonds, grants, and fee increases).	High - Project will provide an immediate reduction of risk exposure for life and property.	3-5 Years	Planning	HMGP / BRIC	Medium	Goal 4: Resilience	ps-FL-VC-4, ps-FL-VC-173
ma-FL-VC-192	Flood	NRP - Natural Resource Protection	Pending	2021	City of Vacaville	Assess and implement erosion and flood control options for Ulatis Creek at intersection with Main Street.	Public Works	High - Existing funding will not cover the cost of the project; implementation would require new revenue through an alternative source (for example, bonds, grants, and fee increases).	High - Project will provide an immediate reduction of risk exposure for life and property.	3-5 Years	Planning	HMGP / BRIC , Internal Funding	High	Goal 2: Infrastructure	ps-FL-VC-96, ps-FL-VC-97
ma-FL-VC-199	Flood	PRV - Prevention	Pending	2021	City of Vacaville	Conduct funding and engineering assessment for options to implement Alamo Conveyance Project.	Public Works	High - Existing funding will not cover the cost of the project; implementation would require new revenue through an alternative source (for example, bonds, grants, and fee increases).	High - Project will provide an immediate reduction of risk exposure for life and property.	3-5 Years	Planning	HMGP / BRIC , FMA	Extreme	Goal 2: Infrastructure , Goal 4: Resilience	ps-FL-VC-4, ps-FL-VC-173

Mitigation No.	Hazard Type	Mitigation Type	Status	Year	Primary Agency	Title/Description	Responsible Party	Estimated Cost	Estimated Benefit	Time Frame	HMA Activity Type	Potential Grant Source	Priority	Related Goal(s)	Related Problem Statements
ma-SF-VC-64	Slope Failure	NRP - Natural Resource Protection	Ongoing	2017	City of Vacaville	Replant deep-rooted vegetation on bare slopes of City-owned land, especially focusing on recent burn areas.	Public Works Department	Medium - The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.	High - Project will provide an immediate reduction of risk exposure for life and property.	Ongoing	Project	HMGP / BRIC , Internal Funding	Medium	Goal 1: People , Goal 3: Environment	ps-SF-VC-85
ma-SF-VC-65	Slope Failure	NRP - Natural Resource Protection	Ongoing	2017	City of Vacaville	Continue to perform slope stabilization near landslide/rockslide/mudslide hazard zones, such as I-80.	Public Works Department	High - Existing funding will not cover the cost of the project; implementation would require new revenue through an alternative source (for example, bonds, grants, and fee increases).	High - Project will provide an immediate reduction of risk exposure for life and property.	3-5 Years	Project	HMGP / BRIC	Medium	Goal 1: People , Goal 2: Infrastructure	ps-SF-VC-85
ma-SF-VC-66	Slope Failure	PPRO - Property Protection	Pending	2017	City of Vacaville	Encourage and explore incentive programs for homeowners in high landslide hazard areas to plant native trees and shrubbery; develop cost-share program to offer financial assistance to homeowners.	Community Development	Medium - The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.	High - Project will provide an immediate reduction of risk exposure for life and property.	1-3 Years	Project	HMGP / BRIC	Medium	Goal 1: People , Goal 3: Environment	ps-SF-VC-82, ps-SF-VC-83, ps-SF-VC-84
ma-WF-VC-47	Wildfire	NRP - Natural Resource Protection	Ongoing	2017	City of Vacaville	Increase fuel management and fuel reduction in open space, creeks, around critical facilities, and urban / wildland interface areas. Continue cow grazing and pursue goat grazing as effective fuel management techniques.	Fire Dept.	Medium - The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.	High - Project will provide an immediate reduction of risk exposure for life and property.	1-3 Years	Project	HMGP / BRIC , FP&S , EMPG , Internal Funding	High	Goal 1: People , Goal 2: Infrastructure	ps-WF-VC-99, ps-WF-VC-100, ps-WF-VC-102, ps-WF-VC-182, ps-WF-VC-185, ps-WF-VC-184
ma-WF-VC-48	Wildfire	ES - Emergency Services	Ongoing	2017	City of Vacaville	Maintain and improve access to fire prone areas.	Fire Dept.	High - Existing funding will not cover the cost of the project; implementation would require new revenue through an alternative source (for example, bonds, grants, and fee increases).	High - Project will provide an immediate reduction of risk exposure for life and property.	1-3 Years	Project	HMGP / BRIC , Internal Funding	High	Goal 1: People , Goal 2: Infrastructure	, ps-WF-VC-99
ma-WF-VC-50	Wildfire	PRV - Prevention	Pending	2017	City of Vacaville	Evaluate and modify as needed weed abatement policies and enforcement throughout City.	Fire Dept.	Medium - The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.	High - Project will provide an immediate reduction of risk exposure for life and property.	1-3 Years	Planning	HMGP / BRIC , Internal Funding	High	Goal 3: Environment , Goal 4: Resilience	ps-EW-VC-98



Mitigation No.	Hazard Type	Mitigation Type	Status	Year	Primary Agency	Title/Description	Responsible Party	Estimated Cost	Estimated Benefit	Time Frame	HMA Activity Type	Potential Grant Source	Priority	Related Goal(s)	Related Problem Statements
ma-WF-VC-51	Wildfire	PE&A - Public Education & Awareness	Ongoing	2017	City of Vacaville	Develop public education for wildfire risks and mitigation in areas of extreme fire danger.	Public Information Officer, Fire Department	Medium - The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.	High - Project will provide an immediate reduction of risk exposure for life and property.	Ongoing	5%	HMGP / BRIC , Internal Funding	Extreme	Goal 1: People , Goal 4: Resilience	ps-WF-VC-101
ma-WF-VC-52	Wildfire	NRP - Natural Resource Protection	Ongoing	2017	City of Vacaville	Repair burned sloped; landslides/ mudslides/slope stabilization after a fire.	Public Works	High - Existing funding will not cover the cost of the project; implementation would require new revenue through an alternative source (for example, bonds, grants, and fee increases).	High - Project will provide an immediate reduction of risk exposure for life and property.	3-5 Years	Project	HMGP / BRIC	Extreme	Goal 4: Resilience	ps-WF-VC-102

SECTION 7

JURISDICTIONAL ANNEX:

City of Vallejo



SOLANO COUNTY

MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

[BACK TO ANNEX TABLE OF CONTENTS](#)

FINAL for adoption



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Solano County
Multi-Jurisdiction Hazard Mitigation Plan
CITY OF Vallejo (VL.)
Municipal Annex

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Adoption Resolution

To comply with DMA 2000, the City of Vallejo has officially adopted this Solano County Multi-Jurisdictional Hazard Mitigation Plan (MJHMP), Volume 1, and its jurisdictional annex. The adoption of the MJHMP recognizes the City’s commitment to reducing the impacts of natural hazards. See included adoption resolution.

RESOLUTION NO. 22-059 N.C.

**ADOPTING THE SOLANO COUNTY MULTI-JURISDICTION
HAZARDOUS MITIGATION PLAN**

WHEREAS, the City of Vallejo (“City”) is an official participating jurisdiction in the Solano County Multi-Jurisdiction Hazard Mitigation Plan (“MJHMP”); and

WHEREAS, the City recognizes the MJHMP as the official hazard mitigation plan for participating jurisdictions; and

WHEREAS, the City has gathered information and prepared the MJHMP in accordance with Federal Emergency Management Agency (FEMA) requirements at 44 CFR § 201.6; and

WHEREAS, Volume 1 of the MJHMP recognizes the threat that natural hazards pose to people and property throughout Solano County; and

WHEREAS, the City’s Annex to Volume 1 of the MJHMP provides additional information specific to the City with a focus on providing additional details on the planning process, risk assessment, and mitigation strategy for this community; and

WHEREAS, the City has reviewed Volume 1 of the MJHMP and its Annex and affirms that the plan actions in Volume 1 and its Annex should reduce the potential for harm to people and property from future hazard occurrences within the community; and

WHEREAS, the Disaster Mitigation Act of 2000 (the “Act”) emphasizes the need for pre-disaster mitigation of potential hazards; and

WHEREAS, the Act makes available mitigation grants to state and local governments; and

WHEREAS, an adopted hazard mitigation plan is required as a condition of future funding for mitigation projects under multiple FEMA pre- and post-disaster mitigation grant programs; and

WHEREAS, the City fully participated in the FEMA-prescribed mitigation planning process to prepare this MJHMP; and

WHEREAS, the residents were afforded opportunities to comment and provide input in the MJHMP and the mitigation actions in the Plan; and

WHEREAS, the City, as a fully participating jurisdiction of the MJHMP, is an eligible sub-applicant to the State of California under FEMA’s hazard mitigation grant program guidance; and

WHEREAS, the California Office of Emergency Services (Cal OES), and the FEMA Region IX officials have reviewed the MJHMP and have approved it contingent upon this official adoption by the participating governing body; and

WHEREAS, the City desires to comply with the requirements of the Act and to augment its emergency planning efforts by formally adopting the MJHMP; and

WHEREAS, adoption by the City Council demonstrates the jurisdiction's commitment to fulfilling the mitigation goals and objectives outlined in this MJHMP; and

WHEREAS, adoption of this plan helps to coordinate the responsible agencies to carry out their responsibilities under the MJHMP.

NOW, THEREFORE, BE IT RESOLVED that the City Council of the City of Vallejo does hereby resolve as follows:

Section 1. The Recitals set forth above are true and correct and are incorporated into this Resolution by reference.

Section 2. The City Council has jurisdiction to consider, approve, and adopt the subject of this Resolution.

Section 3. The City Council hereby adopts the Solano County Multi-Jurisdictional Hazard Mitigation Plan Volume 1 and its Annex, as approved by FEMA and the California Office of Emergency Services, as the official mitigation plan for the City of Vallejo.

Section 4. The City Council hereby authorizes the County of Solano Emergency Services Manager to submit an approved and signed copy of this Resolution to the California Office of Emergency Services and to FEMA Region IX officials for the plan's final approval in accordance with the requirements of the Disaster Mitigation Act of 2000.

Adopted by the City Council of the City of Vallejo at a regular meeting held on March 22, 2022 with the following vote:

AYES: Mayor McConnell, Vice Mayor Verder-Aliga, Councilmembers Arriola, Brown, Dew, Loera-Diaz and Miessner
NOES: None
ABSENT: None
ABSTAIN: None

DocuSigned by:

FDED3EAE23444F...
ROBERT H. MCCONNELL, MAYOR

ATTEST:

DocuSigned by:

1489DDA6695D423...
DAWN G. ABRAHAMSON, CITY CLERK



Section 7. City of Vallejo

7.1 Purpose

This Annex details the hazard mitigation planning elements specific to the City of Vallejo. This Annex is not intended to be a standalone document but appends to and supplements the information contained in the umbrella plan document. As such, all sections of the umbrella plan, including the planning process and other procedural requirements apply to and were met by the City of Vallejo. This Annex provides additional information specific to the City of Vallejo, with a focus on providing additional details on the planning process, risk assessment, and mitigation strategy for this community.

Hazard Mitigation Plan Points of Contact

Primary Point of Contact

Terrance Davis, Public Works Director
City of Vallejo
555 Santa Clara St,
Vallejo, CA 94590
Telephone: 707-648-4316
e-mail: terrance.davis@cityofvallejo.net

Alternate Point of Contact

Armond Sarkis, Risk Manager
City of Vallejo
555 Santa Clara St,
Vallejo, CA 94590
Telephone: 707-648-4143
e-mail: armond.sarkis@cityofvallejo.net

7.2 Planning Methodology

The City of Vallejo followed the planning process detailed in Volume 1, Section 3, including participating in the County Hazard Mitigation Planning Committee (HMPC) and Steering Committee and formulating their own internal planning team to support the broader planning process. Internal planning participants, their positions, and how they participated in the planning process are shown in Table 7-1.

Table 7-1: Planning Committee Members

Planning Committee Members	Department
Terrance Davis	Public Works Director
Armond Sarkis	Risk Manager
Ben Smith	Risk Analyst
Byron Berhel	Emergency Manager
Christina Ratcliffe	Planning Manager
Margaret Kavanaugh- Lynch	Planning Manager
Melissa Cansdale	Associate Engineer
Sal Nuno	Maintenance Superintendent
Addison LeBlanc	Assistant Engineer
Cathy Carpenter	Engineering Technician

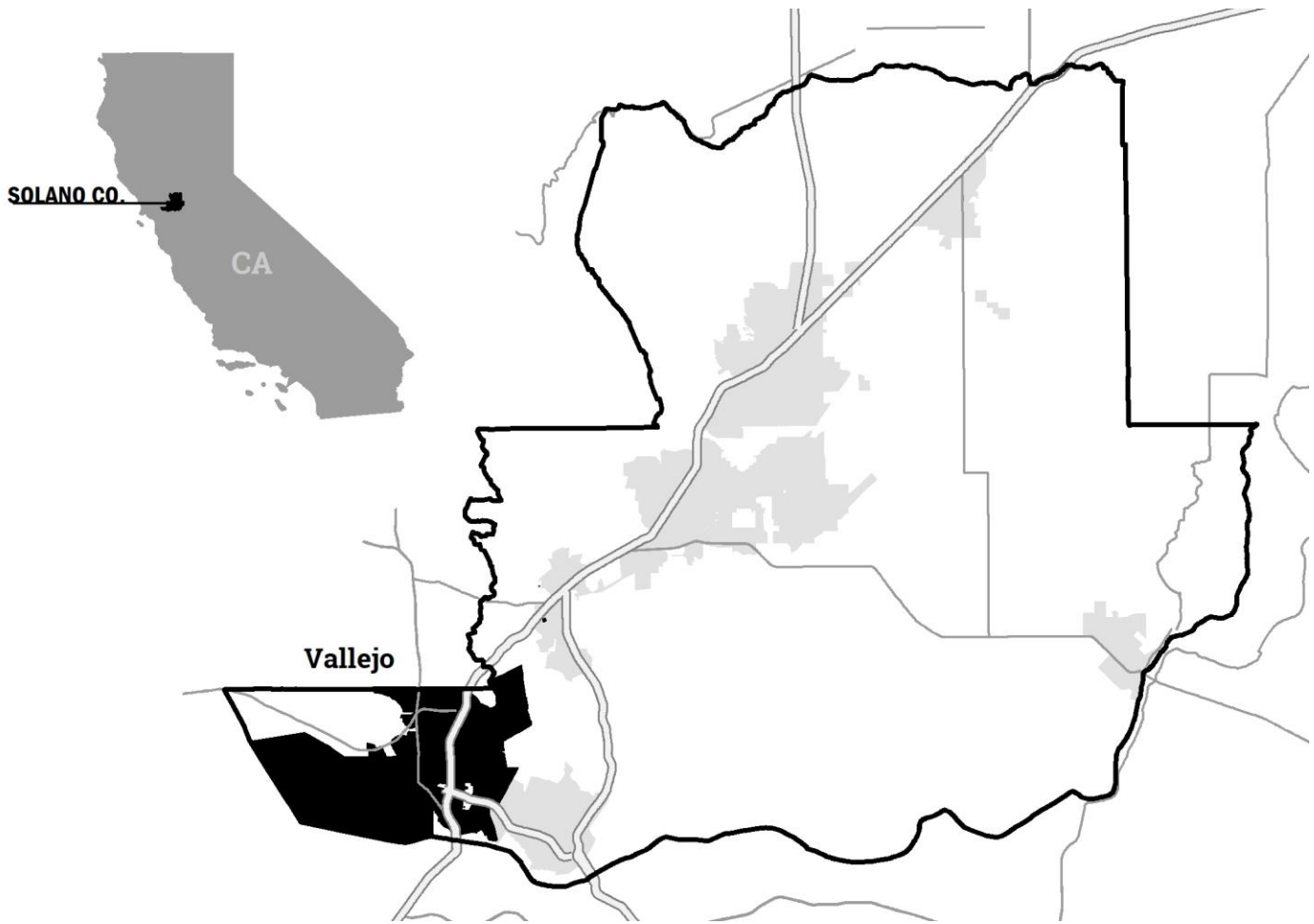


Figure 7-1: City of Vallejo Location

7.3 What's New

The City of Vallejo has not had a hazard mitigation plan since participating in the 2006 Association of Bay Area Governments MJHMP. Because the City's annex to the ABAG Plan is outdated, the Planning Committee elected to not include any of the mitigation actions from the earlier plan in this MJHMP. Starting fresh will ensure that the City's mitigation strategy addresses its most pressing current vulnerabilities. The City's efforts to incorporate hazard mitigation into other planning mechanisms are documented in Section 1.5.1, the Capabilities Assessment.



7.4 Risk Assessment

The intent of this section is to profile the City of Vallejo's hazards and assess the City's vulnerabilities, distinct from that of the County wide planning area. The hazard profiles in Volume 1 discuss overall impacts to the planning area and describes the hazard problem description, hazard extent, magnitude/severity, previous occurrences of hazard events and the likelihood of future occurrences. For more information on Risk Assessment Methodologies, see Vol. 1 and Appendix A.

7.4.1 Hazard Screening Criteria

Planning Team members from each participating jurisdiction collectively discussed which hazards should be profiled in the Plan and which should not. The results of that discussion can be found in Table 7-2. Detailed hazard profiles of the most significant County wide hazards are described in Section 4 of Volume 1. The Planning Team reviewed previously-prepared hazard mitigation plans and other relevant documents to determine the realm of natural hazards that have the potential to affect the City of Vallejo. Table 7-3 provides a crosswalk of hazards identified in Vol. 1 of this plan, the City of Vallejo General Plan, and 2018 California State Hazard Mitigation Plan. The crosswalk was used to develop a preliminary hazards list, providing a framework for the Planning Team members to evaluate which hazards were truly relevant to the City of Vallejo and which ones were not. Section 0 below describes the hazard risk ranking process that was performed by the planning team which prioritized hazards that are specifically relevant to the City of Vallejo.



Table 7-2: County-Wide Hazard Prioritization

Hazard Type	Explanation
Climate Change	High priority county-wide, profiled hazard.
Dam/ Levee failure	Dam failure is possible in Solano County but is best addressed in other plans, specifically Emergency Action Plans for high hazard dams affecting Solano County.
Drought	High priority county-wide, profiled hazard.
Earthquake/ Geologic Hazards	High priority county-wide, profiled hazard.
Flood	High priority county-wide, profiled hazard.
Hazardous Material	While hazardous materials can release and impact the County, there are better avenues to address this hazard outside this plan.
High Winds/ Straight Line Winds	High priority county-wide, profiled as part of Extreme Weather.
Insect Hazards	While hazardous insects exist in Solano County, this was not considered a priority and is not profiled in this plan.
Pandemic Disease	While pandemic disease can impact the County, there are better avenues to address this hazard outside this plan.
Extreme Weather, including:	High priority county-wide for high wind, heavy rain, and high heat.
Extreme Heat	Profiled as part of Extreme Weather.
Hail	Hail events are rare and not considered a priority.
High Wind	Profiled as part of Extreme Weather.
Heavy Rain	Profiled as part of Extreme Weather.
Fog	Fog events are rare and are not considered a priority.
Lightning	Not a priority as an extreme weather event; discussed as source of wildfire.
Severe Thunderstorm	Severe thunderstorms were not identified as a priority in this plan.
Winter Storm / Extreme Cold/ Freeze Events	Winter storms are rare in Solano County and not identified as a priority for this plan.
Slope Failure	High priority county-wide, profiled hazard.
Soil Hazards	While limited soil hazards exist in Solano County (erosion and shifting soils), these are not prioritized in this plan. Erosion discussed under flood hazard.
Terrorism/Human Caused Threats	While terrorism is certainly a threat to the County and participating jurisdictions, it is best addressed in other plans as this HMP does not address human-caused threats.
Tornado	Impacts to the County from tornados are extremely unlikely, if any.
Volcanic Activity	Due to distance from volcanoes and the limited chance of an eruption, this hazard was not identified as a priority.
Wildfire	High priority county-wide, profiled hazard.



Table 7-3: City Document Review Crosswalk

Hazards	2014 Vallejo General Plan	2014 Solano County HMP	2018 California State HMP
Agricultural Pests			■
Climate Change	■	■	■
Dam Failure	■	■	■
Drought	■	■	■
Earthquake	■	■	■
Extreme Weather		■	■
Flood	■	■	■
Landslide	■	■	■
Levee Failure	■		■
Manmade Hazards	■		■
Pandemic Disease			■
Sea Level Rise	■	■	■
Soil Hazards	■		■
Terrorism & Tech Hazards			■
Tsunami			■
Volcano			■
Wildfire	■	■	■

7.4.2 Hazard Risk Ranking

The City of Vallejo’s Planning Team used the same hazard prioritization process as the Solano County Hazard Mitigation Planning Committee. This process is described in detail in Section 4.3.1 of Vol. 1. Figure 7-2 displays the results of the hazard risk ranking exercise that was performed by the Planning Team. The Planning Team chose to assess the City of Vallejo’s vulnerability to the following hazards:

- Wildfire
- Earthquake
- Extreme Weather (heavy rain, high wind)
- Drought
- Climate Change

All of these hazards have been profiled in Vol. 1 of this document. The purpose of this annex to specifically address the City of Vallejo’s vulnerability to these specifically-identified hazards.

7.4.3 Vulnerability Assessment

Assessing vulnerabilities exposes the unique characteristics of individual hazards and begins the process of narrowing down which areas within the City of Vallejo are vulnerable to specific hazard events. The vulnerability assessment considered unique local knowledge of hazards and impacts and a GIS overlaying method for examining such vulnerabilities more in depth. Using these methods, participating jurisdictions estimated vulnerable populations, infrastructure, and potential losses from hazards.



7.4.3.1 Risk Assessment

Each participating jurisdiction developed a risk matrix that assessed the probability and impact of various hazards within the jurisdiction. Figure 7-2 is the jurisdiction's risk assessment, which was completed in part using the web based and interactive Risk Assessment Mapping Platform (RAMP), accessed via the project website at www.mitigatehazards.com. RAMP allows interactive discovery of robust risk, vulnerability, and exposure data developed especially for Solano County. RAMP is a mapping platform built specifically for mitigation planning. It displays County/jurisdiction facilities and buildings overlaid with natural hazards layers to bring interactivity and individual discovery to the GIS analysis performed for the MJHMP. See Vol. 1 for a detailed description of RAMP. The Planning Team used RAMP in meetings and as needed to understand vulnerabilities to the City of Vallejo. Users interactively filter facilities and buildings by natural hazard zones and/or construction characteristics. The City of Vallejo also conducted a more detailed climate vulnerability assessment, included as Appendix A to this annex. The climate vulnerability assessment analyzed climate-related vulnerabilities by considering the impact from the climate vulnerability and the community's adaptive capacity to respond to the particular vulnerability.

7.4.3.2 Snapshot Exposure Maps & Damage Estimation

The included snapshot maps and damage estimation tables illustrate the City of Vallejo's vulnerability to specific hazards. Based on the risk assessment, the snapshot maps focus on those hazards prioritized by the jurisdiction. These maps helped the Planning Team understand the exposure of population, parcels, and critical infrastructure to specific hazards. Each map contains an exposure summary that displays the percent of the population, the improvement and content value of parcels, and the amount of critical infrastructure that is exposed to each respective hazard. For flood and earthquake, detailed damage estimations were conducted through FEMA's Hazus software and are shown in tabular form. Additional mapping is also included. Figures and tables include:

- Figure 7-3: City of Vallejo– Mean Fire Return Interval
- Figure 7-4: City of Vallejo– Wildfire Risk Exposure
- Figure 7-5: City of Vallejo– Concord Green Valley EQ Scenario (M6.8)
- Table 7-4: City of Vallejo–Concord Green Valley (M6.8) Damage Estimate Summaries
- Table 7-5: City of Vallejo–Hayward Rodger's Creek (M7.1) Damage Estimate Summaries
- Figure 7-6: City of Vallejo– Hayward Rodger's Creek EQ Scenario (M7.1)
- Figure 7-7: City of Vallejo– Areas with Potential for Liquefaction
- Figure 7-8: City of Vallejo– Average Annual Precipitation (1981-2010. Inches)
- Figure 7-10: City of Vallejo– Annual Average Wind Speed (Power Class)
- Figure 7-9: City of Vallejo– BAM 200-YR Flooding and Awareness Zones
 - Flood not a prioritized hazard. Map included as part of Safety Element compliance.
- Figure 7-11: City of Vallejo– Drought Severity Timeline -San Pablo Bay
- Figure 7-12: City of Vallejo – RCP Comparison
- Figure 7-13: City of Vallejo– Sea Level Rise Exposure



Risk Assessment Matrix Definitions

PROBABILITY RATING

The likelihood of a hazard event occurring within a time period?

PROBABILITY	Highly Likely	Highly likely - 100% annual probability. Or likely to occur every year in your lifetime.
	Likely	Likely - Between 10 and 100% annual probability. Or will occur several times in your lifetime.
	Possible	Possible - Between 1 and 10% annual probability. Or likely to occur some time in your lifetime.
	Unlikely	Unlikely - Less than 1% annual probability. Or unlikely but possible to occur in your lifetime.

IMPACT RATING

In terms of injuries, damage, or death, would you anticipate impacts to be minor, limited, critical, or catastrophic when a significant hazard event occurs? The impact could be in terms of one hazard event (flooding from a culvert failure) or a large-scale event (multiple rivers flooding) in the same jurisdictional boundary.

IMPACT			
Minor	Limited	Critical	Catastrophic

Minor - Very few injuries, if any. Only minor property damage and minimal disruption on quality of life. Temporary shutdown of critical facilities.

Limited - Minor injuries only. Approx. 10% or less of property in disaster footprint damaged or destroyed. Complete shutdown of critical facilities for more than one day.

Critical - Multiple deaths/injuries possible. Between 25% and 50% of property in disaster footprint is damaged or destroyed. Complete shutdown of critical facilities for more than one week.

Catastrophic - High number of deaths/injuries possible. More than 50% of property in affected area damaged or destroyed. Complete shutdown of critical facilities for 30 days or more.

To concentrate resources on highest priority hazards, the jurisdictional planning team will focus on "High" and "Extreme" risk hazards in this annex. These hazards have higher probability and greater impact as it relates to the jurisdiction's planning area.

Hazard definitions are included in Vol. 1 of this plan.

Hazard Information / Legend:



Climate Change is prioritized for all jurisdictions.

Sea-Level Rise is a subhazard of climate change for some jurisdictions (County, Vallejo, Benicia, Suisun City, Fairfield).



Extreme Weather in Solano County includes high heat, high wind, and heavy rain.

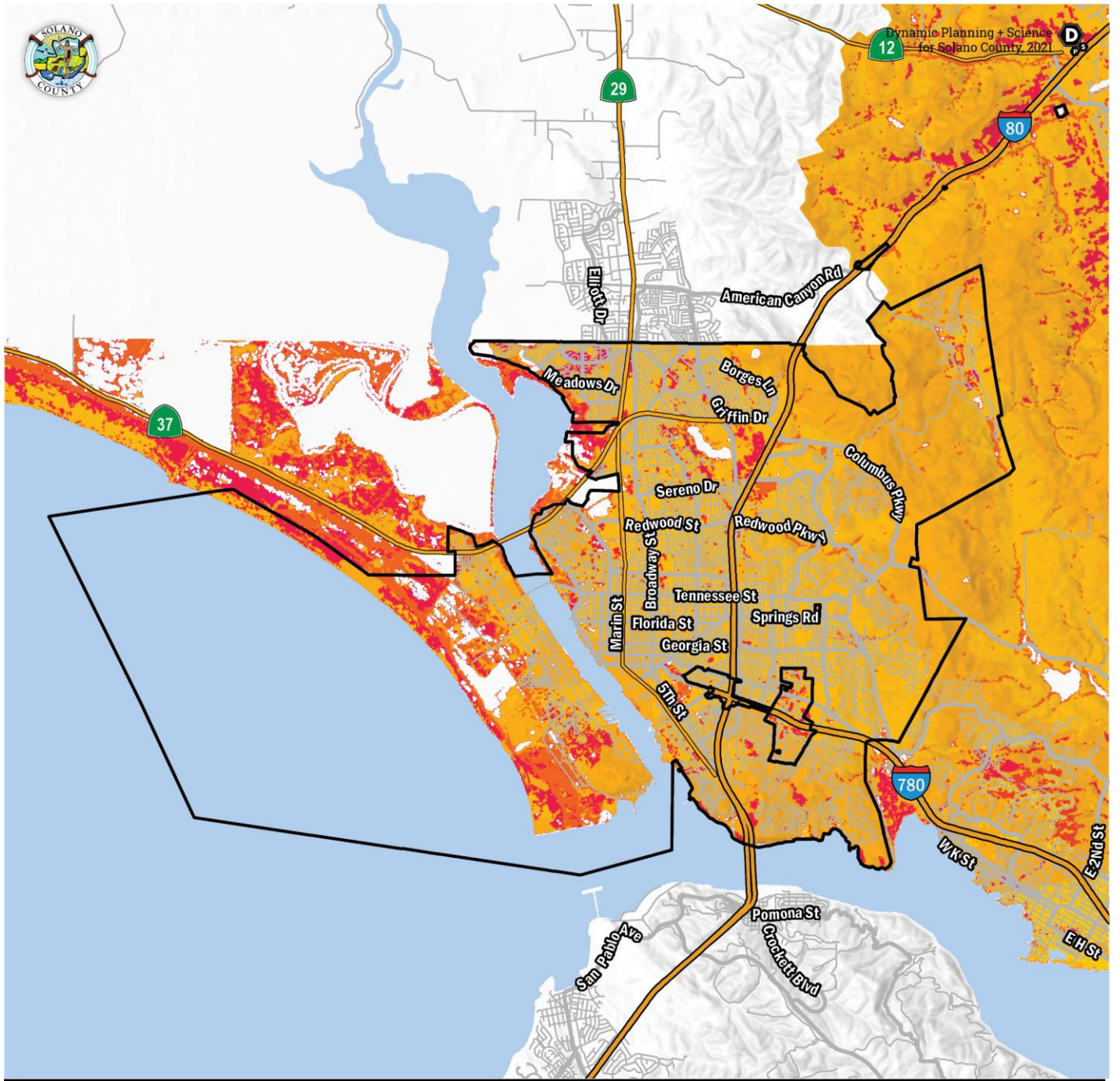


If a hazard symbol is grey, the planning team did not develop hazard vulnerability information due to lower perceived probability and impact.

City Of Vallejo Risk Matrix

		IMPACT			
		Minor	Limited	Critical	Catastrophic
PROBABILITY	Highly Likely	Medium	High	Extreme	Extreme
	Likely	Medium		High	Extreme
	Possible	Low			High
	Unlikely	Low	Low	Medium	Medium

Figure 7-2: City of Vallejo Risk Assessment



MEAN FIRE RETURN INTERVAL VALLEJO

*Data sources: USGS LANDFIRE.

AVERAGE PERIOD BETWEEN FIRES (YEARS)

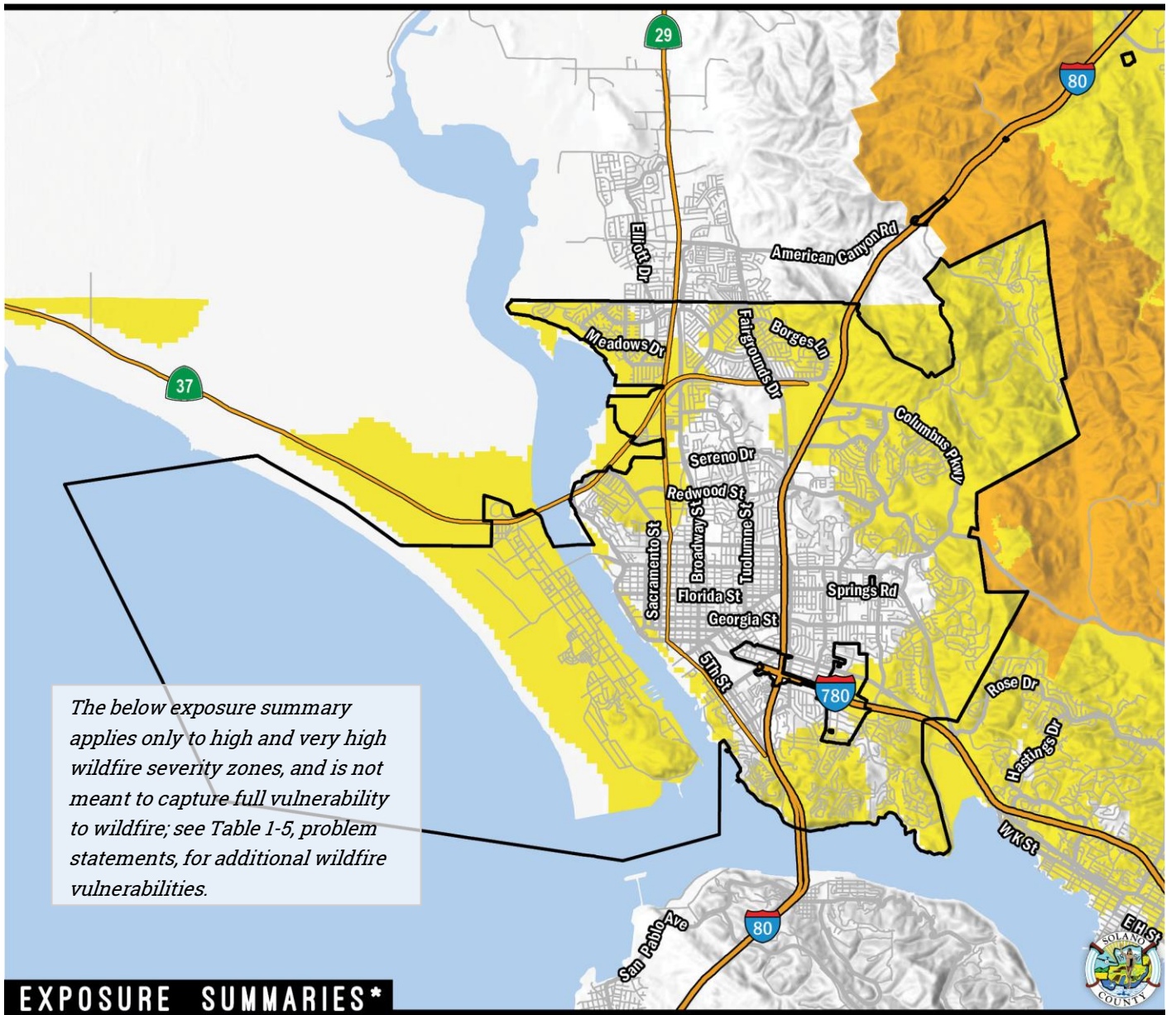


Figure 7-3: City of Vallejo– Mean Fire Return Interval



WILDFIRE RISK EXPOSURE

VALLEJO



The below exposure summary applies only to high and very high wildfire severity zones, and is not meant to capture full vulnerability to wildfire; see Table 1-5, problem statements, for additional wildfire vulnerabilities.

EXPOSURE SUMMARIES*

POPULATION COUNT IN HAZARD AREA	
Count	Exp. Rate**
16	0%
Count Includes: ■ ■ ■	

PARCEL COUNT IN HAZARD AREA	
Count	Exp. Rate**
0	0%
Count Includes: ■ ■ ■	

PARCEL VALUE IN HAZARD AREA	
Sum of Improvement Value	Exp. Rate**
\$0	0%
Sum of Content Value	
\$0	0%
Count Includes: ■ ■ ■	

CRITICAL INFRASTRUCTURE COUNTS IN HAZARD AREA			
Infrastructure Category	Count	Exp. Rate**	Count/Sum Includes:
Essential Facilities	0	0%	■ ■ ■
High Potential Loss	4	1%	Sum of Transportation & Lifeline Linear Mileage
Transportation & Lifeline	0	0%	

MAP LEGEND

- MODERATE
- HIGH (H)
- VERY HIGH (VH)

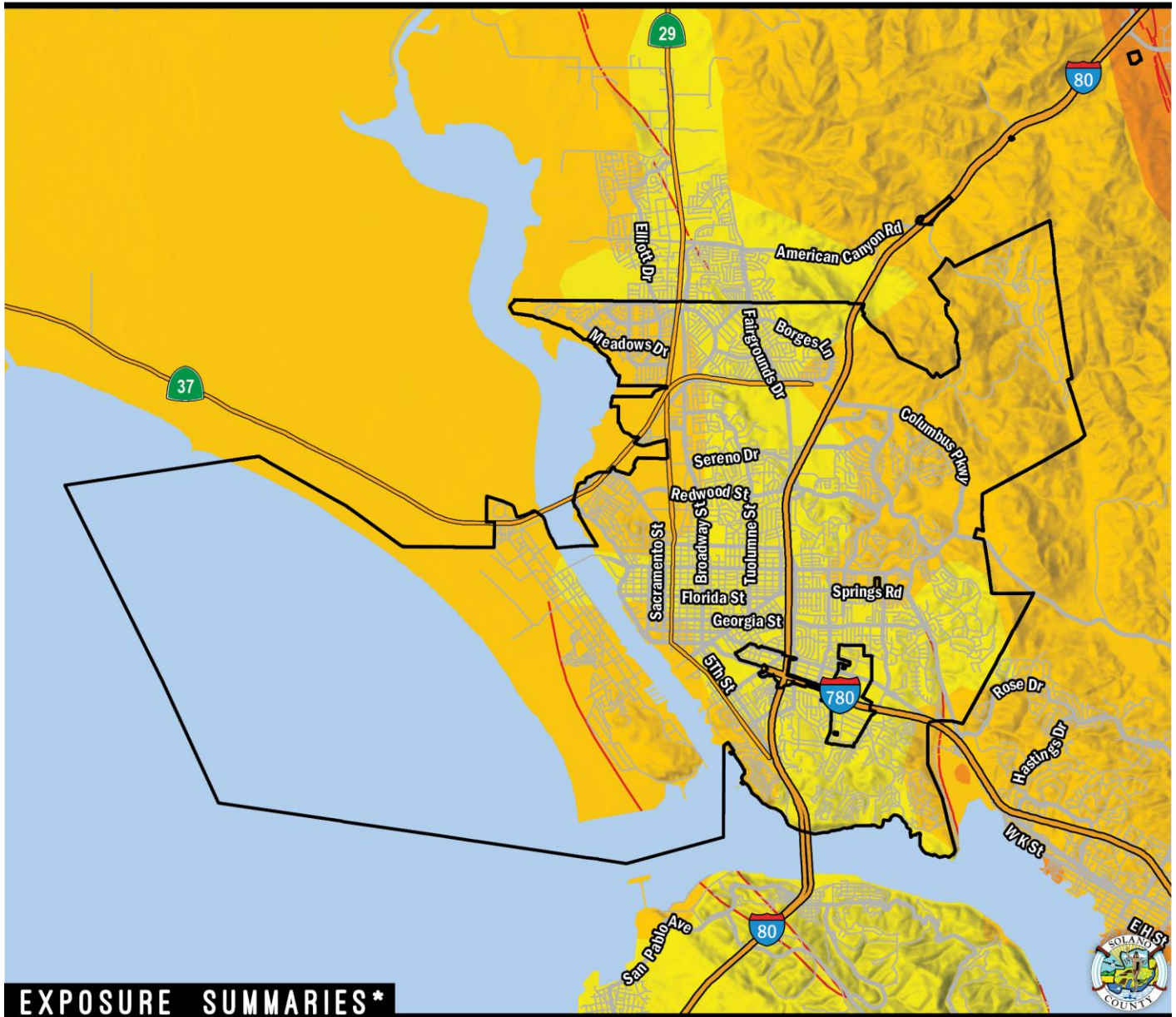
*Exposure summaries include high and very high risk areas. Hazard data source: Cal Fire, CPUC.
 **Exposure Rate - Exposed summary or count as a percentage of total summary or count within jurisdiction.
 Dynamic Planning + Science for Solano County, 2021

Figure 7-4: City of Vallejo– Wildfire Risk Exposure



CONCORD-GREEN VALLEY EARTHQUAKE SCENARIO (M6.8)

VALLEJO



EXPOSURE SUMMARIES*

POPULATION COUNT IN HAZARD AREA

Count	Exp. Rate**
120,977	100%
Count Includes: S+++E	

PARCEL COUNT IN HAZARD AREA

Count	Exp. Rate**
35,405	100%
Count Includes: S+++E	

PARCEL VALUE IN HAZARD AREA

Sum of Improvement Value	Exp. Rate**
\$16,580,539,022	100%
Sum of Content Value	Exp. Rate**
\$9,779,451,188	100%
Count Includes: S+++E	

CRITICAL INFRASTRUCTURE COUNTS IN HAZARD AREA

Infrastructure Category	Count	Exp. Rate**	Count/Sum Includes:
Essential Facilities	17	100%	S+++E
High Potential Loss	541	100%	Sum of Transportation & Lifeline Linear Mileage
Transportation & Lifeline	943	100%	724 100%

MAP LEGEND

III	IV	V	VI	VII	VIII	IX	X
WEAK	LIGHT	MODERATE	STRONG	VERY STRONG	SEVERE	VIOLENT	EXTREME
MMI							

*Exposure summaries include strong, very strong, violent, and severe MMI classes. Hazard data source: USGS.

**Exposure Rate - Exposed summary or count as a percentage of total summary or count within jurisdiction.

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Figure 7-5: City of Vallejo– Concord Green Valley EQ Scenario (M6.8)



Table 7-4: City of Vallejo—Concord Green Valley (M6.8) Damage Estimate Summaries

Building Type	Average of Potential Damage to Exceed "Slight"	Average of Potential Damage to Exceed "Moderate"	Average of Potential Damage to Exceed "Extensive"	Average Economic Loss for Each Building Category	Sum of Economic Loss	Proportion of Loss (%)
Agriculture	0%	0%	0%	\$0	\$0	0%
Commercial	30%	10%	2%	\$155,841	\$145,866,860	17%
Education*	45%	24%	5%	\$588,511	\$5,296,597	1%
Emergency	34%	13%	3%	\$177,548	\$3,906,059	0%
Government	28%	9%	1%	\$216,927	\$25,814,368	3%
Industrial	47%	26%	6%	\$230,672	\$37,368,842	4%
Religion	26%	6%	0%	\$52,793	\$6,335,198	1%
Residential	28%	5%	0%	\$18,164	\$620,581,257	73%
Total					\$845,169,181	

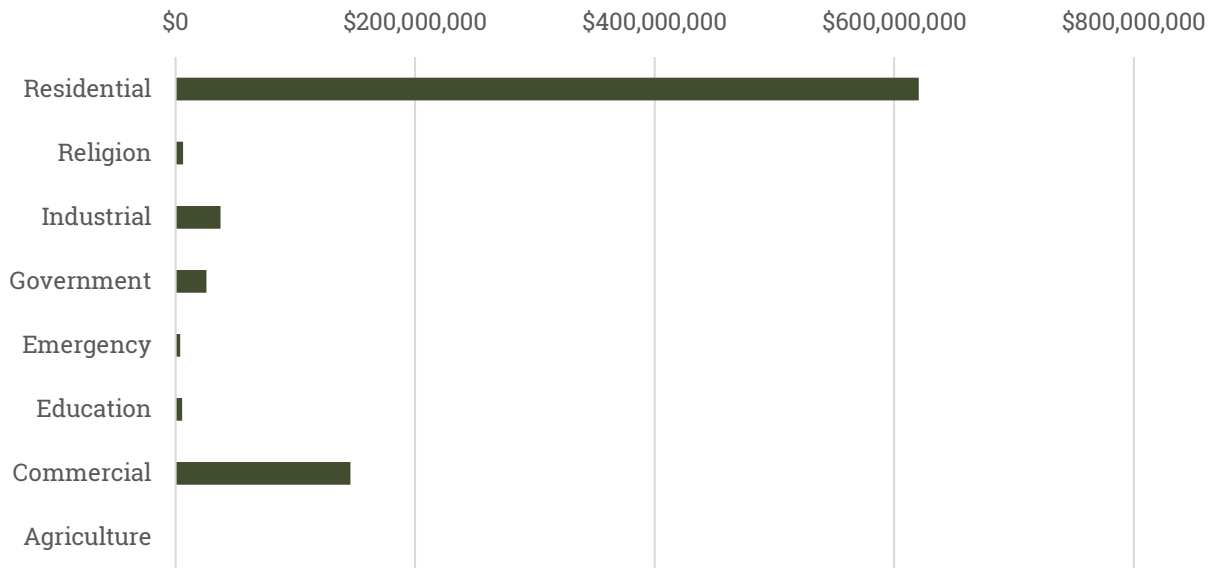
*School district asset information not available during time of Hazus analysis.

Note: Total Inventory Values

1 - Building Replacement Costs = \$3,773,922,295

2 - Content Replacement Costs = \$2,667,166,517

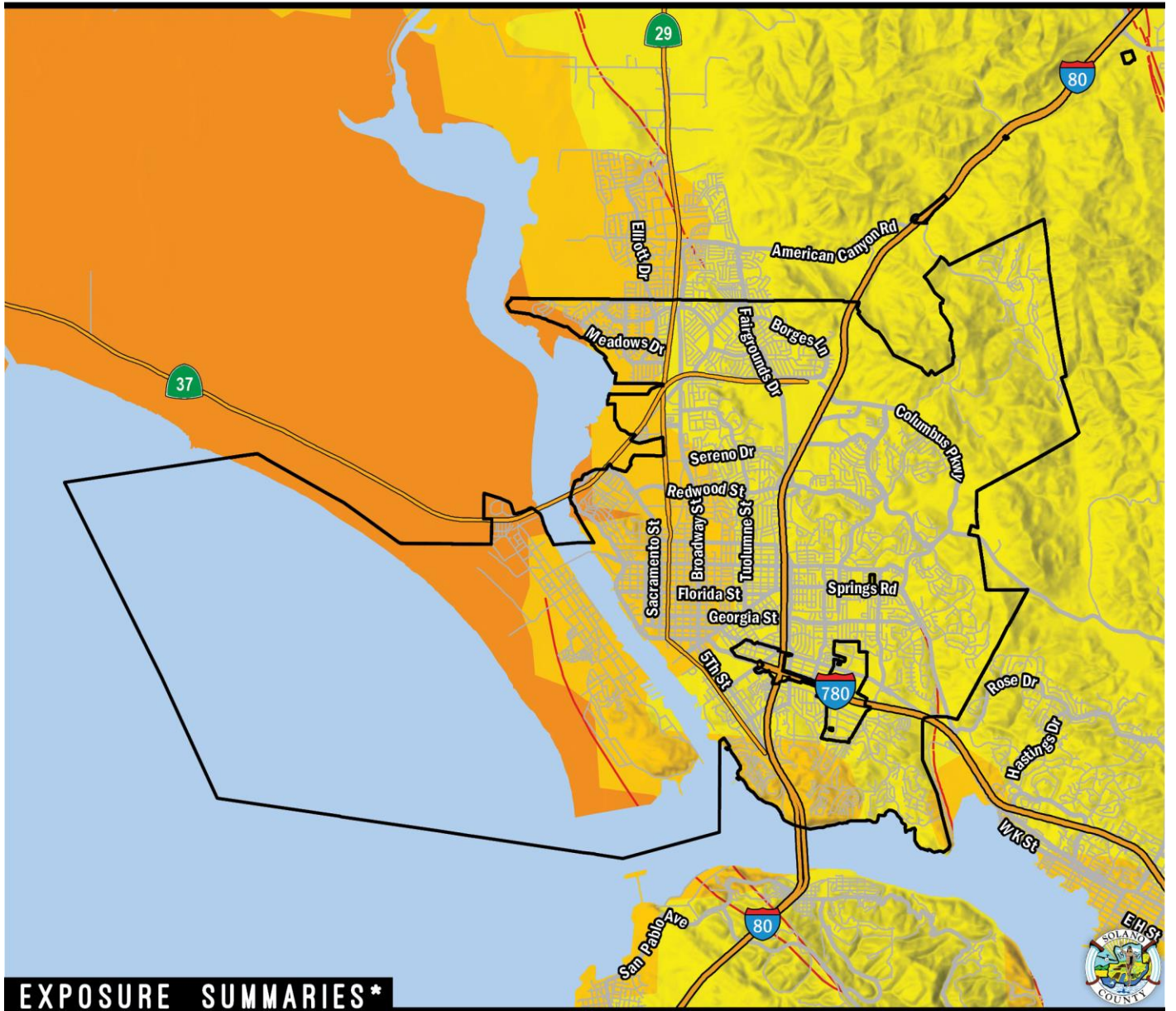
3 - Total Value = \$6,441,088,812





HAYWARD-RODGER'S CREEK EARTHQUAKE SCENARIO (M7.1)

VALLEJO



EXPOSURE SUMMARIES*

POPULATION COUNT IN HAZARD AREA

Count	Exp. Rate**
120,977	100%
Count Includes: S+++E	

PARCEL COUNT IN HAZARD AREA

Count	Exp. Rate**
35,405	100%
Count Includes: S+++E	

PARCEL VALUE IN HAZARD AREA

Sum of Improvement Value	Exp. Rate**
\$16,580,539,022	100%
Sum of Content Value	Exp. Rate**
\$9,779,451,188	100%
Count Includes: S+++E	

CRITICAL INFRASTRUCTURE COUNTS IN HAZARD AREA

Infrastructure Category	Count	Exp. Rate**	Count/Sum Includes:
Essential Facilities	17	100%	S+++E
High Potential Loss	533	99%	Sum of Transportation & Lifeline Linear Mileage
Transportation & Lifeline	943	100%	724 100%

MAP LEGEND

III	IV	V	VI	VII	VIII	IX	X
WEAK	LIGHT	MODERATE	STRONG	VERY STRONG	SEVERE	VIOLENT	EXTREME
MMI							

*Exposure summaries include strong, very strong, violent, and severe MMI classes. Hazard data source: USGS.

**Exposure Rate - Exposed summary or count as a percentage of total summary or count within jurisdiction.

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Figure 7-6: City of Vallejo– Hayward Rodger's Creek EQ Scenario (M7.1)



Table 7-5: City of Vallejo–Hayward Rodger's Creek (M7.1) Damage Estimate Summaries

Building Type	Average of Potential Damage to Exceed "Slight"	Average of Potential Damage to Exceed "Moderate"	Average of Potential Damage to Exceed "Extensive"	Average Economic Loss for Each Building Category	Sum of Economic Loss	Proportion of Loss (%)
Agriculture	0%	0%	0%	\$0	\$0	0%
Commercial	26%	9%	2%	\$142,109	\$133,013,978	23%
Education*	41%	22%	6%	\$551,693	\$4,965,237	1%
Emergency	27%	10%	2%	\$138,433	\$3,045,526	1%
Government	22%	7%	1%	\$220,032	\$26,183,768	4%
Industrial	43%	23%	5%	\$206,621	\$33,472,661	6%
Religion	20%	4%	0%	\$35,564	\$4,267,662	1%
Residential	19%	3%	0%	\$11,211	\$383,039,007	65%
Total					\$587,987,839	

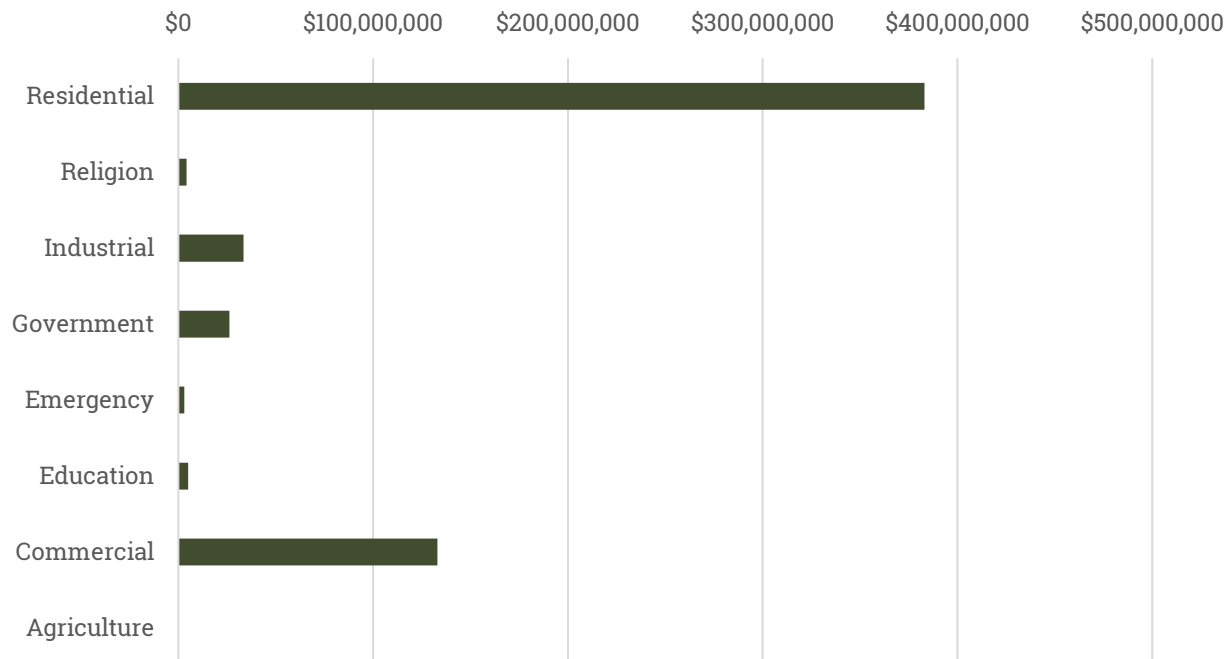
*School district asset information not available during time of Hazus analysis.

Note: Total Inventory Values

1 - Building Replacement Costs = \$3,773,922,295

2 - Content Replacement Costs = \$2,667,166,517

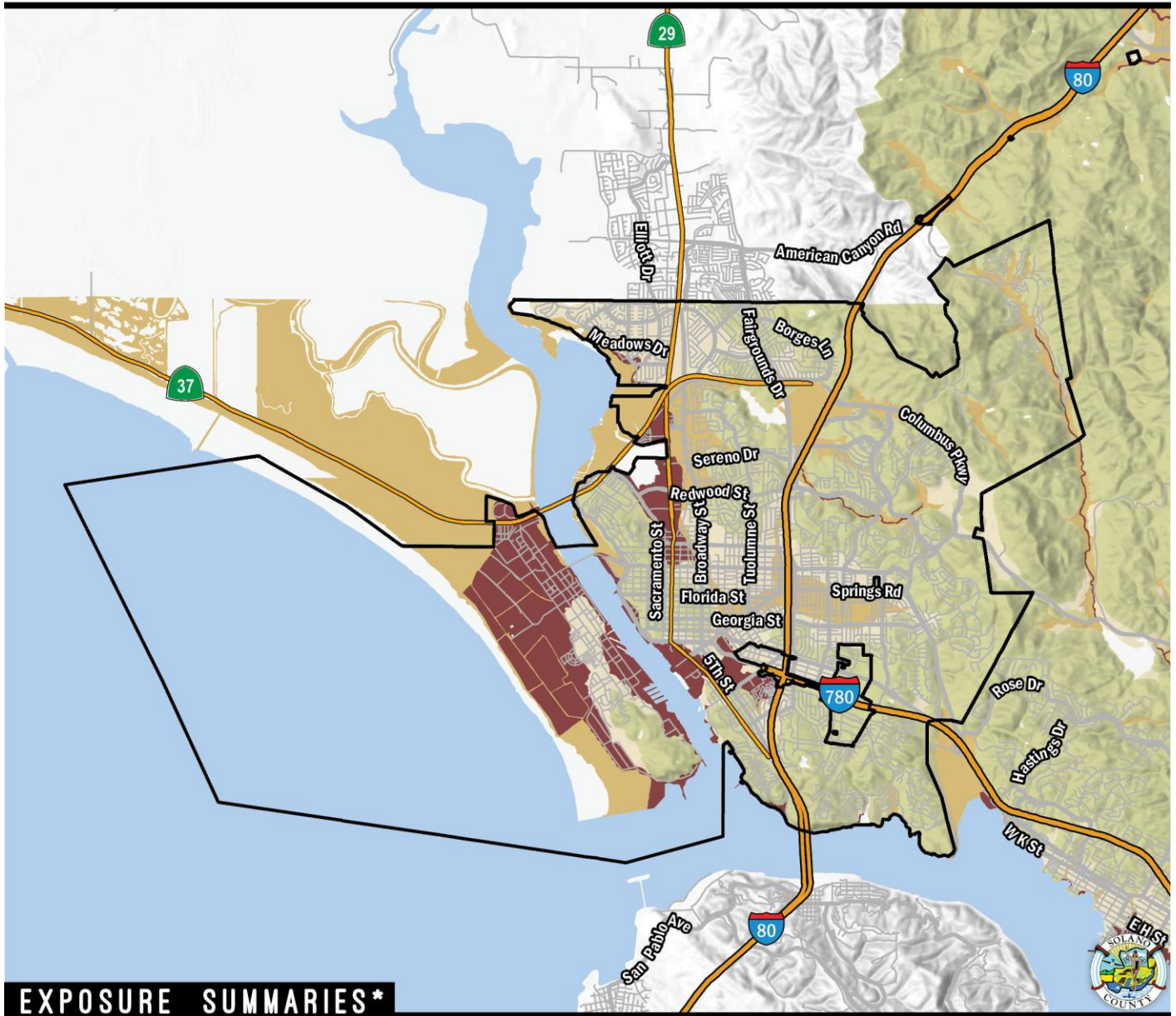
3 - Total Value = \$6,441,088,812





AREAS WITH POTENTIAL FOR LIQUEFACTION

VALLEJO



EXPOSURE SUMMARIES*

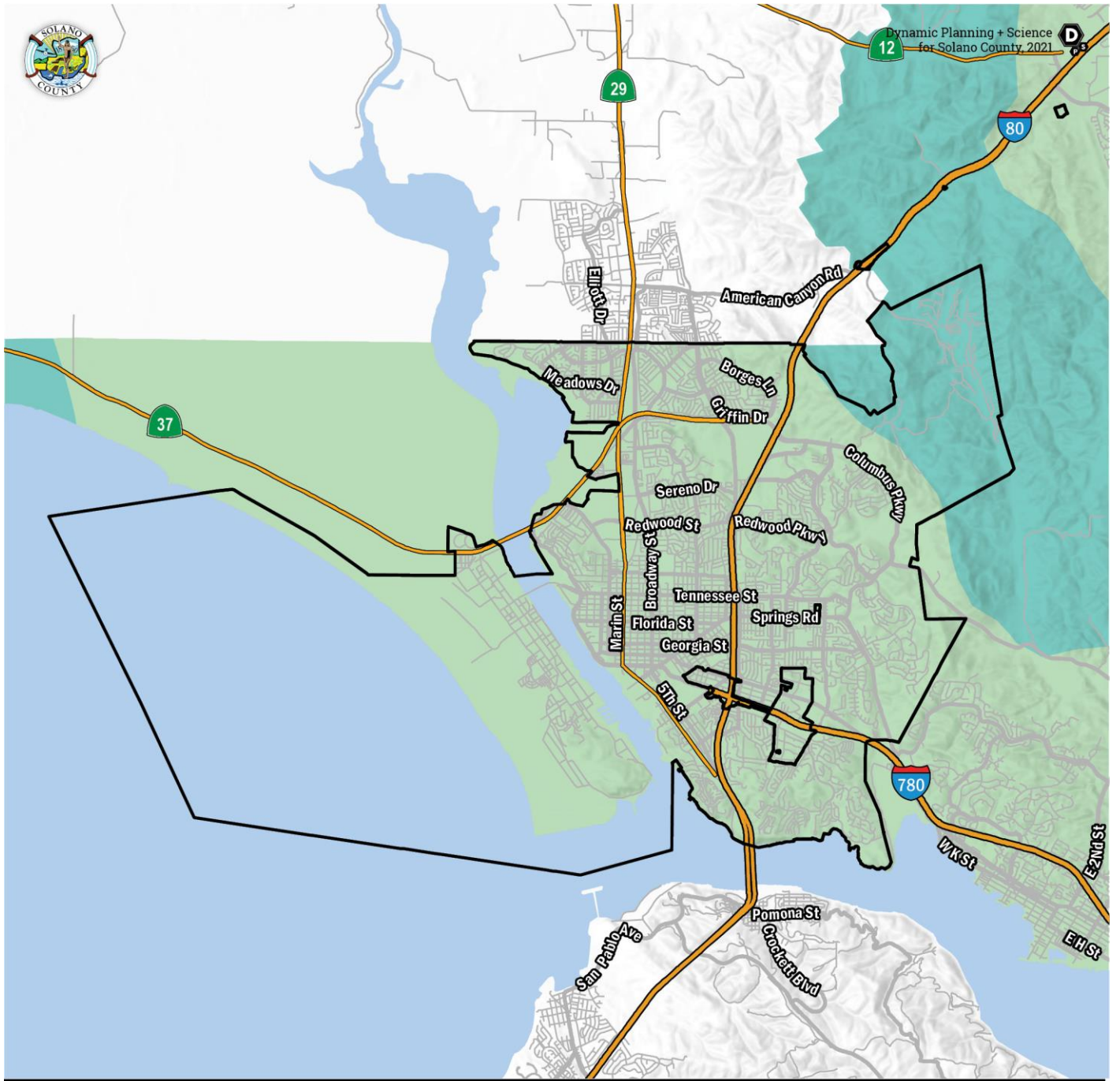
POPULATION COUNT IN HAZARD AREA		PARCEL COUNT IN HAZARD AREA		PARCEL VALUE IN HAZARD AREA		CRITICAL INFRASTRUCTURE COUNTS IN HAZARD AREA			
Count	Exp. Rate**	Count	Exp. Rate**	Sum of Improvement Value	Exp. Rate**	Infrastructure Category	Count	Exp. Rate**	Count/Sum Includes:
20,183	17%	4,466	13%	\$2,762,800,191	17%	Essential Facilities	5	29%	M H VH
Count Includes: M H VH		Count Includes: M H VH		Sum of Content Value		High Potential Loss	130	24%	Sum of Transportation & Lifeline Linear Mileage
				\$2,149,200,893	22%	Transportation & Lifeline	295	31%	195 27%
				Count Includes: M H VH					

MAP LEGEND

VL	L	M	H	VH
VERY LIGHT	LIGHT	MODERATE	HIGH	VERY HIGH

*Exposure summaries include medium, high, very high susceptibility. Hazard data source: USGS.
 **Exposure Rate - Exposed summary or count as a percentage of total summary or count within jurisdiction.
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Figure 7-7: City of Vallejo– Areas with Potential for Liquefaction



AVERAGE ANNUAL PRECIPITATION (1981-2010, INCHES) VALLEJO

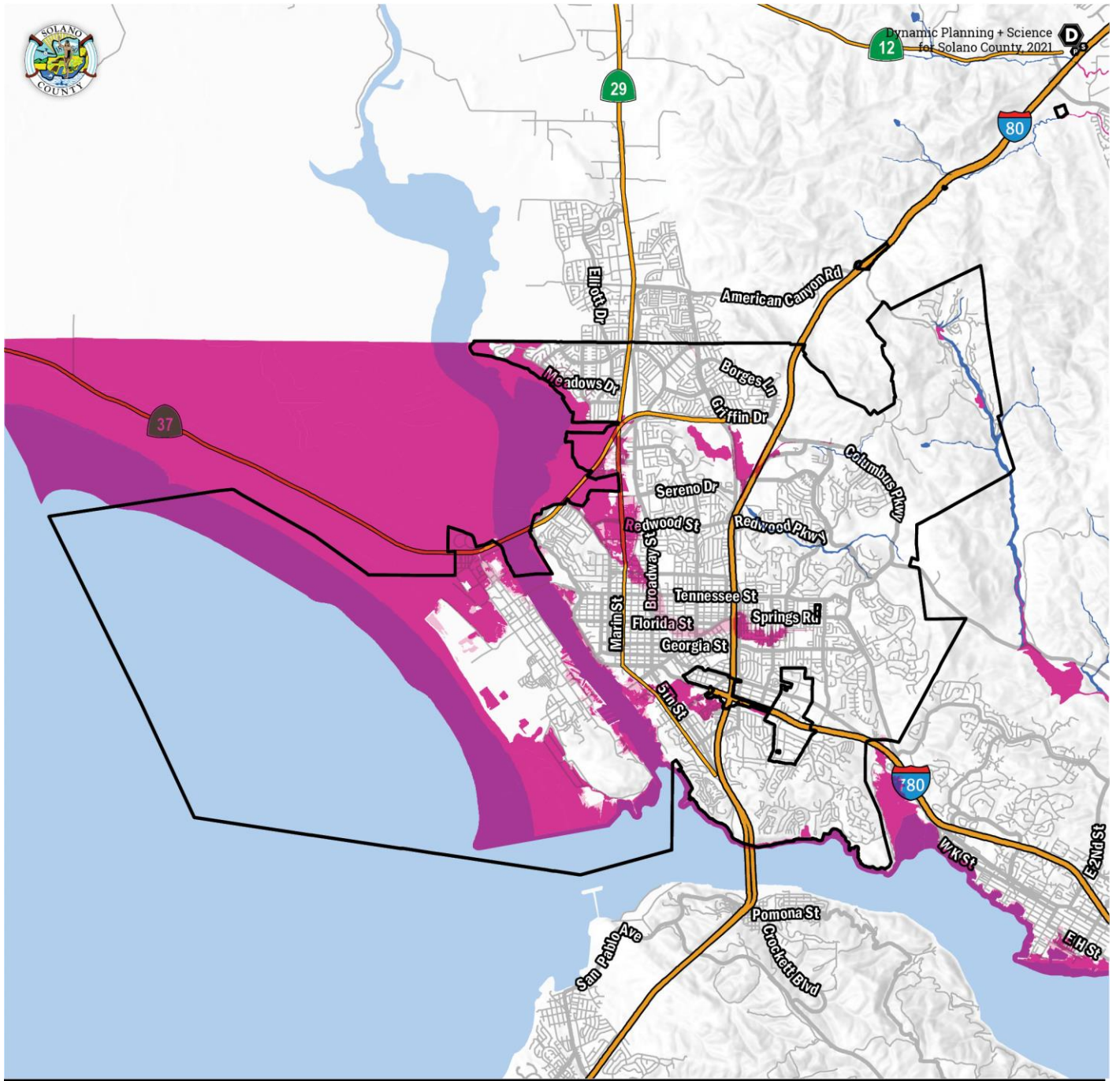
*Data sources: USDA - 1981-2010 Annual Average Precipitation by State.



Figure 7-8: City of Vallejo– Average Annual Precipitation (1981-2010. Inches)



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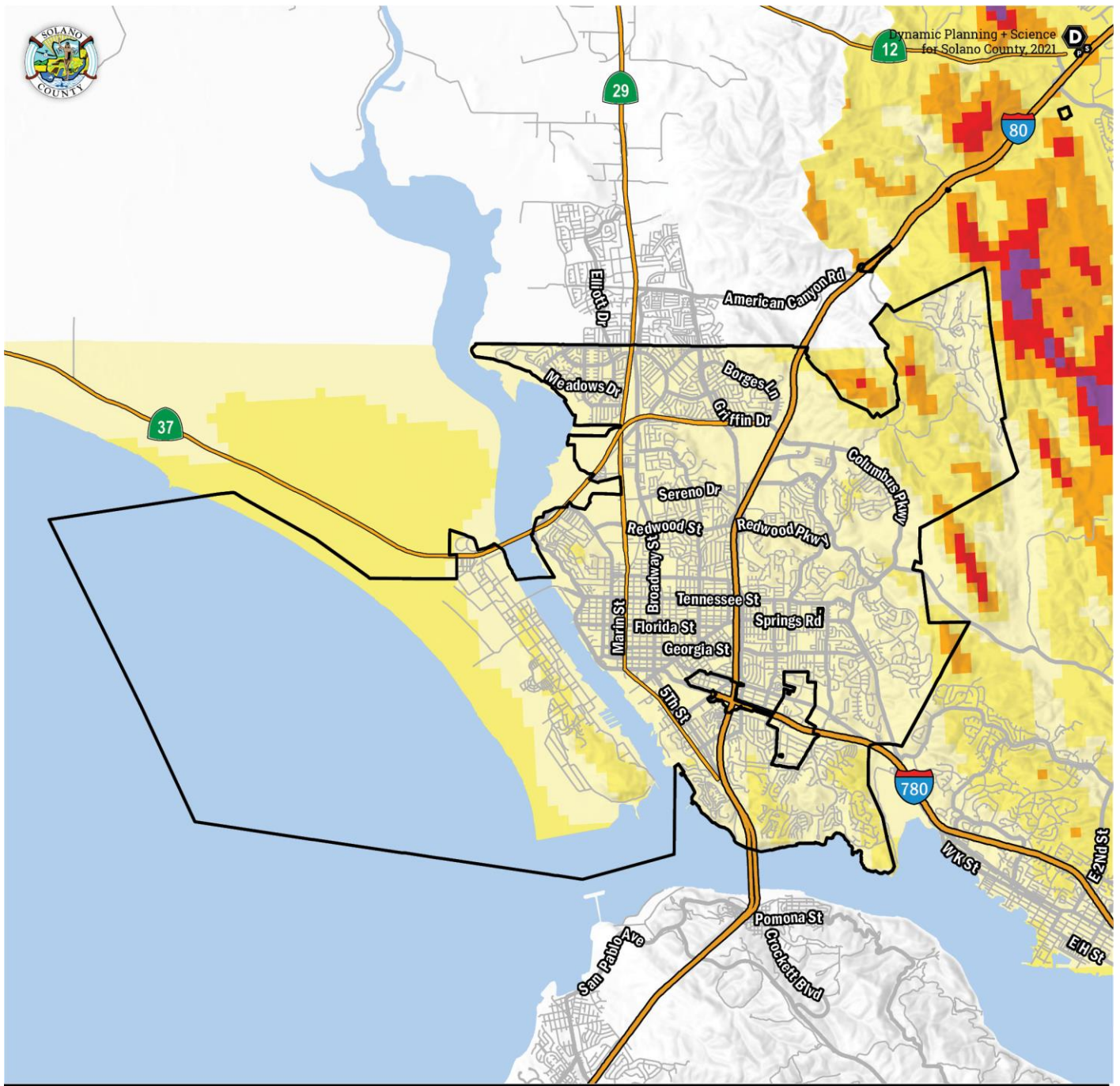


BAM 200-YR FLOODING AND AWARENESS ZONES VALLEJO

*Data sources: DWR.

FEMA FLOOD ZONES		DWR AWARENESS ZONES	
100-YR (SFHA)	500-YR		
USACE SAC. SAN JOAQUIN R. COMPREHENSIVE STUDY			
100-YR	200-YR	500-YR	

Figure 7-9: City of Vallejo– BAM 200-YR Flooding and Awareness Zones



**ANNUAL AVERAGE WIND SPEED (POWER CLASS)
VALLEJO**

*Data sources: NREL.



Figure 7-10: City of Vallejo– Annual Average Wind Speed (Power Class)



Table 7-6: Drought Classifications and Impacts

Category	Description	Possible Impacts
D0	Abnormally Dry	<ul style="list-style-type: none"> Active fire season begins Going into drought, short term dryness, slowing planting, growth of crops or pastures. Coming out of drought, some lingering water deficits and pasture or crops not fully recovered,
D1	Moderate Drought	<ul style="list-style-type: none"> Some damage to crops, pastures Streams, reservoirs, or wells low, some water shortages developing or imminent Voluntary water-use restrictions requested
D2	Severe Drought	<ul style="list-style-type: none"> Crop or pasture losses likely Water shortages common Water restrictions imposed
D3	Extreme Drought	<ul style="list-style-type: none"> Major crop/ pasture losses Widespread water shortages or restrictions
D4	Exceptional Drought	<ul style="list-style-type: none"> Exceptional and widespread crop/ pasture losses Shortages of water in reservoirs, streams, and wells creating water

Adapted from U.S. Drought Monitor Drought Classifications and Impacts

Drought Severity Timeline

San Pablo Bay

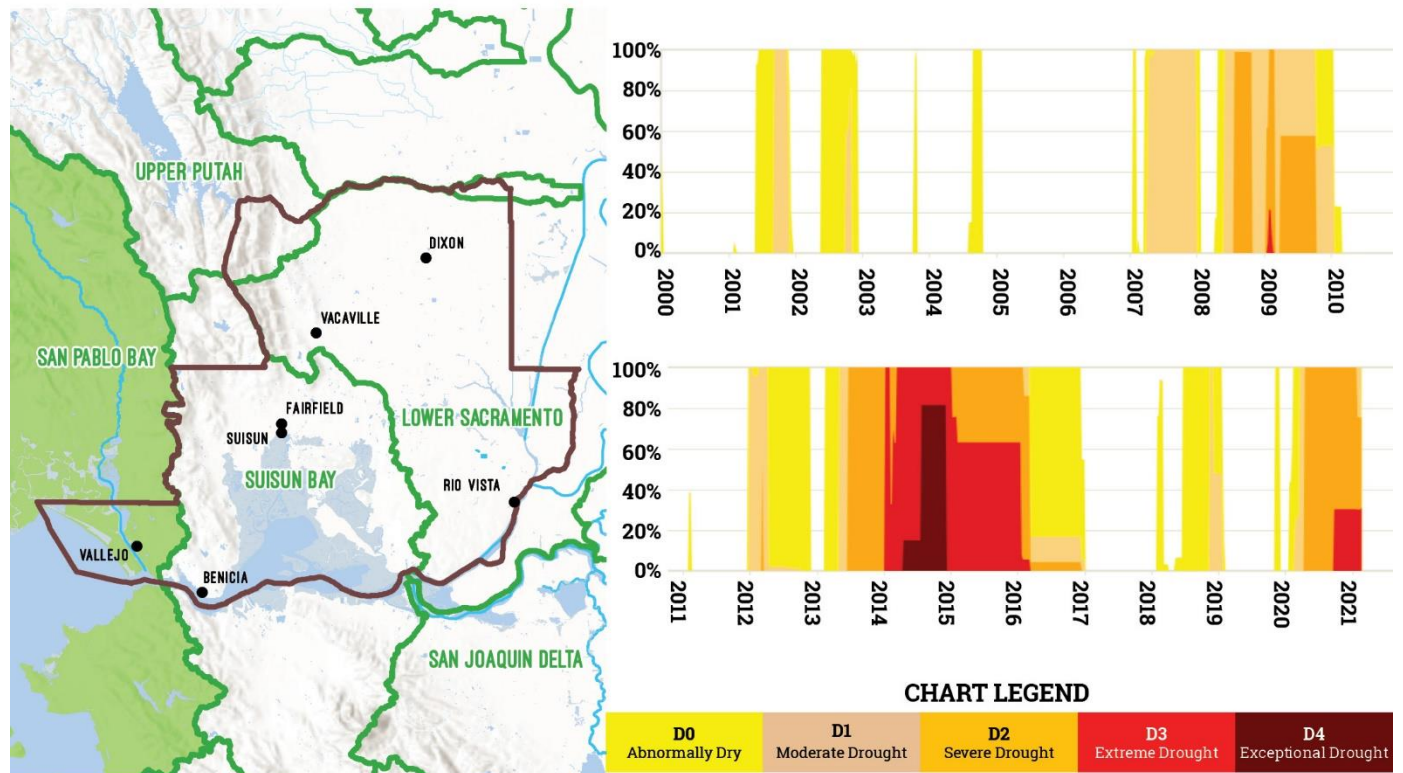


Figure 7-11: City of Vallejo– Drought Severity Timeline -San Pablo Bay



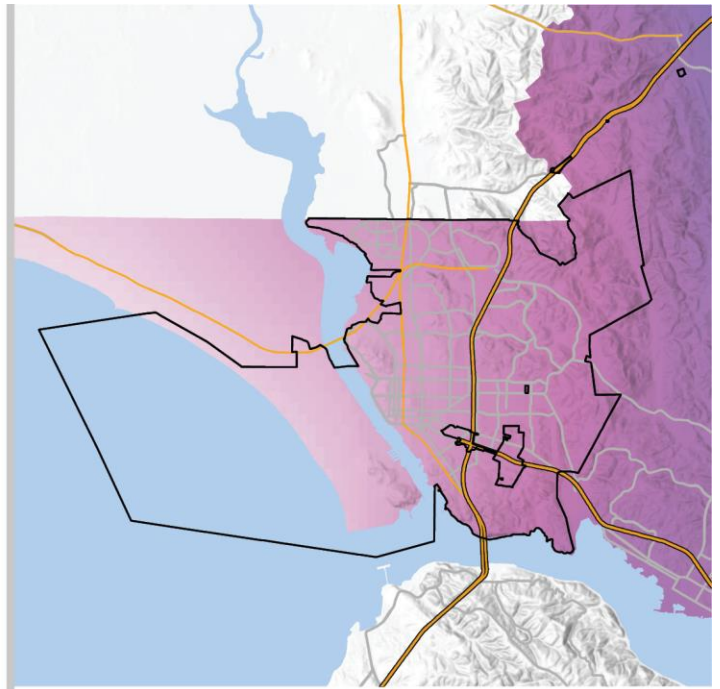
VALLEJO

AVERAGE ANNUAL MAXIMUM TEMPERATURE

COMPARISON OF CURRENT OBSERVED TO RCP 4.5 AND RCP 8.5 SCENARIOS



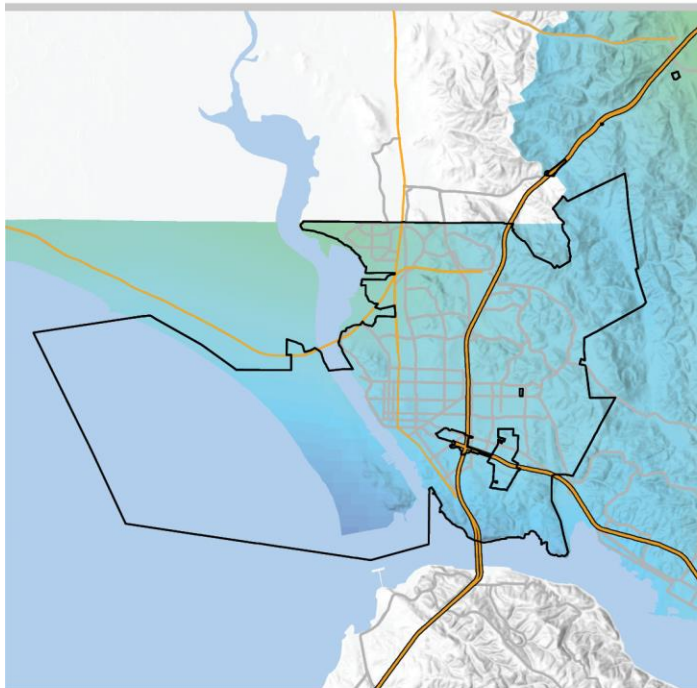
*Data sources: Cal-Adapt CanESM2 RCP 4.5 & 8.5, PRISM 30-YR Norms Annual Max Temp



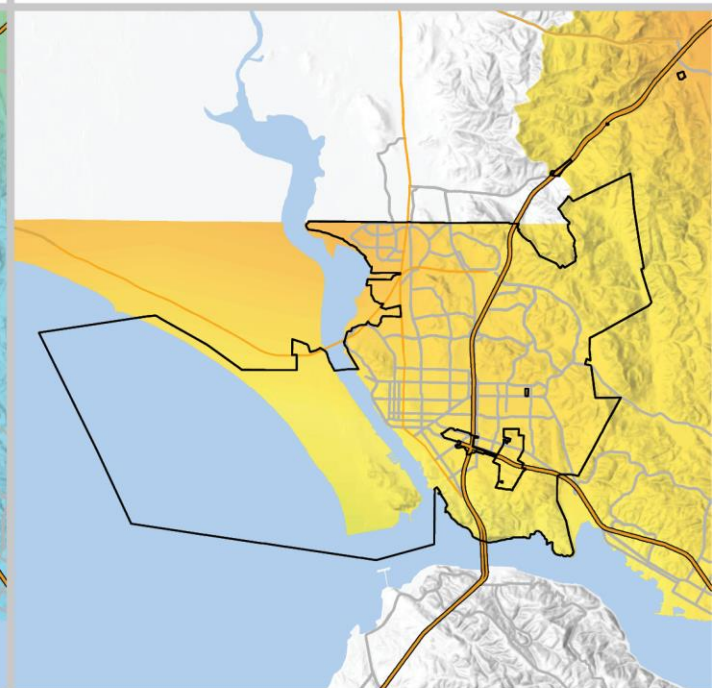
CURRENT 30-YR NORMAL



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RCP 4.5 YEAR 2100



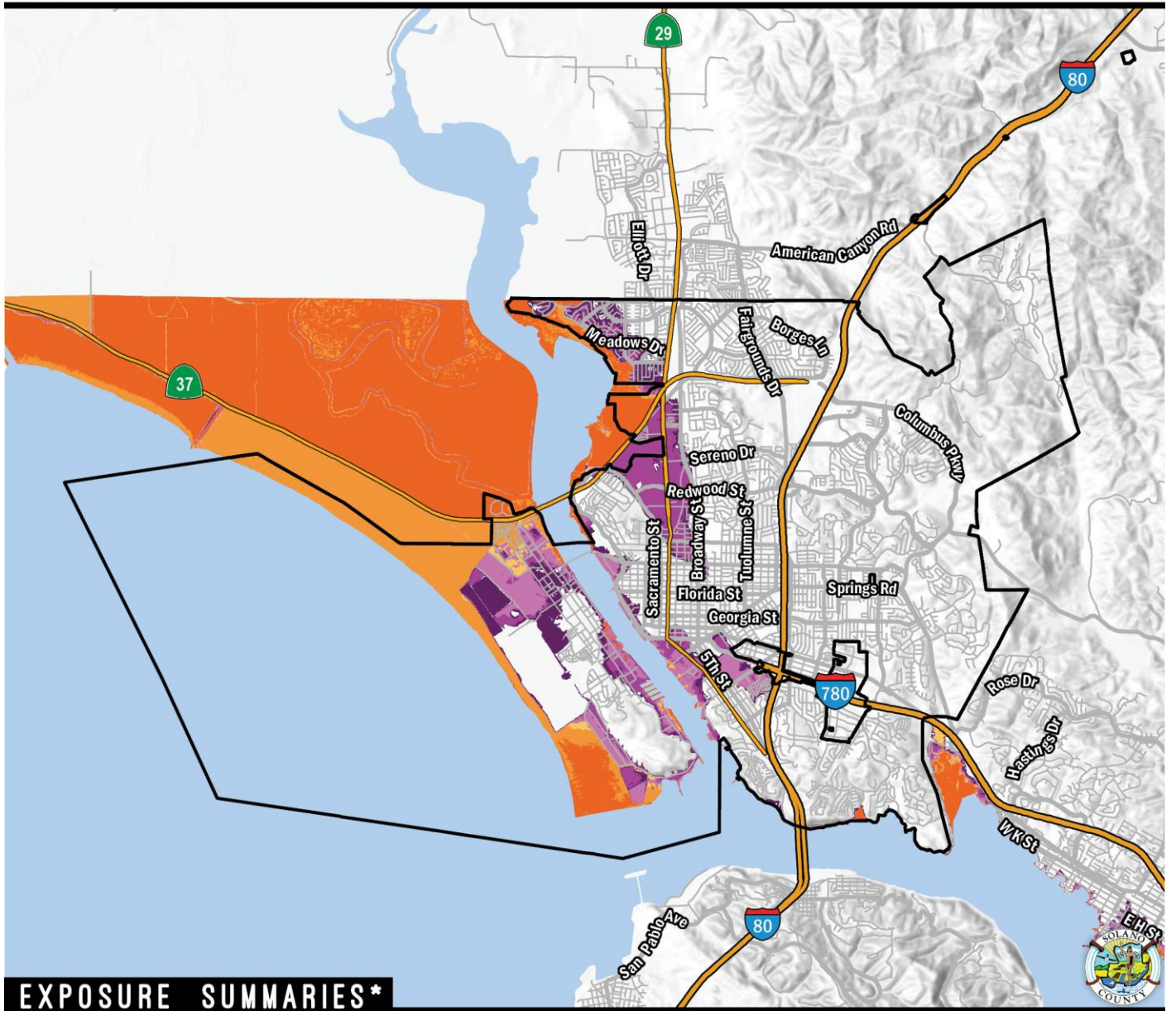
RCP 8.5 YEAR 2100

Figure 7-12: City of Vallejo – RCP Comparison



SEA LEVEL RISE EXPOSURE

VALLEJO



EXPOSURE SUMMARIES*

POPULATION COUNT IN HAZARD AREA		PARCEL COUNT IN HAZARD AREA		PARCEL VALUE IN HAZARD AREA		CRITICAL INFRASTRUCTURE COUNTS IN HAZARD AREA			
Count	Exp. Rate**	Count	Exp. Rate**	Sum of Improvement Value	Exp. Rate**	Infrastructure Category	Count	Exp. Rate**	Count/Sum Includes:
13,276	11%	2,482	7%	\$1,698,101,106	10%	Essential Facilities	1	6%	L+++E
Count Includes: L+++E		Count Includes: L+++E		Sum of Content Value		High Potential Loss	53	10%	Sum of Transportation & Lifeline Linear Mileage
				\$1,368,779,916	14%	Transportation & Lifeline	205	22%	120 17%
				Count Includes: L+++E					

MAP LEGEND

AMOUNT OF RISE

EXTREME (2.5M)	INTERMEDIATE (1.0M)
HIGH (2.0M)	INTERMEDIATE LOW (0.5M)
INTERMEDIATE HIGH (1.5)	LOW (0.3M)

*Exposure summaries include scenarios low rise to extreme rise. Hazard data source: NOAA.
 **Exposure Rate - Exposed summary or count as a percentage of total summary or count within jurisdiction.
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Figure 7-13: City of Vallejo– Sea Level Rise Exposure



7.4.3.3 Past and Future Development

The City of Vallejo is a charter city that crafts its own laws related to municipal affairs, including future development. If the City has not regulated, or the issue is not municipal in nature, the City is subject to State law. Future development may be subject to compliance with State of California planning, zoning, subdivision, and architecture laws.

The City of Vallejo's General Plan (GP) establishes long-range development policies. The GP is designed to help the City address issues related to land use, circulation (traffic), housing, open space, conservation, noise, and safety. The Land Use portion of the plan helps guide the City in determining the location of future development(s), including possible future annexation. In addition to the GP, the City has other plans that guide development in specific areas, including specific plans, policy plans, and master plans. These plans help to shape future development and dictate the City's Sphere of Influence (SOI). One of the central functions in these planning documents is to decrease risk of impact from natural hazards.

Development since Previous HMP

While growth has occurred in hazard areas in the past, increasing hazard risks to some degree, those risks are also decreased by development standards and plan requirements that serve to mitigate or avoid those risks. Development since the last HMP has not increased hazard vulnerability for the City of Vallejo. Problematic development generally occurred many decades ago; therefore, this HMP Annex has not been revised to reflect any substantial changes in past development and instead focuses on avenues to better mitigate impacts from problematic past development in the 1970's and earlier.

Future Development

City of Vallejo is required to update building codes to meet the minimum standards to those required in the California Building Code last updated in 2019. California Building Codes provide some of the safest construction standards in the world and are meant to reduce risk to occupants from high wind, seismic activity, landslides, flood, wildfire, and other natural hazards. In addition to California minimum development standards, all jurisdictions belong to the NFIP, and all development must meet minimum flood protection standards set forth by FEMA. See Section 4.3.5 of Volume 1 for more information about past and future development in Solano County.

As the General Plan is updated and incorporates information from this HMP, City of Vallejo staff are continually improving hazard information through these hazard mitigation plan updates. With this 2020 update, improved online mapping about natural hazards available on RAMP will inform those responsible for future development to make better decisions where and how future development occurs.

City of Vallejo reviewed its general plans under the capability assessments undertaken for this hazard mitigation plan. See Section 7.5.1. Deficiencies revealed by these reviews are identified as mitigation actions to decrease risks to move beyond past trends.



The City's municipal codes includes regulations to mitigate the impact of hazards on new and existing development, including:

- Drainage and stormwater retention requirements,
- Steep slope restrictions for new development,
- Waterbody buffer requirements,
- Floodplain management regulations,
- Zoning that prevents development in hazardous areas of the community such as floodplains, landslide areas, the wildland-urban interface (WUI), or other known hazard areas, and
- Building codes that include the most up-to-date California Fire Code, seismic standards, and many other provisions crafted to protect new construction from hazard events.

Even in the event that limited development did occur within a hazard area, the municipal code should ensure impacts from a hazard event are mitigated and losses are minimal. If development does occur in hazard areas, evacuation and emergency planning should take into consideration the anticipated local impacts of the hazard event, including potential interrupted services or the elimination of access.

The anticipated growth in the City will not cause significant change in vulnerability to the City for identified priority hazards.

National Flood Insurance Program (NFIP)

The NFIP makes federally backed flood insurance available to homeowners, renters, and business owners in participating communities. FEMA has prepared a detailed Flood Insurance Study (FIS) for Solano County and municipalities. The study presents water surface elevations for floods of various magnitudes, including the 1-percent annual chance flood and the 0.2-percent annual chance flood (the 500-YR flood). Base flood elevations and the boundaries of the 100- and 500-YR floodplains are shown on Flood Insurance Rate Maps (FIRMs), which are the principal tools for identifying the extent and location of the flood hazard. FIRMs are the most detailed and consistent data source available, and for many communities they represent the minimum area of oversight under their floodplain management program. See Section 4 of Volume 1 for general information on the NFIP.

The City of Vallejo has participated in the NFIP since 1978. The City of Vallejo is currently in good standing with the provisions of the NFIP. Compliance is monitored by FEMA regional staff and by the California Department of Water Resources under a contract with FEMA. Maintaining compliance under the NFIP is an important component of flood risk reduction. See Table 7-7 for more information on the City's policies and historic flood insurance claims.



Table 7-7: NFIP Status Table

NFIP and CRS Status & Information	
City of Vallejo	
NFIP Status	10/17/78
CRS Class	-
Policies in Force	314
Policies in SFHA	144
Policies in non-SFHA	170
Total Claims Paid	\$890,171
Paid Losses	132
Repetitive Loss Properties	18
Severe Repetitive Loss Properties	1
Repetitive Loss Payment by NFIP on Building	\$424,760
Repetitive Loss Payment by NFIP on Contents	\$63,439

Source: FEMA CIS 2021, OpenFEMA Data, FIMA RUL Solano County

Note: Policies and claims provided directly from FEMA Region IX CIS Report (8/2021). Repetitive loss tabulations by jurisdiction derived via GIS-based intersect of data available at OpenFEMA Data (<https://www.fema.gov/about/openfema/data-sets>). Countywide data reported for entire county area including municipalities. The Privacy Act of 1974 (5 U.S.C. 522a) restricts the release of certain types of data to the public. Flood insurance policy and claims data are included in the list of restricted information. FEMA can only release such data to state and local governments, and only if the data are used for floodplain management, mitigation, or research purposes. Therefore, this plan does not identify the repetitive loss properties or include claims data for any individual property.

See Volume 1, Section 4.5 for more information on the NFIP

7.4.3.4 Identify Hazard Problem Statements

As part of the mitigation action identification process, the Planning Committee for each jurisdiction identified areas of concern (aka problem statements) for their respective facilities based on the risk assessment and vulnerability analysis, utilizing the RAMP mapping and static snapshot maps. Problem statements focused on the impact, victim, or threat that the hazard could create in the jurisdiction, as described in Figure 7-14. Identifying common issues and weaknesses through these problem statements assisted the Planning Committee in understanding the realm of resources needed for mitigation. Jurisdiction problem statements are listed in Table 7-8.

The goal is to have at least one mitigation action for every problem statement. Projects or actions have been developed to mitigate each problem identified. See Table 7-13 for a full list of mitigation actions and corresponding problem statements that they address. Each problem statement is coded with a problem number for cross-referencing between Table 7-8 and Table 7-13.

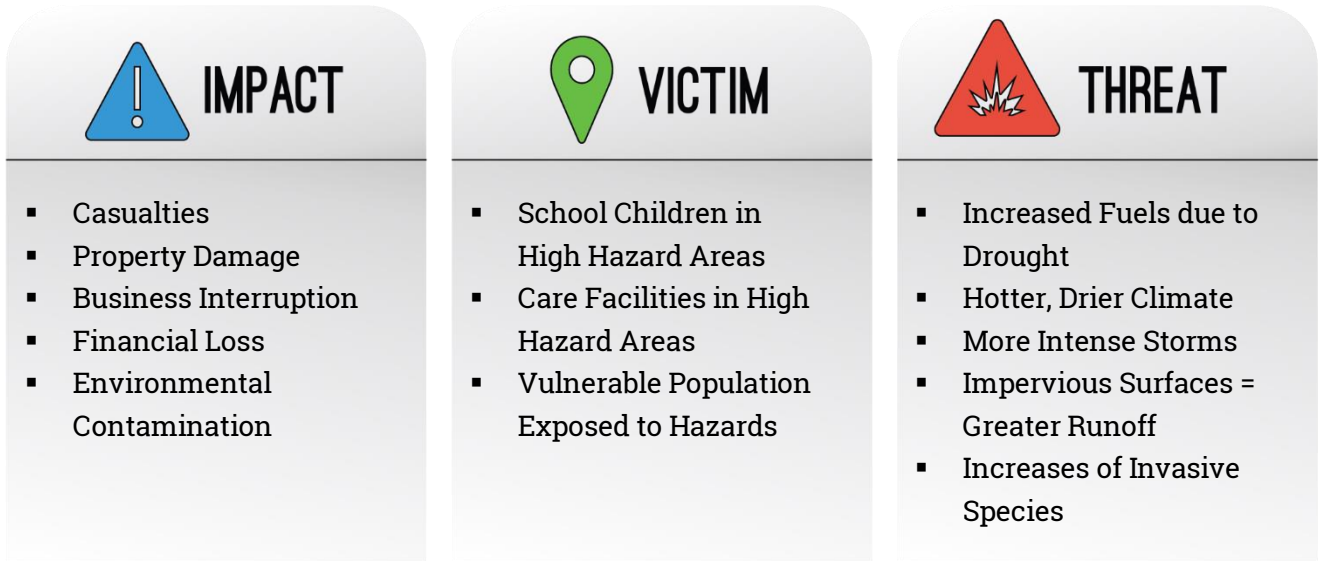


Figure 7-14: Guidance for Problem Statements

Table 7-8: Problem Statements

Problem No.	Hazard Type	Area of Concern	Mitigation Alternatives	Primary Agency	Problem Description	Related MA
ps-WF-VL-60	Wildfire	Impact	PRV - Prevention , NRP - Natural Resource Protection	City of Vallejo	The City can benefit from additional vegetation management efforts to minimize the presence of wildfire fuels.	ma-EW-VL-158
ps-WF-VL-61	Wildfire	Victim	PRV - Prevention , PPRO - Property Protection , PE&A - Public Education & Awareness , ES - Emergency Services	City of Vallejo	There are approximately 51,227 people living in a moderate wildfire risk area in the City of Vallejo.	ma-WF-VL-160
ps-WF-VL-62	Wildfire	Victim	PRV - Prevention , PPRO - Property Protection , PE&A - Public Education & Awareness	City of Vallejo	There are 91 child care facilities located in a moderate wildfire risk area in the City of Vallejo.	ma-WF-VL-160
ps-WF-VL-63	Wildfire	Threat	PRV - Prevention , PPRO - Property Protection , PE&A - Public Education & Awareness	City of Vallejo	The City has a lot of open space with fuels that increase the risk of wildfire. Glenco Waterfront Park and Don Hunts park are areas of specific concern.	ma-EW-VL-158, ma-WF-VL-161



Problem No.	Hazard Type	Area of Concern	Mitigation Alternatives	Primary Agency	Problem Description	Related MA
ps-EQ-VL-64	Earthquake	Impact	ES - Emergency Services , SP - Structural Projects	City of Vallejo	The City does not have a seismic gas shut-off valve ordinance or program.	ma-EQ-VL-150
ps-EQ-VL-65	Earthquake	Impact	ES - Emergency Services , SP - Structural Projects	City of Vallejo	City facilities may lack seismic gas shut-off valves.	ma-EQ-VL-151
ps-EQ-VL-66	Earthquake	Impact	SP - Structural Projects	City of Vallejo	Buildings on Mare Island may be particularly vulnerable to the impacts of earthquakes due to their old age.	ma-EQ-VL-152
ps-EQ-VL-67	Earthquake	Impact	PRV - Prevention , ES - Emergency Services	City of Vallejo	Emergency Action Plan's for dams throughout the City of Vallejo are in need of updating in the next couple years.	ma-EQ-VL-153
ps-EQ-VL-68	Earthquake	Impact	SP - Structural Projects	City of Vallejo	Unreinforced masonry buildings in the City of Vallejo are vulnerable to the impacts of earthquakes.	ma-EQ-VL-152
ps-EQ-VL-69	Earthquake	Impact	SP - Structural Projects	City of Vallejo	Aging infrastructure, including pipelines, are vulnerable to the impacts of earthquakes.	ma-EQ-VL-152
ps-EQ-VL-70	Earthquake	Impact	SP - Structural Projects	City of Vallejo	City water tanks and reservoirs are vulnerable to the impacts of earthquakes.	ma-EQ-VL-154
ps-EQ-VL-71	Earthquake	Victim	PPRO - Property Protection , PE&A - Public Education & Awareness , ES - Emergency Services , SP - Structural Projects	City of Vallejo	Approximately 44,208 people live in a very strong shake zone for 6.8 Concord Green Valley EQ Scenario.	ma-EQ-VL-155
ps-EQ-VL-72	Earthquake	Victim	PPRO - Property Protection , PE&A - Public Education & Awareness , ES - Emergency Services , SP - Structural Projects	City of Vallejo	Approximately 2,311 people live in a severe shake zone area for the 7.1 Hayword Rodgers Creek EQ scenario.	ma-EQ-VL-155
ps-EQ-VL-73	Earthquake	Victim	PPRO - Property Protection , PE&A - Public Education & Awareness , ES - Emergency Services , SP - Structural Projects	City of Vallejo	There are 66 child care facilities and 13 schools located in a very strong shake zone for the 6.8 Concord Green Valley EQ Scenario.	ma-EQ-VL-155



Problem No.	Hazard Type	Area of Concern	Mitigation Alternatives	Primary Agency	Problem Description	Related MA
ps-DR-VL-74	Drought	Impact	PE&A - Public Education & Awareness , SP - Structural Projects	City of Vallejo	Periods of drought can have an impact on the water supply for the City of Vallejo.	ma-DR-VL-149
ps-EW-VL-75	Extreme Weather	Impact	PE&A - Public Education & Awareness , ES - Emergency Services	City of Vallejo	High wind events can increase the frequency of PSPS events, impacting City pump stations.	ma-EW-VL-156
ps-EW-VL-76	Extreme Weather	Impact	PPRO - Property Protection , PE&A - Public Education & Awareness , SP - Structural Projects	City of Vallejo	Heavy rains could create localized flooding issues around City infrastructure and roads, posing a threat to buildings and creating hazardous travel conditions.	ma-FL-VL-157
ps-EW-VL-77	Extreme Weather	Threat	PPRO - Property Protection , PE&A - Public Education & Awareness	City of Vallejo	High winds exacerbate the impacts of wildfire.	ma-EW-VL-158
ps-EW-VL-78	Extreme Weather	Threat	PPRO - Property Protection , PE&A - Public Education & Awareness , NRP - Natural Resource Protection	City of Vallejo	High winds can blow trees over presenting hazards for buildings, roads, and pedestrians/cars.	ma-EW-VL-159
ps-CC-VL-181	Climate Change	Impact	SP - Structural Projects	City of Vallejo	The City has an estimated 2,500 parcels in areas that would be exposed to high and extreme levels of sea level rise.	ma-CC-VL-203

7.4.4 Mitigation Action Support Tool (MAST)

As a living document, hazard problem statements and mitigation activities will be updated through a web interface application developed specifically for participating jurisdictions. The Mitigation Action Support Tool (MAST) is accessible through mitigatehazards.com/SolanoHMP/.

MAST is a web-based interactive tool that enables multiple users to search, view, enter, and update mitigation actions, ideas or projects, and other information. MAST provides participating jurisdictions and plan reviewers (Cal OES/FEMA) access to valuable mitigation information that can be leveraged by future planning or other risk reduction efforts within the County. Participating jurisdictions can update the status of their mitigation projects throughout the planning lifecycle, and this web-based tool will improve participating jurisdiction’s ability to apply for FEMA’s Hazard Mitigation Assistance (HMA) grant programs including initial grant application processes through Cal OES.



7.5 Mitigation Strategy

The mitigation strategy is the guidebook to future hazard mitigation administration, capturing the key outcomes of the MJHMP planning process. The mitigation strategy is intended to reduce vulnerabilities outlined in the previous section (a.k.a. problem statements) with a prescription of policies and physical projects. These mitigation actions should be compatible with existing planning mechanisms and should outline specific roles and resources for implementation success.

7.5.1 Capabilities & Adaptive Capacity Assessment

This section examines the planning and regulatory, administrative, technical, financial, educational, and outreach capabilities to augment known issues and weaknesses from identified natural hazards.

Capabilities assessments in this Volume 1 and in Volume 2 include considerations of a community's adaptive capacity for climate change, as outlined in Cal OES' 2020 California Adaptation Planning Guide. Adaptive capacity is a community or region's existing ability to moderate climate change impacts. Assessing adaptive capacity includes analysis of policies, plans, programs, funding, and staffing capacity.

The tables in this section explore various local planning mechanisms, administrative capacity, financial capabilities, and education and outreach initiatives. The columns in each table represent deeper dives into the following questions:

- Is the existing planning or regulatory mechanism used currently? (Column 1, Status)
- Has the HMP been integrated into the planning mechanism currently so that the named mechanism is currently used in HMP planning? (Column 2, Current Mitigation Use)
- Is there a future opportunity to expand, improve upon, and incorporate this 2020 HMP Update into the planning or regulatory mechanism? (Column 3, Future Opportunity)

The capabilities assessment is easily-digestible and based on color coding to indicate which policies and plans are adequate, need improvement or in which the HMP could be integrated. Each table includes a legend that explain how each one of these questions are being answered according to the color indicated: green, yellow, and orange.

For more information on the regulatory environment surrounding each hazard, see hazard-specific sections of Volume 1. Volume 1, Section 5.3.5 includes an extensive list of federal and state funding opportunities as well.



7.5.1.1 Planning and Regulatory Capabilities

Table 7-9: Planning and Regulatory Capabilities

CAPABILITY ASSESSMENT LEGEND		
Status	Current Mitigation Use	Future Opportunity
Currently in use or present.	Used widely for mitigation.	Opportunity to expand and integrate.
(Sort of) Seldomly used or limited presence.	Limited use in mitigation planning.	Limited opportunity to expand and integrate.
(No) Not present or available.	Not used in mitigation planning.	No opportunity to expand or integrate.

Resource	HMP Integration			Notes / Additional Detail
	Status	Current Mitigation Use	Future Opportunity	
Planning and Regulatory Capabilities				
Construction and Future Development Regulations				
Building Codes				2019 California Building Code
Building Code Effectiveness Grading Schedule (BCEGS) Rating				
Public Protection (ISO Class)				
Hazard Related Development Standards				Standards for construction (7.98.160)
Hazard-Specific Ordinance				Flood Management Regulations (Chpt. 7.98); Mudslide prone areas (7.98.230); Coastal High Hazard Areas (7.98.220)
Zoning Ordinance				
Growth Management Ordinance				
Hazard Reduction Programs (Annually Conducted)				
Capital Improvements Program (CIP) or Plan				
Erosion/Sediment Control Program				
Hazard-Related Public Outreach Program				
Stormwater Management Program (Annual Inspections)				
Seismic Safety Program (Non-structural Inspections)				
Earthquake Modernization Program (Building Safety Inspections)				
Hazard Plans				
General Plan Safety Element				General Plan 2040
Noteworthy Area/ Specific Plan with Hazard Focus				White Slough Specific Plan (Solano County, 1979)
Community Wildfire Protection Plan (CWPP)				



Resource	HMP Integration			Notes / Additional Detail
	Status	Current Mitigation Use	Future Opportunity	
Planning and Regulatory Capabilities				
Wildfire Vulnerability Assessment				
Urban or Integrated Regional Water Management Plan				2015 City of Vallejo Urban Water Management Plan
Floodplain Management Plan	N/A	N/A	N/A	Vallejo Flood and Wastewater jurisdiction
Stormwater Management Plan				Storm Water Pollution Prevention Plan
Ground Water Management Plan(s)				Solano County GSP in development
Open Space and Land Management Plan(s)				
Emergency Operations Plan				2017 Solano County Emergency Operations Plan
Climate Action Plan, Vulnerability Ass'mt, or Adaptation Plan				2011 County of Solano Climate Action Plan; 2012 unadopted Plan
Sustainable Community Plan (SB 375)				2012 Climate Action Plan
Local Delta/ Wetlands Program(s)				Delta Plan; White Slough Specific Plan (Solano County, 1979)
Downtown Plan with hazard focus				Downtown Specific Plan
Community Health Assessment(s)	N/A	N/A	N/A	Solano County Community Health Assessment
National Flood Protection Program (NFIP)				
Floodplain Management Regulations				
Flood Insurance Education and Technical Assist.				2013 Flood Insurance Study
Flood Hazard Mapping / Re-Mapping				
Community Rating System (CRS)				



7.5.1.2 Administrative and Technical Capabilities

Table 7-10: Administrative and Technical Capabilities

CAPABILITY ASSESSMENT LEGEND		
Status	Current Mitigation Use	Future Opportunity
Currently in use or present.	Used widely for mitigation.	Opportunity to expand and integrate.
(Sort of) Seldomly used or limited presence.	Limited use in mitigation planning.	Limited opportunity to expand and integrate.
(No) Not present or available.	Not used in mitigation planning.	No opportunity to expand or integrate.

Resource	HMP Integration			Notes / Additional Detail
	Status	Current Mitigation Use	Future Opportunity	
Administrative and Technical				
Community Planning and Development Services				
Community Planner				While the City is fully staffed, and staff focus on hazard mitigation as appropriate, there are ample opportunities to better integrate the HMP into staffing roles and responsibilities.
Civil Engineer				
Building Code Official				
Floodplain Administrator				
Fire Marshall				
Dedicated Public Outreach Personnel				
GIS Specialist and Capability				
Emergency Manager				
Grant Manager, Writer, or Specialist				
Other				
Warning Systems/Services				
General			N/A	AlertSolano
Flood			N/A	Emergency Alert: AlertSolano Flood Risk: California Department of Water Resources Flood Risk Notification Program Flood Control: Solano County Water Agency
Wildfire			N/A	AlertSolano
Geological Hazards			N/A	AlertSolano; ShakeAlert.org (nation-wide)



7.5.1.3 Financial Capabilities

Table 7-11: Financial Capabilities

CAPABILITY ASSESSMENT LEGEND		
Status	Current Mitigation Use	Future Opportunity
Currently in use or present.	Used widely for mitigation.	Opportunity to expand and integrate.
(Sort of) Seldomly used or limited presence.	Limited use in mitigation planning.	Limited opportunity to expand and integrate.
(No) Not present or available.	Not used in mitigation planning.	No opportunity to expand or integrate.

Resource	HMP Integration			Notes / Additional Detail
	Status	Current Mitigation Use	Future Opportunity	
Fiscal Capabilities				
Financial Resources for Hazard Mitigation				
Levy for Specific Purposes with Voter Approval				Also under VFWD jurisdiction
Utilities Fees	N/A	N/A	N/A	
Benefit assessments				
System Development Fee	N/A	N/A	N/A	
Various Bonds to Incur Debt				
Withheld Spending in Hazard-Prone Areas				
Stormwater Service Fees	N/A	N/A	N/A	VFWD
Capital Improvement Project Funding				



7.5.1.4 Education and Outreach

Table 7-12: Education and Outreach Capabilities

CAPABILITY ASSESSMENT LEGEND		
Status	Current Mitigation Use	Future Opportunity
Currently in use or present.	Used widely for mitigation.	Opportunity to expand and integrate.
(Sort of) Seldomly used or limited presence.	Limited use in mitigation planning.	Limited opportunity to expand and integrate.
(No) Not present or available.	Not used in mitigation planning.	No opportunity to expand or integrate.

Resource	HMP Integration			Notes / Additional Detail
	Status	Current Mitigation Use	Future Opportunity	
Education / Outreach Capabilities				
Education/Outreach Resources				
Website Dedicated to Hazard Topics				Vallejo Flood and Wastewater has some; limited flood; could focus more on mitigation
Dedicated Social Media				
Hazard Info. Avail. at Library/ Planning Desk				
Annual Public Safety Events				None recently due to COVID-19
Ability to Field Public Tech. Assistance Requests				
Public Safety Newsletters or Printed Outreach				
Fire Safe Councils	N/A	N/A	N/A	
Resource Conservation Districts				Solano Resource Conservation District
Other				

7.5.1.5 Capability and Adaptive Capacity Opportunities

The City of Vallejo identified many opportunities for strengthening community capabilities and adaptive capacity. The City considered this assessment in developing its Mitigation Strategy.

Notably some of the city’s mitigation-related planning documents are quite old and could be updated as a first step to increasing capacity. The City also had good capacity under its current codes, staffing capacity, and education and outreach capacity.

Volume 1, Section 5.3.5 includes an extensive list of federal and state funding opportunities to leverage to improve community capabilities.



7.5.2 Mitigation Actions

Mitigation actions were developed based upon the jurisdiction’s priorities, risk assessment results, and mitigation alternatives. The mitigation action prioritization method used by all participating jurisdictions is described in Section 5.5.1 of Volume 1. Table 7-13 lists each priority mitigation action, responsible party, time frame, potential funding source, implementation steps, and resources need to implement based upon the Planning Committee consensus.

Each participating jurisdiction, including the City of Vallejo, considered ongoing relevancy of mitigation actions from the existing MJHMP and retained or removed such actions while adding new relevant actions as well. Mitigation actions were examined for relevancy and the potential for future implementation and then evaluated for potential follow-up. Some mitigation actions developed during the previous HMP effort were not included because they were an inherent part of the HMP update process or were not detailed enough for implementation at a local Jurisdiction level. the City of Vallejo has made significant changes to other mitigation actions because of the updated risk assessment and implementation strategy, to include more detail, or to update based on current mitigation practices. Volume 1, Section 5.5.2 provides a record of County wide mitigation actions, the status, and additional notes for each action.

Table 7-13 lists each mitigation action for the City of Vallejo. Each participating jurisdiction developed unique mitigation actions, targeted at their own unique priorities and vulnerabilities. Each mitigation action identifies the responsible party, time frame, potential funding source, implementation steps and resources needed to implement these priority mitigation actions. As a living document, hazard problem statements and mitigation activities will be updated through MAST. The detail in Table 7-13 meets the regulatory requirements of FEMA and DMA 2000.

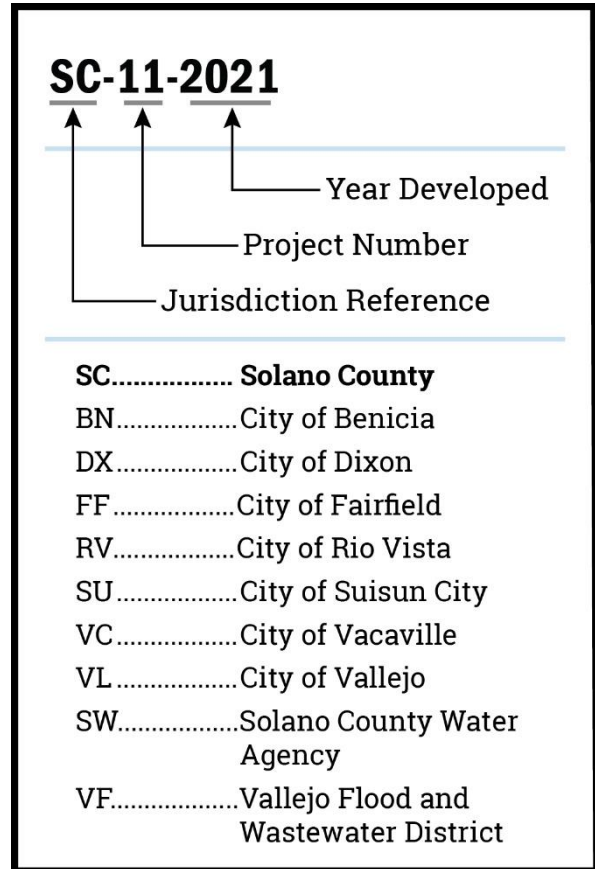


Figure 7-15: Mitigation Action Key



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Table 7-13: City of Vallejo Mitigation Actions

Mitigation No.	Hazard Type	Mitigation Type	Status	Year	Primary Agency	Title/Description	Responsible Party	Estimated Cost	Estimated Benefit	Time Frame	HMA Activity Type	Potential Grant Source	Priority	Related Goal(s)	Related Problem Statements
ma-EW-VL-158	All Hazard	PRV - Prevention	Pending	2021	City of Vallejo	Implement a defensible space assessment, including for key wind corridors or areas more susceptible to wildfire carried by extreme wind.	City of Vallejo	Medium - The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.	High - Project will provide an immediate reduction of risk exposure for life and property.	Annually	Project	HMGP / BRIC	High	Goal 1: People , Goal 2: Infrastructure , Goal 4: Resilience	ps-EW-VL-77, ps-WF-VL-60, ps-WF-VL-63
ma-CC-VL-203	Climate Change	PRV - Prevention	Ongoing	2021	City of Vallejo	Incorporate consideration of sea level rise into the City's Capital Improvement Program, and into the design and funding of infrastructure in places of higher risk such as Mare Island.	City of Vallejo	Medium - The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.	High - Project will provide an immediate reduction of risk exposure for life and property.	1-3 Years	Planning	HMGP / BRIC , FMA	High	Goal 4: Resilience	ps-CC-VL-181
ma-DR-VL-149	Drought	PRV - Prevention	Pending	2021	City of Vallejo	Replace irrigated landscaping with drought resistant vegetation and increase use of recycled water for irrigation.	City of Vallejo	Medium - The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.	High - Project will provide an immediate reduction of risk exposure for life and property.	3-5 Years	Project	HMGP / BRIC	High	Goal 3: Environment , Goal 4: Resilience	ps-DR-VL-74
ma-EQ-VL-150	Earthquake	PRV - Prevention	Pending	2021	City of Vallejo	Draft natural gas shut-off valve ordinance.	City of Vallejo	Medium - The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.	High - Project will provide an immediate reduction of risk exposure for life and property.	1-3 Years	Planning	HMGP / BRIC	High	Goal 1: People , Goal 2: Infrastructure	ps-EQ-VL-64
ma-EQ-VL-151	Earthquake	SP - Structural Projects	Pending	2021	City of Vallejo	Install seismic shut-off valves on gas fixtures on City-owned critical facilities and lines.	City of Vallejo	Medium - The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.	High - Project will provide an immediate reduction of risk exposure for life and property.	1-3 Years	Project	HMGP / BRIC	High	Goal 2: Infrastructure	ps-EQ-VL-65

Mitigation No.	Hazard Type	Mitigation Type	Status	Year	Primary Agency	Title/Description	Responsible Party	Estimated Cost	Estimated Benefit	Time Frame	HMA Activity Type	Potential Grant Source	Priority	Related Goal(s)	Related Problem Statements
ma-EQ-VL-152	Earthquake	SP - Structural Projects	Pending	2021	City of Vallejo	Conduct seismic retrofits of city-owned buildings and infrastructure, and reinforce soil to withstand liquefaction near vulnerable facilities on ground with very high liquefaction potential.	City of Vallejo	Medium - The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.	High - Project will provide an immediate reduction of risk exposure for life and property.	Annually	Project	HMGP / BRIC	High	Goal 2: Infrastructure	ps-EQ-VL-66, ps-EQ-VL-68, ps-EQ-VL-69
ma-EQ-VL-153	Earthquake	PRV - Prevention	Pending	2021	City of Vallejo	Update the Emergency Action Plans for dams throughout the City of Vallejo.	City of Vallejo	Medium - The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.	High - Project will provide an immediate reduction of risk exposure for life and property.	1-3 Years	Planning	HMGP / BRIC	High	Goal 1: People , Goal 2: Infrastructure , Goal 4: Resilience	ps-EQ-VL-67
ma-EQ-VL-154	Earthquake	SP - Structural Projects	Pending	2021	City of Vallejo	Retrofit water storage facilities to withstand seismic events	City of Vallejo	Medium - The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.	High - Project will provide an immediate reduction of risk exposure for life and property.	1-3 Years	Project	HMGP / BRIC	High	Goal 2: Infrastructure	ps-EQ-VL-70
ma-EQ-VL-155	Earthquake	PE&A - Public Education & Awareness	Pending	2021	City of Vallejo	Conduct public education campaign on earthquake preparedness and seismic housing retrofits.	City of Vallejo	Medium - The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.	High - Project will provide an immediate reduction of risk exposure for life and property.	Annually	Planning	HMGP / BRIC	Medium	Goal 1: People , Goal 4: Resilience	ps-EQ-VL-71, ps-EQ-VL-72, ps-EQ-VL-73
ma-EW-VL-156	Extreme Weather	ES - Emergency Services	Pending	2021	City of Vallejo	Construct backup generators at critical facilities (city pump stations) to prepare for loss of power from PSPS high wind events.	City of Vallejo	Medium - The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.	High - Project will provide an immediate reduction of risk exposure for life and property.	1-3 Years	Project	HMGP / BRIC	High	Goal 2: Infrastructure	ps-EW-VL-75

Mitigation No.	Hazard Type	Mitigation Type	Status	Year	Primary Agency	Title/Description	Responsible Party	Estimated Cost	Estimated Benefit	Time Frame	HMA Activity Type	Potential Grant Source	Priority	Related Goal(s)	Related Problem Statements
ma-FL-VL-157	Extreme Weather	SP - Structural Projects	Pending	2021	City of Vallejo	Reinforce drainage systems from flooding through protection activities, including elevating City infrastructure and roads, installing culverts beneath roads or building a higher bridge across areas that experiences regular flooding.	City of Vallejo	Medium - The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.	High - Project will provide an immediate reduction of risk exposure for life and property.	3-5 Years	Project	HMGP / BRIC	Medium	Goal 2: Infrastructure	ps-EW-VL-76
ma-EW-VL-159	Extreme Weather	PRV - Prevention	Pending	2021	City of Vallejo	Replace dying or dead evergreen vegetation with wind resistant vegetation and implement annual tree trimming program.	City of Vallejo	Medium - The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.	High - Project will provide an immediate reduction of risk exposure for life and property.	Annually	Project	HMGP / BRIC	High	Goal 2: Infrastructure , Goal 3: Environment	ps-EW-VL-78
ma-WF-VL-160	Wildfire	PE&A - Public Education & Awareness	Pending	2021	City of Vallejo	Conduct public education campaign on wildfire preparedness and defensible space measures for people living in moderate wildfire risk areas of Vallejo.	City of Vallejo	Medium - The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.	High - Project will provide an immediate reduction of risk exposure for life and property.	1-3 Years	Planning	HMGP / BRIC	High	Goal 1: People , Goal 4: Resilience	ps-WF-VL-61, ps-WF-VL-62
ma-WF-VL-161	Wildfire	PRV - Prevention	Pending	2021	City of Vallejo	Implement annual fuel reduction program for city-owned open spaces, including Waterfront Park and Don Hunts park.	City of Vallejo	Medium - The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.	High - Project will provide an immediate reduction of risk exposure for life and property.	Annually	Project	HMGP / BRIC	High	Goal 3: Environment , Goal 4: Resilience	ps-WF-VL-63



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SECTION 8

JURISDICTIONAL ANNEX:

Solano County Water Agency



SOLANO COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

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FINAL for adoption



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Solano County

Multi-Jurisdiction Hazard Mitigation Plan

SOLANO COUNTY WATER AGENCY (SCWA.)

Special District Annex

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Adoption Resolution

To comply with DMA 2000, the Solano County Water Agency has officially adopted this Solano County Multi-Jurisdictional Hazard Mitigation Plan (MJHMP), Volume 1, and its jurisdictional annex. The adoption of the MJHMP recognizes the Agency’s commitment to reducing the impacts of natural hazards. See included adoption resolution.

RESOLUTION NUMBER 2022-04

ADOPTING THE SOLANO COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN AND SOLANO COUNTY WATER AGENCY ANNEX

WHEREAS the Solano County Water Agency seeking FEMA approval of hazard mitigation plan, a political subdivision of the State of California, is an official participating jurisdiction in the updated Solano County Multi-Jurisdictional Hazard Mitigation Plan (“MJHMP”), and;

WHEREAS the Solano County Water Agency recognizes the updated MJHMP as the official hazard mitigation plan for participating jurisdictions, and;

WHEREAS the Solano County Water Agency has gathered information and prepared the updated MJHMP in accordance with Federal Emergency Management Agency (FEMA) requirements at 44 CFR § 201.6, and;

WHEREAS Volume 1 of the updated MJHMP recognizes the threat that natural hazards pose to people and property Solano County-wide, and;

WHEREAS the Solano County Water Agency’s Annex to Volume 1 of the updated MJHMP provides additional information specific to the Solano County Water Agency, with a focus on providing additional details on the planning process, risk assessment, and mitigation strategy for this community, and;

WHEREAS the Solano County Water Agency has reviewed Volume 1 of the updated MJHMP and its Annex and affirms that the plan actions in Volume 1 and its Annex should reduce the potential for harm to people and property from future hazard occurrences within the community, and;

WHEREAS the U. S. Congress passed the Disaster Mitigation Act of 2000 (“Disaster Mitigation Act”) emphasizing the need for pre-disaster mitigation of potential hazards, and;

WHEREAS the Disaster Mitigation Act made available mitigation grants to state and local governments, and;

WHEREAS an adopted hazard mitigation plan is required as a condition of future funding for mitigation projects under multiple FEMA pre- and post-disaster mitigation grant programs, and;

WHEREAS the Solano County Water Agency fully participated in the FEMA-prescribed mitigation planning process to prepare this updated MJHMP, and;

WHEREAS the residents were afforded opportunities to comment and provide input in the updated MJHMP and the mitigation actions in the Plan, and;

WHEREAS the Solano County Water Agency, as a fully participating jurisdiction of the updated MJHMP, is an eligible sub-applicant to the State of California under FEMA’s hazard mitigation grant program guidance, and;

WHEREAS the California Office of Emergency Services (Cal OES), and the FEMA Region IX officials have reviewed the updated MJHMP, and approved it contingent upon this official adoption by the participating governing body, and;

WHEREAS the Solano County Water Agency desires to comply with the requirements of the Disaster Mitigation Act and to augment its emergency planning efforts by formally adopting the updated MJHMP, and;

WHEREAS adoption by the governing body for the Solano County Water Agency demonstrates the jurisdiction's commitment to fulfilling the mitigation goals and objectives outlined in this updated MJHMP, and;

WHEREAS adoption of this plan helps to coordinate the responsible agencies to carry out their responsibilities under the updated MJHMP.

NOW THEREFORE BE IT RESOLVED by the Board of Directors of the Solano County Water Agency:

This Board of Directors finds the facts mentioned above to be true and further finds that this Board of Directors has jurisdiction to consider, approve, and adopt the subject of this Resolution.

This Board of Directors does hereby adopt the updated Solano County Multi-Jurisdictional Hazard Mitigation Plan Volume 1 and its Annex, as approved by FEMA and Cal OES, as the official mitigation plan for the Solano County Water Agency.

This Board of Directors authorizes the Solano County Emergency Service Manager to submit an approved and signed copy of this adoption resolution to the California Office of Emergency Services and FEMA Region IX officials to enable the plan's final approval in accordance with the requirements of the Disaster Mitigation Act of 2000.

I, ROLAND SANFORD, General Manager and Secretary to the Board of Directors of the Solano County Water Agency, do hereby certify that the foregoing resolution was regularly introduced, passed and adopted by said Board of Directors, at a regular meeting thereof held on February 10, 2022, by the following vote:

Ayes: Director's Young, Bird, Price, Favero, Crossley, Kott, Hannigan, Brown, Spring, Vasquez, Mashburn, Klurge, Wilson and McConnell.

Noes: None.

Abstain: None.

Absent: Director Rowlett.



Roland Sanford

General Manager and Secretary to the Board of Directors of the Solano County Water Agency





Section 8. Solano County Water Agency

8.1 Purpose

This Annex details the hazard mitigation planning elements specific to the Solano County Water Agency. This Annex is not intended to be a standalone document but appends to and supplements the information contained in the umbrella plan document. As such, all sections of the umbrella plan, including the planning process and other procedural requirements apply to and were met by the Solano County Water Agency. This Annex provides additional information specific to the Solano County Water Agency, with a focus on providing additional details on the planning process, risk assessment, and mitigation strategy for this community.

Hazard Mitigation Plan Points of Contact

Primary Point of Contact

Jeff Barich, Senior Water Resources Engineer
Solano County Water Agency
810 Vaca Valley Pkwy #203,
Vacaville, CA 95688
Telephone: (707) 455-1109
e-mail: JBarich@scwa2.com

Alternate Point of Contact

Alex Rabidoux, Principal Water Resources Engineer
Solano County Water Agency
810 Vaca Valley Pkwy #203,
Vacaville, CA 95688
Telephone: (707) 455-1106
e-mail: ARabidoux@scwa2.com

8.2 Planning Methodology

The Solano County Water Agency followed the planning process detailed in Volume 1, Section 3, including participating in the County Hazard Mitigation Planning Committee (HMPC) and Steering Committee and formulating their own internal planning team to support the broader planning process. Internal planning participants, their positions, and how they participated in the planning process are shown in Table 8-1.

Table 8-1: Planning Committee Members

Planning Committee Members	Department
Jeff Barich	Senior Water Resources Engineer
Alex Rabidoux	Principal Water Resources Engineer
Roland Sanford	General Manager
Gustavo Cruz	Assistant Water Resources Engineer
Katherine Ashley	Administrative Assistant
Rich Marovich	Streamkeeper
Sandra Willingmyre	Accountant I
Thomas Pate	Water Policy Analyst/District Engineer

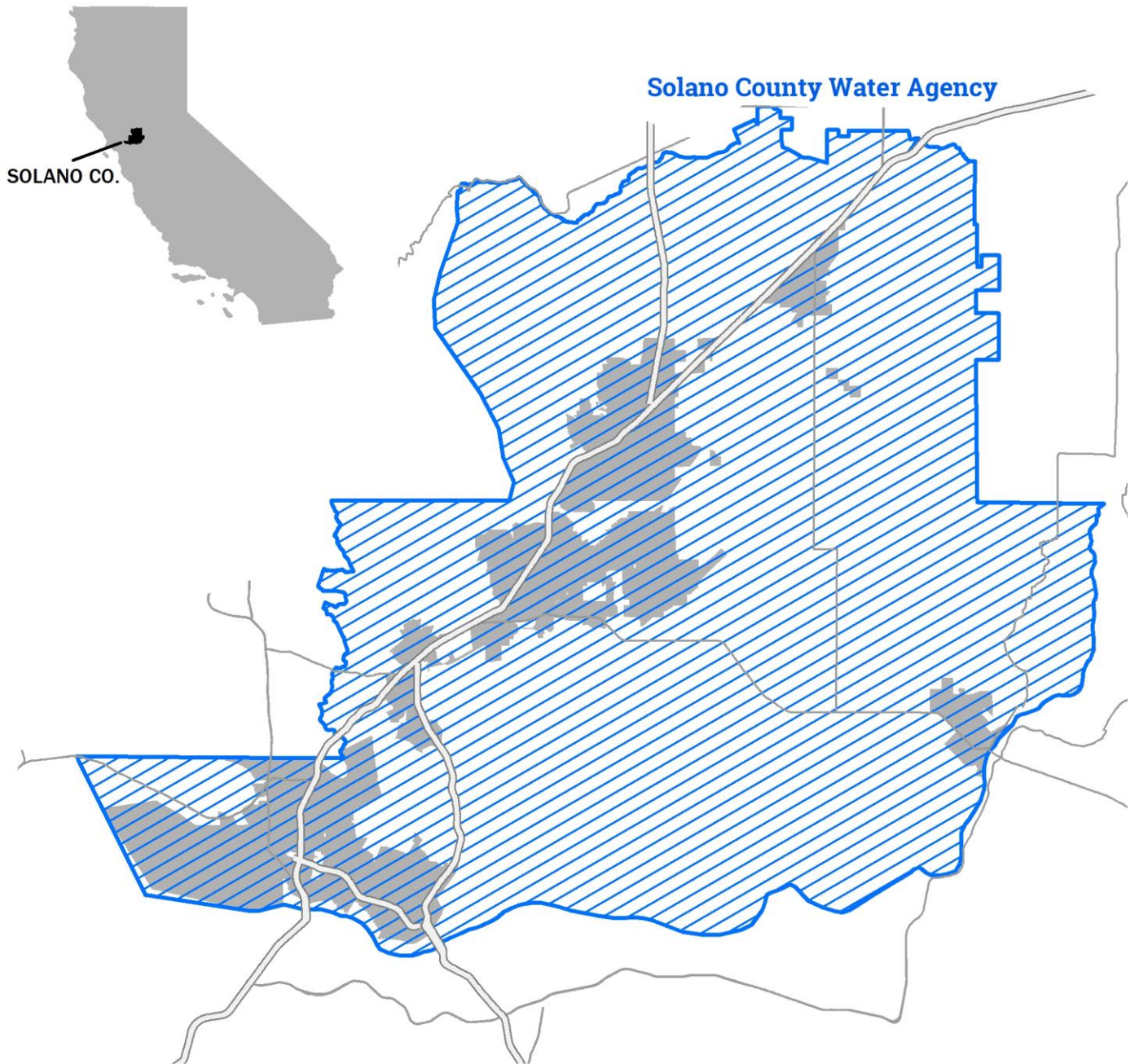


Figure 8-1: Solano County Water Agency Location



8.3 What's New

The Solano County Water Agency has not had a hazard mitigation plan since participating in the 2011 Association of Bay Area Governments MJHMP. Because the Agency's annex to the ABAG Plan is more than a decade old, no previous mitigation actions were included in this MJHMP. After the recent LNU Wildfire, SCWA has a better understanding of the benefits and importance of the HMP. Starting fresh will ensure that the Agency's mitigation strategy addresses its most pressing current vulnerabilities. The Agency's efforts to incorporate hazard mitigation planning into other planning mechanisms are documented in Section 8.5.1, the Capabilities Assessment.

Pleasants Creek Watershed Restoration:

SCWA and the Lower Putah Creek Coordinating Committee (LPCCC) constructed rock vanes to address erosion in Pleasants Creek following the 2020 LNU Lightning Complex wildfires. The Pleasants Creek watershed has contributed to approximately 90% of the sediment in Lake Solano and all points downstream. This has led to both water quality and water operation concerns with regards to the Solano Project, as well as ecosystem degradation to Putah Creek. The 2020 LNU Complex fires compounded these problems when it burned the entire Pleasants Creek



Figure 8-2: Rock Vanes Installed after LNU Fire by SCWA

Source: Solano County Water Agency

watershed and consequently increased the risk of erosion and downstream sedimentation. SCWA installed over 80 rock vanes along the floor of Pleasants Creek in 2020. Rock vanes trap sediment and raise the bed elevation of the channel, consequently rebuilding the floodplains and natural deposits. This benefits the natural ecosystem, groundwater levels, and the main water supply for Solano County. The success of this project frames the focus in this HMP Annex on additional needed erosion control work throughout the Lower Putah Watershed.

Generators for Redundant Power Supply: Beginning with the 2017 Atlas Fire and later by Public Safety Power Shutoffs by PG&E, there has been a strong need for a redundant power supply to the various North Bay Aqueduct (NBA) pumping plants. Currently, a portable generator is rented for over 6-months each year, to provide redundant power at the NBA Cordelia Pumping Plant. Beginning in 2022, SCWA and Napa County Flood anticipate spending over \$3 million for the purchase of a portable standby generator that can be used at either the Barker Slough Pumping Plant or Cordelia Pumping Plant locations. This increases resiliency during disaster events and especially during Public Service Power Shutoffs (PSPS) occurring during high wind events.



8.4 Risk Assessment

The intent of this section is to profile the Solano County Water Agency's hazards and assess the Agency's vulnerabilities, distinct from that of the County wide planning area. The hazard profiles in Volume 1 discuss overall impacts to the planning area and describes the hazard problem description, hazard extent, magnitude/severity, previous occurrences of hazard events and the likelihood of future occurrences. For more information on Risk Assessment Methodologies, see Vol. 1 and Appendix A.

8.4.1 Hazard Screening Criteria

Planning Team members from each participating jurisdiction collectively discussed which hazards should be profiled in the Plan and which should not. The results of that discussion can be found in Table 8-2. Detailed hazard profiles of the most significant County wide hazards are described in Section 4 of Volume 1. The Planning Team reviewed previously-prepared hazard mitigation plans and other relevant documents to determine the realm of natural hazards that have the potential to affect the Solano County Water Agency. Table 8-3 provides a crosswalk of hazards identified in Vol. 1 of this plan, the Solano County Water Agency General Plan, and 2018 California State Hazard Mitigation Plan. The crosswalk was used to develop a preliminary hazards list, providing a framework for the Planning Team members to evaluate which hazards were truly relevant to the Solano County Water Agency and which ones were not. Section 8.4.2 below describes the hazard risk ranking process that was performed by the planning team which prioritized hazards that are specifically relevant to the Solano County Water Agency.



Table 8-2: County-Wide Hazard Prioritization

Hazard Type	Explanation
Climate Change	High priority county-wide, profiled hazard.
Dam/ Levee failure	Dam failure is possible in Solano County but is best addressed in other plans, specifically Emergency Action Plans for high hazard dams affecting Solano County.
Drought	High priority county-wide, profiled hazard.
Earthquake/ Geologic Hazards	High priority county-wide, profiled hazard.
Flood	High priority county-wide, profiled hazard.
Hazardous Material	While hazardous materials can release and impact the County, there are better avenues to address this hazard outside this plan.
High Winds/ Straight Line Winds	High priority county-wide, profiled as part of Extreme Weather.
Insect Hazards	While hazardous insects exist in Solano County, this was not considered a priority and is not profiled in this plan.
Pandemic Disease	While pandemic disease can impact the County, there are better avenues to address this hazard outside this plan.
Extreme Weather, including:	High priority county-wide for high wind, heavy rain, and high heat.
Extreme Heat	Profiled as part of Extreme Weather.
Hail	Hail events are rare and not considered a priority.
High Wind	Profiled as part of Extreme Weather.
Heavy Rain	Profiled as part of Extreme Weather.
Fog	Fog events are rare and are not considered a priority.
Lightning	Not a priority as an extreme weather event; discussed as source of wildfire.
Severe Thunderstorm	Severe thunderstorms were not identified as a priority in this plan.
Winter Storm / Extreme Cold/ Freeze Events	Winter storms are rare in Solano County and not identified as a priority for this plan.
Slope Failure	High priority county-wide, profiled hazard.
Soil Hazards	While limited soil hazards exist in Solano County (erosion and shifting soils), these are not prioritized in this plan. Erosion discussed under flood hazard.
Terrorism/Human Caused Threats	While terrorism is certainly a threat to the County and participating jurisdictions, it is best addressed in other plans as this HMP does not address human-caused threats.
Tornado	Impacts to the County from tornados are extremely unlikely, if any.
Volcanic Activity	Due to distance from volcanoes and the limited chance of an eruption, this hazard was not identified as a priority.
Wildfire	High priority county-wide, profiled hazard.



Table 8-3: Document Review Crosswalk

Hazards	2008 Solano County General Plan	2015 Urban Water Management Plan	2014 Solano County HMP	2018 California State HMP
Agricultural Pests				■
Climate Change	■		■	■
Dam Failure	■	■	■	■
Drought		■	■	■
Earthquake	■	■	■	■
Extreme Weather			■	■
Flood	■		■	■
Landslide	■	■	■	■
Levee Failure	■			■
Manmade Hazards				■
Pandemic Disease				■
Sea Level Rise	■		■	■
Soil Hazards	■			■
Terrorism & Tech Hazards				■
Tsunami	■			■
Volcano				■
Wildfire	■		■	■

8.4.2 Hazard Risk Ranking

The Solano County Water Agency’s Planning Team used the same hazard prioritization process as the Solano County Hazard Mitigation Planning Committee. This process is described in detail in Section 4.3.1 of Vol. 1. Figure 8-3 displays the results of the hazard risk ranking exercise that was performed by the Planning Team. The Planning Team chose to assess the Solano County Water Agency’s vulnerability to the following hazards:

- Wildfire
- Flood
- Earthquake
- Extreme Weather (heavy rain)
- Drought
- Slope Failure
- Climate Change

All of these hazards have been profiled in Vol. 1 of this document. The purpose of this annex is to specifically address the Solano County Water Agency’s vulnerability to these specifically-identified hazards.



8.4.3 Vulnerability Assessment

Assessing vulnerabilities exposes the unique characteristics of individual hazards and begins the process of narrowing down which areas within the Solano County Water Agency are vulnerable to specific hazard events. The vulnerability assessment considered unique local knowledge of hazards and impacts and a GIS overlaying method for examining such vulnerabilities more in depth. Using these methods, participating jurisdictions estimated vulnerable populations, infrastructure, and potential losses from hazards.

8.4.3.1 Risk Assessment

Each participating jurisdiction developed a risk matrix that assessed the probability and impact of various hazards within the jurisdiction. Figure 8-3 is the jurisdiction's risk assessment, which was completed in part using the web based and interactive Risk Assessment Mapping Platform (RAMP), accessed via the project website at www.mitigatehazards.com. RAMP allows interactive discovery of robust risk, vulnerability, and exposure data developed especially for Solano County. RAMP is a mapping platform built specifically for mitigation planning. It displays County/jurisdiction facilities and buildings overlaid with natural hazards layers to bring interactivity and individual discovery to the GIS analysis performed for the MJHMP. See Vol. 1 for a detailed description of RAMP. The Planning Team used RAMP in meetings and as needed to understand vulnerabilities to the Solano County Water Agency. Users interactively filter facilities and buildings by natural hazard zones and/or construction characteristics.

The Solano County Water Agency identified particular vulnerabilities within the Lower Putah Creek Watershed immediately below Monticello Dam, for the watershed area between Monticello Dam and the Putah Diversion Dam. Much of the watershed consists of poorly consolidated materials, including mudstone and sandstone that lack strength and are prone to erosion. This is compounded with recent wildfire events that have left significant burn scars in the watershed. Much of the focus of the Agency's problem statements centers around erosion and sedimentation issues in the Lower Putah Creek Watershed. *See Section 8.4.3.4.* The mapping included as Figure 8-15 zooms in on major tributaries of the watershed overlaid with recent burn scars.



8.4.3.2 Snapshot Exposure Maps and Damage Estimation Tables

The included snapshot maps and damage estimation tables illustrate the Solano County Water Agency's vulnerability to specific hazards. Based on the risk assessment, the snapshot maps focus on those hazards prioritized by the jurisdiction. These maps helped the Planning Team understand the exposure of population, parcels, and critical infrastructure to specific hazards. Each map contains an exposure summary that displays the percent of the population, the improvement and content value of parcels, and the amount of critical infrastructure that is exposed to each respective hazard. For flood and earthquake, detailed damage estimations were conducted through FEMA's Hazus software and are shown in tabular form. Additional mapping is also included. Figures and tables include:

- Figure 8-4: Solano County Water Agency – Mean Fire Return Interval
- Figure 8-5: Solano County Water Agency - Wildfire Risk Exposure
- Figure 8-6: Solano County Water Agency - FEMA Flood Risk Exposure
- Table 8-4: Damage Estimate Summaries, 100YR Flood
- Table 8-5: Damage Estimate Summaries, 500YR Flood
- Figure 8-7: Solano County Water Agency– BAM 200 YR Flooding and Awareness Zones
- Figure 8-8: Solano County Water Agency– Concord Green Valley EQ Scenario (M6.8)
- Figure 8-9: Solano County Water Agency–Hayward Rodger's Creek EQ Scenario (M7.1)
- Table 8-6: Concord Green Valley Damage Estimate Summary
- Table 8-7: Hayward Rodger's Creek Damage Estimate Summary
- Figure 8-10: Solano County Water Agency– Areas with Potential for Liquefaction
- Figure 8-11: Solano County Water Agency– Fault Zones Areas of Required Investigation
- Figure 8-12: Solano County Water Agency– Average Annual Precipitation (1981-2012 Inches)
- Figure 8-13: Solano County Water Agency– Drought Severity Timeline for Solano County
- Figure 8-14: Solano County Water Agency– Landslide Risk Exposure
- Figure 8-15: Lower Putah Creek and Burn Perimeter Overlap
- Figure 8-16: Solano County Water Agency– RCP Comparison



Risk Assessment Matrix Definitions

PROBABILITY RATING

The likelihood of a hazard event occurring within a time period?

PROBABILITY	Highly Likely	Highly likely - 100% annual probability. Or likely to occur every year in your lifetime.
	Likely	Likely - Between 10 and 100% annual probability. Or will occur several times in your lifetime.
	Possible	Possible - Between 1 and 10% annual probability. Or likely to occur some time in your lifetime.
	Unlikely	Unlikely - Less than 1% annual probability. Or unlikely but possible to occur in your lifetime.

IMPACT RATING

In terms of injuries, damage, or death, would you anticipate impacts to be minor, limited, critical, or catastrophic when a significant hazard event occurs? The impact could be in terms of one hazard event (flooding from a culvert failure) or a large-scale event (multiple rivers flooding) in the same jurisdictional boundary.

IMPACT			
Minor	Limited	Critical	Catastrophic

- Minor** - Very few injuries, if any. Only minor property damage and minimal disruption on quality of life. Temporary shutdown of critical facilities.
- Limited** - Minor injuries only. Approx. 10% or less of property in disaster footprint damaged or destroyed. Complete shutdown of critical facilities for more than one day.
- Critical** - Multiple deaths/injuries possible. Between 25% and 50% of property in disaster footprint is damaged or destroyed. Complete shutdown of critical facilities for more than one week.
- Catastrophic** - High number of deaths/injuries possible. More than 50% of property in affected area damaged or destroyed. Complete shutdown of critical facilities for 30 days or more.

To concentrate resources on highest priority hazards, the jurisdictional planning team will focus on "High" and "Extreme" risk hazards in this annex. These hazards have higher probability and greater impact as it relates to the jurisdiction's planning area.

Hazard definitions are included in Vol. 1 of this plan.

Hazard Information / Legend:



Climate Change is prioritized for all jurisdictions.

Sea-Level Rise is a subhazard of climate change for some jurisdictions (County, Vallejo, Benicia, Suisun City, Fairfield).



Extreme Weather in Solano County includes high heat, high wind, and heavy rain.

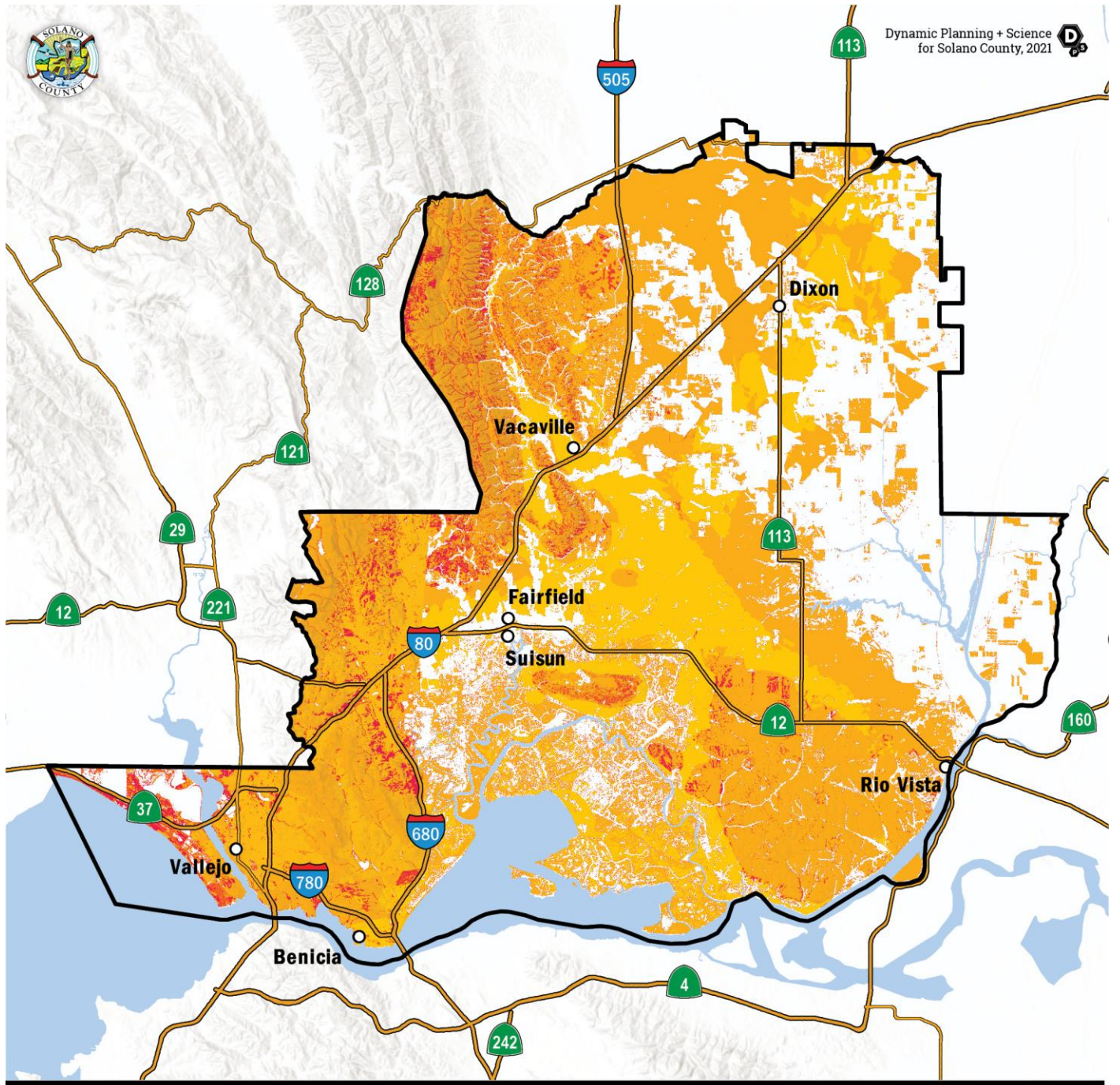


If a hazard symbol is grey, the planning team did not develop hazard vulnerability information due to lower perceived probability and impact.

SCWA Risk Matrix

		IMPACT			
		Minor	Limited	Critical	Catastrophic
PROBABILITY	Highly Likely	Medium	High	Extreme	Extreme
	Likely	Medium	Flood	Extreme Weather, Drought	Extreme
	Possible	Low	Medium	High	Earthquake
	Unlikely	Low	Low	Medium	Medium

Figure 8-3: Solano County Water Agency Risk Assessment



MEAN FIRE RETURN INTERVAL SOLANO COUNTY WATER AGENCY

*Data sources: USGS LANDFIRE.

AVERAGE PERIOD BETWEEN FIRES (YEARS)

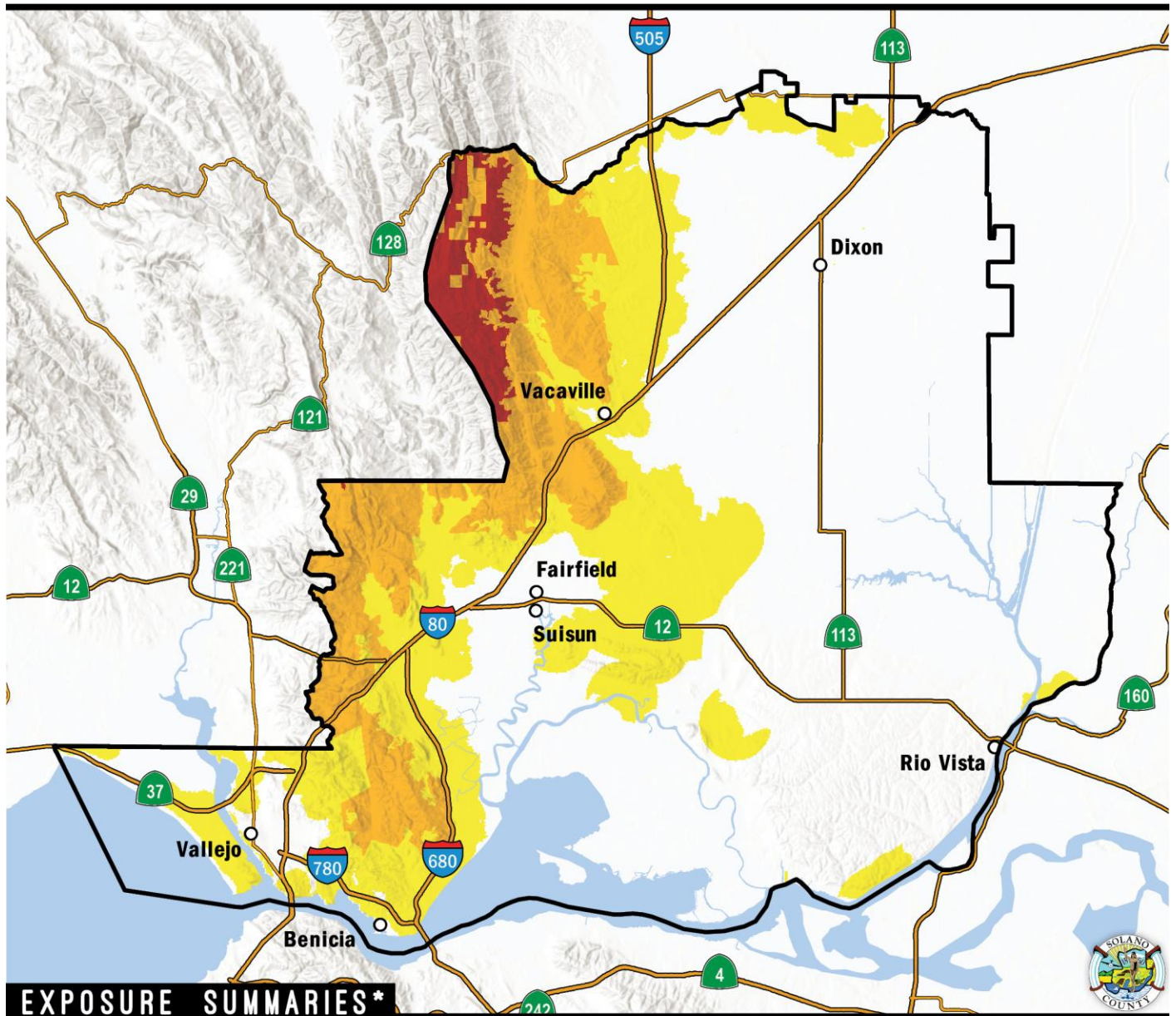


Figure 8-4: Solano County Water Agency – Mean Fire Return Interval



WILDFIRE RISK EXPOSURE

SOLANO COUNTY WATER AGENCY



EXPOSURE SUMMARIES*

POPULATION COUNT
IN HAZARD AREA

Count	Exp. Rate**
29,548	7%
Count Includes:	H VH

PARCEL COUNT
IN HAZARD AREA

Count	Exp. Rate**
2,500	2%
Count Includes:	H VH

PARCEL VALUE
IN HAZARD AREA

Sum of Improvement Value	Exp. Rate**
\$1,728,539,950	2%
Sum of Content Value	
\$881,151,779	2%
Count Includes:	H VH

CRITICAL INFRASTRUCTURE COUNTS
IN HAZARD AREA

Infrastructure Category	Count	Exp. Rate**	Count/Sum Includes:
Essential Facilities	0	0%	H VH
High Potential Loss	3	25%	Sum of Transportation & Lifeline Linear Mileage
Transportation & Lifeline	0	0%	1 2%

MAP LEGEND



*Exposure summaries include high and very high risk areas. Hazard data source: Cal Fire, CPUC.

**Exposure Rate - Exposed summary or count as a percentage of total summary or count within jurisdiction.

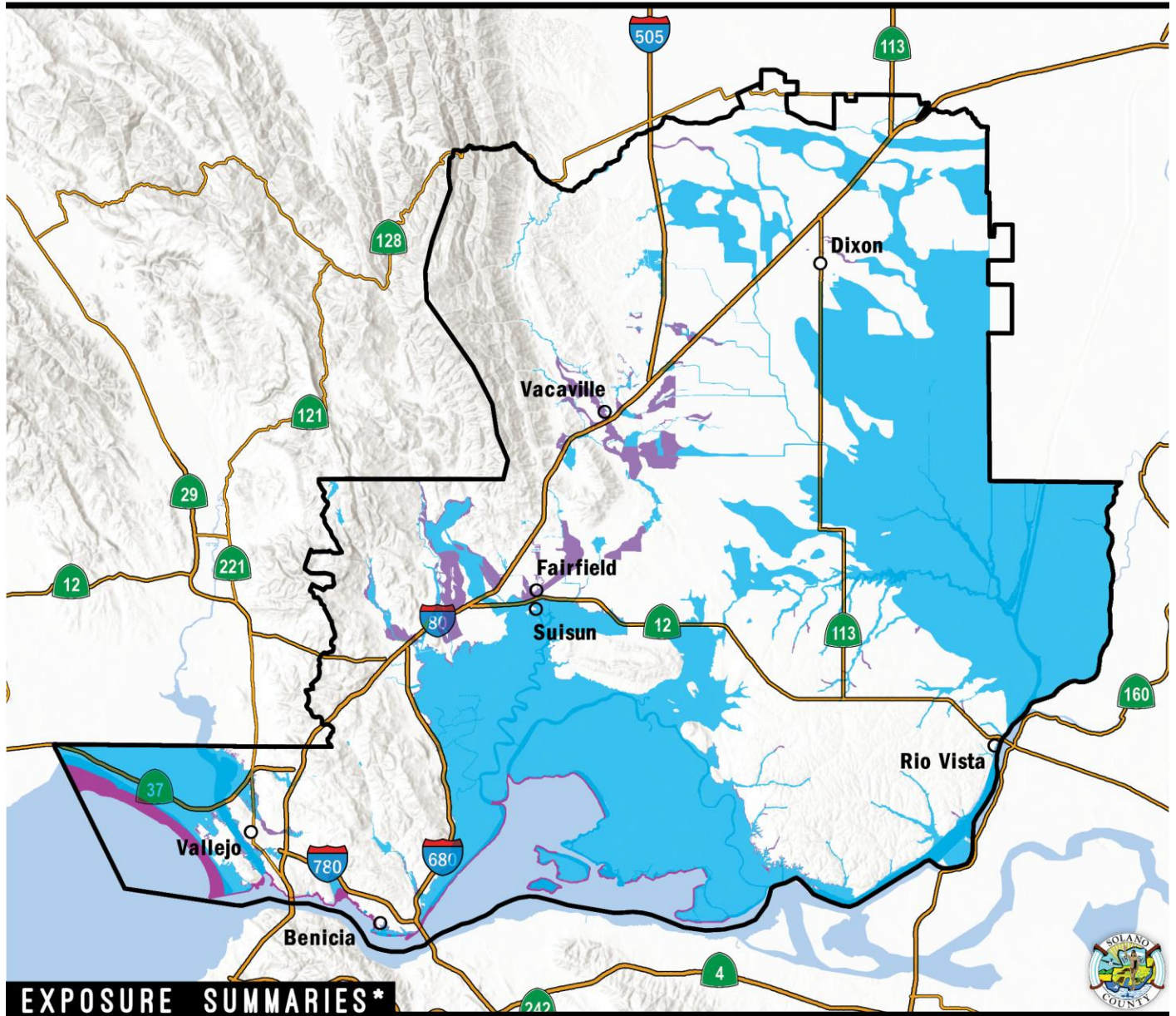
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Figure 8-5: Solano County Water Agency - Wildfire Risk Exposure



FEMA FLOOD RISK EXPOSURE

SOLANO COUNTY WATER AGENCY



EXPOSURE SUMMARIES*

POPULATION COUNT IN HAZARD AREA		PARCEL COUNT IN HAZARD AREA		PARCEL VALUE IN HAZARD AREA		CRITICAL INFRASTRUCTURE COUNTS IN HAZARD AREA			
Count	Exp. Rate**	Count	Exp. Rate**	Sum of Improvement Value	Exp. Rate**	Infrastructure Category	Count	Exp. Rate**	Count/Sum Includes:
91,196	21%	21,359	17%	\$11,630,904,570	16%	Essential Facilities	0	0%	100 + + 500
Count Includes: 100 + + 500		Count Includes: 100 + + 500		Sum of Content Value		High Potential Loss	2	17%	Sum of Transportation & Lifeline Linear Mileage
				\$7,311,557,097	15%	Transportation & Lifeline	0	0%	8 15%
				Count Includes: 100 + + 500					

MAP LEGEND

- 100-YR
- COASTAL
- AREA PROTECTED BY LEVEE
- 500-YR

*Exposure summaries include 100-year and 500-year flood zone areas, including coastal and leveed areas. Hazard data source: FEMA.
 **Exposure Rate - Exposed summary or count as a percentage of total summary or count within jurisdiction.

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Figure 8-6: Solano County Water Agency - FEMA Flood Risk Exposure



Table 8-4: Damage Estimate Summaries, 100YR Flood, Total Unincorporated County

Building Type	Building Damage (\$)	Building Damage (% of total loss)	Content Damage (\$)	Content Damage (% of total loss)	Total Damage (\$)	Proportion of Loss (%)
Agriculture	\$9,376,380	8.1%	\$13,882,650	11.9%	\$23,259,031	20%
Commercial	\$1,575,984	1.4%	\$3,614,943	3.1%	\$5,190,927	4%
Education*	\$0	0.0%	\$0	0.0%	\$0	0%
Emergency	\$0	0.0%	\$0	0.0%	\$0	0%
Government	\$53,252	0.0%	\$319,509	0.3%	\$372,761	0%
Industrial	\$891,820	0.8%	\$2,164,317	1.9%	\$3,056,138	3%
Religion	\$199,289	0.2%	\$1,551,641	1.3%	\$1,750,930	2%
Residential	\$63,816,768	54.8%	\$18,999,999	16.3%	\$82,816,767	71%
Total	\$75,913,494	65%	\$40,533,060	35%	\$116,446,553	

*School district asset information not available during time of Hazus analysis.

Note: Total Inventory Values

1 - Building Replacement Costs = \$3,773,922,295

2 - Content Replacement Costs = \$2,667,166,517

3 - Total Value = \$6,441,088,812

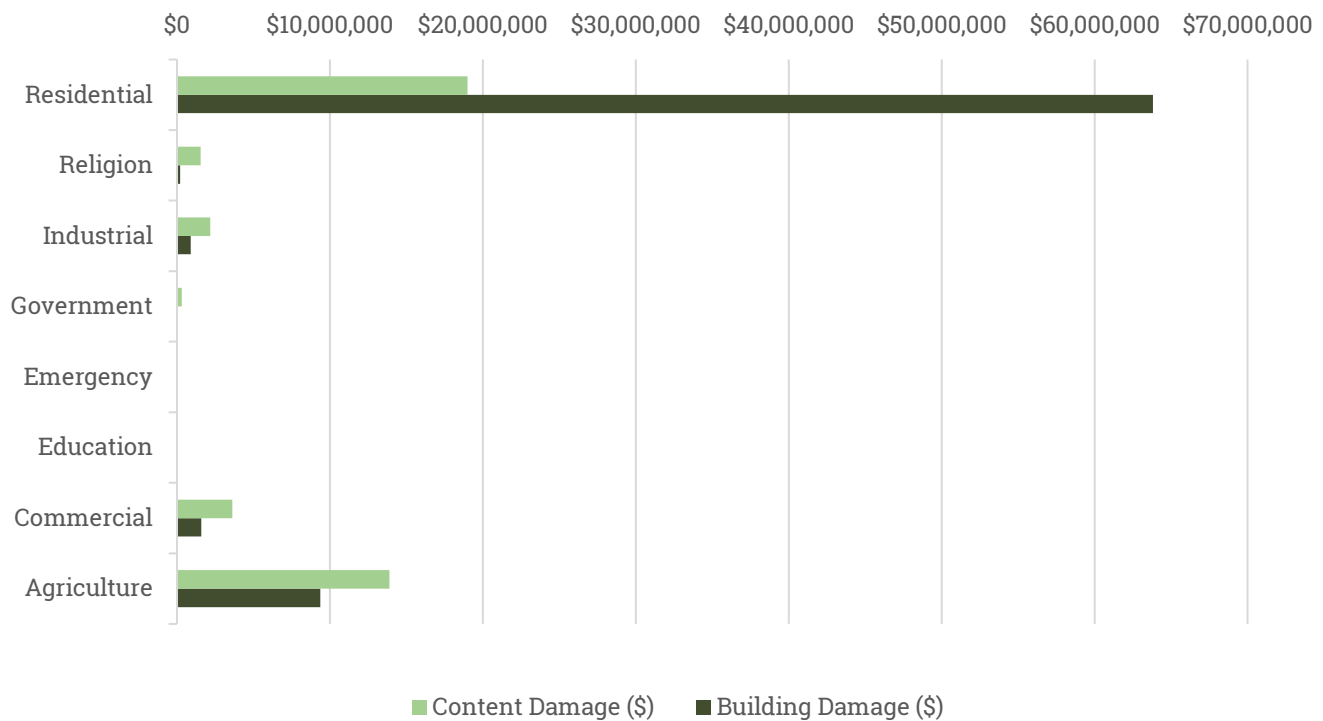




Table 8-5: Damage Estimate Summaries, 500YR Flood, Total Unincorporated County

Building Type	Building Damage (\$)	Building Damage (% of total loss)	Content Damage (\$)	Content Damage (% of total loss)	Total Damage (\$)	Proportion of Loss (%)
Agriculture	\$240,642	0.8%	\$958,992	3.1%	\$1,199,634	4%
Commercial	\$832,636	2.7%	\$2,755,509	8.9%	\$3,588,145	12%
Education*	\$0	0.0%	\$0	0.0%	\$0	0%
Emergency	\$0	0.0%	\$0	0.0%	\$0	0%
Government	\$2,035,426	6.6%	\$12,058,289	39.1%	\$14,093,715	46%
Industrial	\$0	0.0%	\$0	0.0%	\$0	0%
Religion	\$0	0.0%	\$0	0.0%	\$0	0%
Residential	\$8,953,888	29.0%	\$2,990,903	9.7%	\$11,944,791	39%
Total	\$12,062,592	39%	\$18,763,694	61%	\$30,826,286	

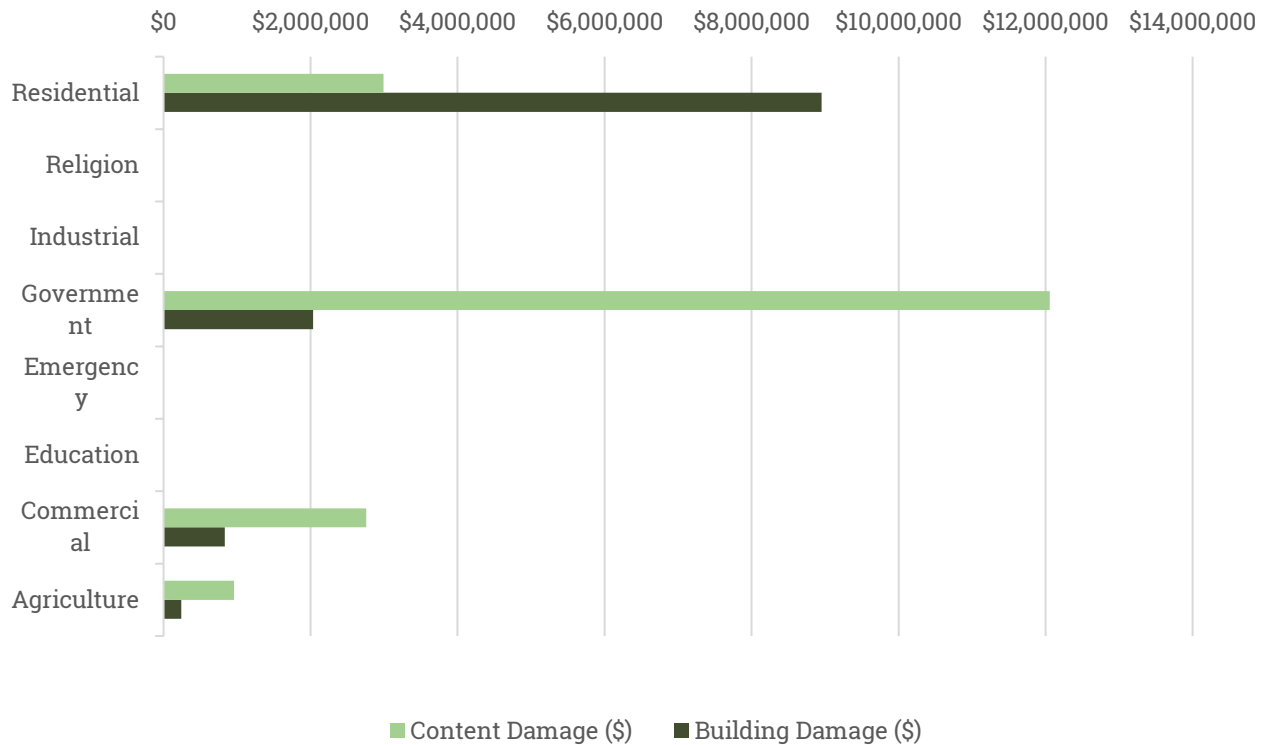
*School district asset information not available during time of Hazus analysis.

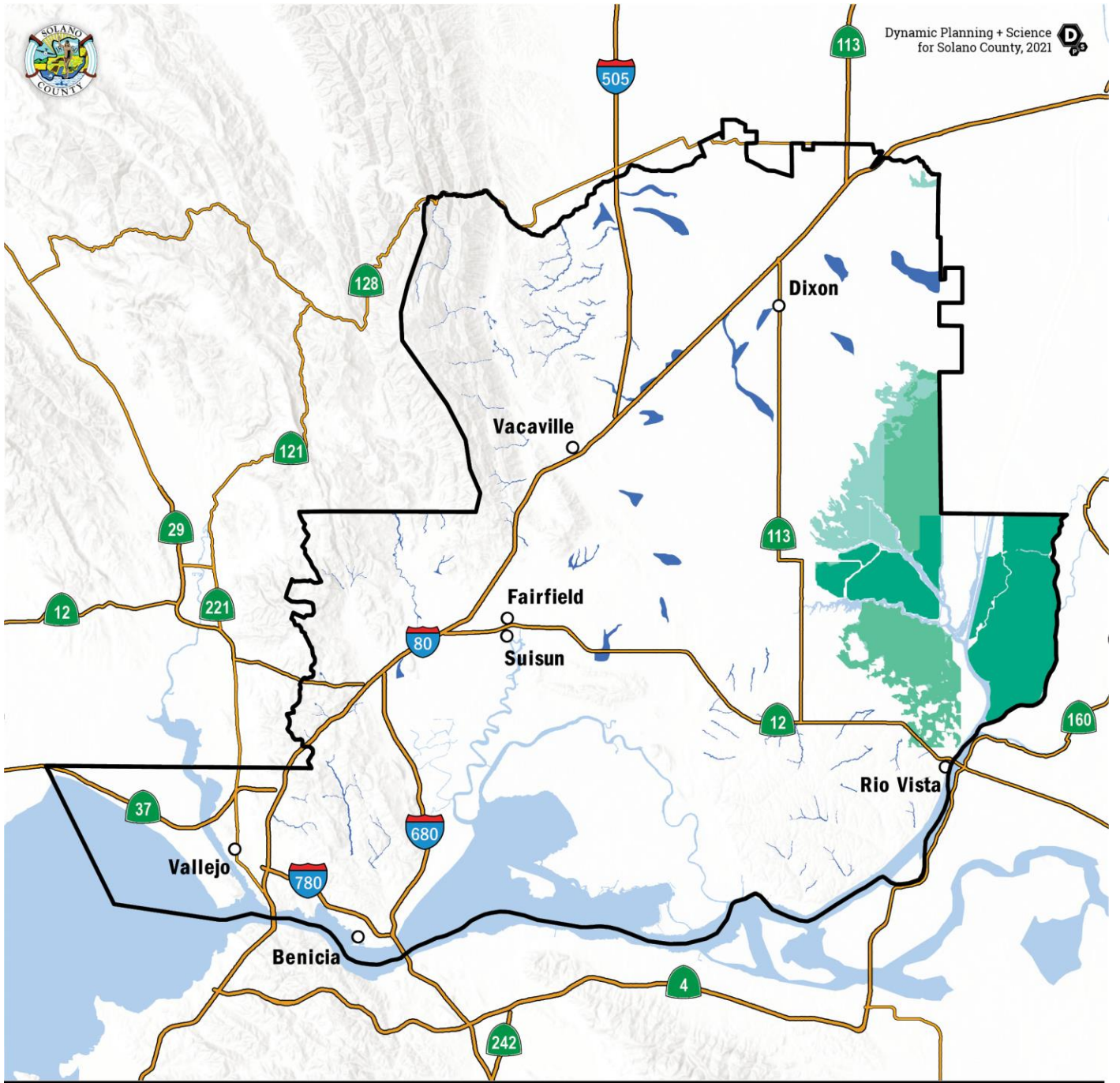
Note: Total Inventory Values

1 - Building Replacement Costs = \$3,773,922,295

2 - Content Replacement Costs = \$2,667,166,517

3 - Total Value = \$6,441,088,812





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BAM 200-YR FLOODING AND AWARENESS ZONES SOLANO COUNTY WATER AGENCY

*Data sources: DWR.

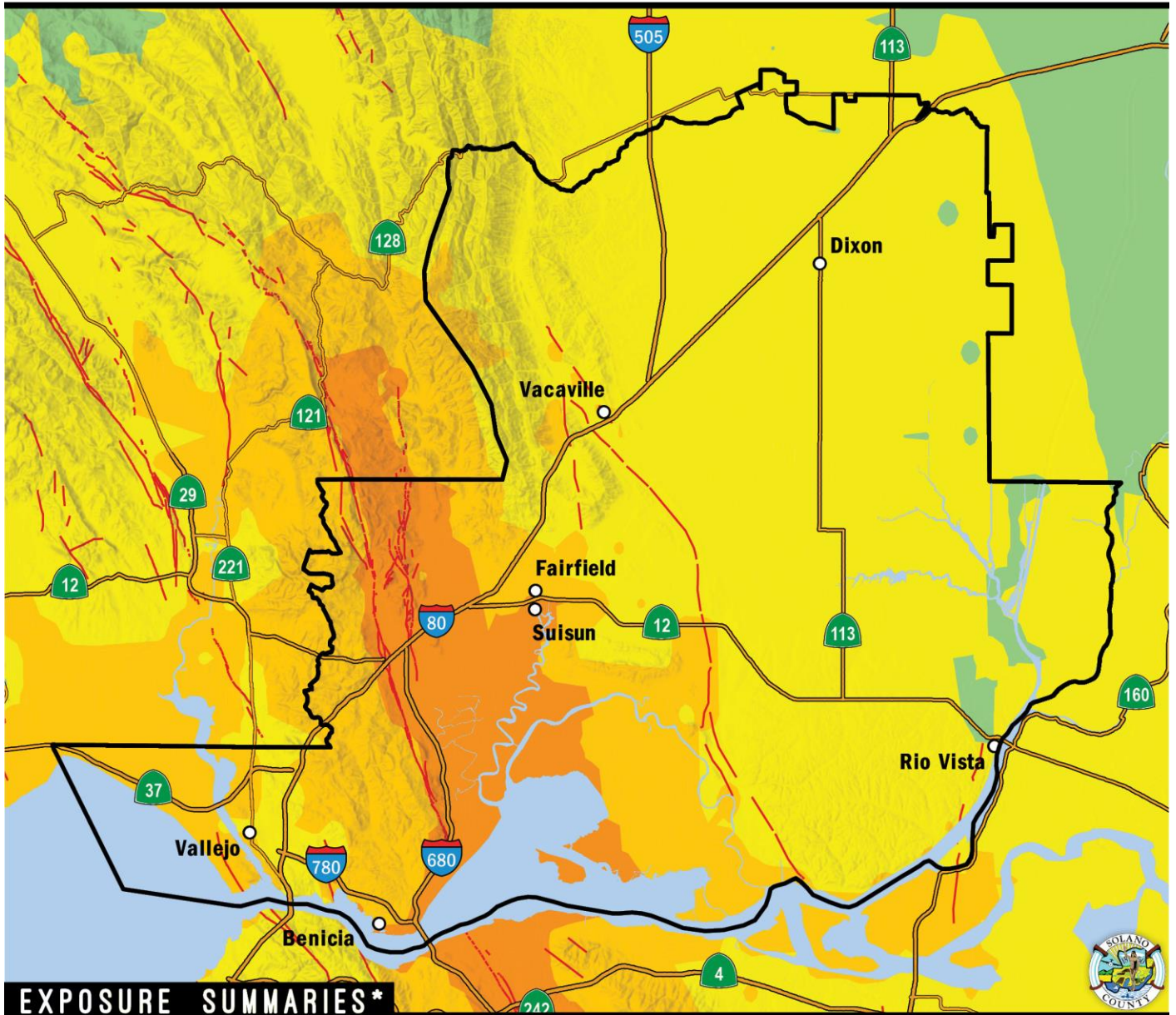
FEMA FLOOD ZONES		DWR AWARENESS ZONES	
100-YR (SFHA)	500-YR		
USACE SAC. SAN JOAQUIN R. COMPREHENSIVE STUDY			
100-YR	200-YR	500-YR	
Legend above represents all possible flood classes - may not be present on map			

Figure 8-7: Solano County Water Agency – BAM 200 YR Flooding and Awareness Zones



CONCORD-GREEN VALLEY EARTHQUAKE SCENARIO (M6.8)

SOLANO COUNTY WATER AGENCY



EXPOSURE SUMMARIES*

POPULATION COUNT IN HAZARD AREA

Count	Exp. Rate**
436,304	100%
Count Includes: S+++E	

PARCEL COUNT IN HAZARD AREA

Count	Exp. Rate**
125,217	97%
Count Includes: S+++E	

PARCEL VALUE IN HAZARD AREA

Sum of Improvement Value	Exp. Rate**
\$72,418,693,699	98%
Count Includes: S+++E	

Sum of Content Value	Exp. Rate**
\$46,914,178,307	98%
Count Includes: S+++E	

CRITICAL INFRASTRUCTURE COUNTS IN HAZARD AREA

Infrastructure Category	Count	Exp. Rate**	Count/Sum Includes:
Essential Facilities	0	0%	S+++E
High Potential Loss	12	100%	Sum of Transportation & Lifeline Linear Mileage
Transportation & Lifeline	0	0%	55100%

MAP LEGEND



*Exposure summaries include strong, very strong, violent, and severe MMI classes. Hazard data source: USGS.

**Exposure Rate - Exposed summary or count as a percentage of total summary or count within jurisdiction.

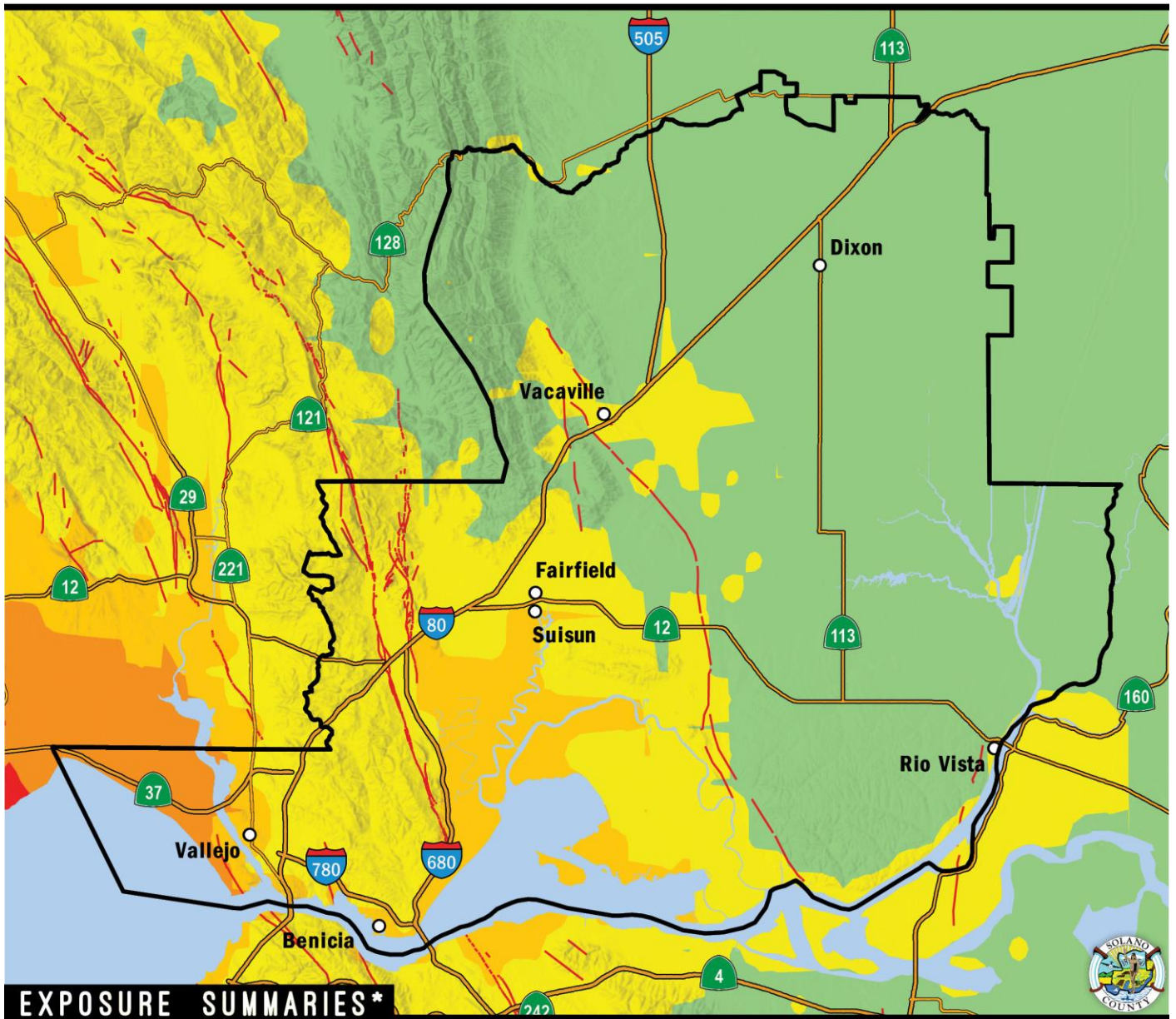
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Figure 8-8: Solano County Water Agency – Concord Green Valley EQ Scenario (M6.8)



HAYWARD-RODGER'S CREEK EARTHQUAKE SCENARIO (M7.1)

SOLANO COUNTY WATER AGENCY



EXPOSURE SUMMARIES*

POPULATION COUNT IN HAZARD AREA

Count	Exp. Rate**
340,617	78%
Count Includes: S+++E	

PARCEL COUNT IN HAZARD AREA

Count	Exp. Rate**
103,010	80%
Count Includes: S+++E	

PARCEL VALUE IN HAZARD AREA

Sum of Improvement Value	Exp. Rate**
\$57,956,676,571	78%
Sum of Content Value	Exp. Rate**
\$36,886,084,936	77%
Count Includes: S+++E	

CRITICAL INFRASTRUCTURE COUNTS IN HAZARD AREA

Infrastructure Category	Count	Exp. Rate**	Count/Sum Includes:
Essential Facilities	0	0%	S+++E
High Potential Loss	1	8%	Sum of Transportation & Lifeline Linear Mileage
Transportation & Lifeline	0	0%	



*Exposure summaries include strong, very strong, violent, and severe MMI classes. Hazard data source: USGS.

**Exposure Rate - Exposed summary or count as a percentage of total summary or count within jurisdiction.

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Figure 8-9: Solano County Water Agency–Hayward Rodger’s Creek EQ Scenario (M7.1)



Table 8-6: Concord Green Valley Damage Estimate Summary

Building Type	Average of Potential Damage to Exceed "Slight"	Average of Potential Damage to Exceed "Moderate"	Average of Potential Damage to Exceed "Extensive"	Average Economic Loss for Each Building Category	Sum of Economic Loss	Proportion of Loss (%)
SCWA Assets	19%	6%	1%	\$21,525	\$172,203	100%
Total					\$172,203	

Note: Total Inventory Values
 1 - Building Replacement Costs = \$3,792,585
 2 - Content Replacement Costs = \$3,287,781
 3 - Total Value = \$7,080,367

Table 8-7: Hayward Rodger's Creek Damage Estimate Summary (Unincorporated County)

Building Type	Average of Potential Damage to Exceed "Slight"	Average of Potential Damage to Exceed "Moderate"	Average of Potential Damage to Exceed "Extensive"	Average Economic Loss for Each Building Category	Sum of Economic Loss	Proportion of Loss (%)
SCWA Assets	6%	1%	0%	\$3,741	\$29,926	100%
Total					\$29,926	

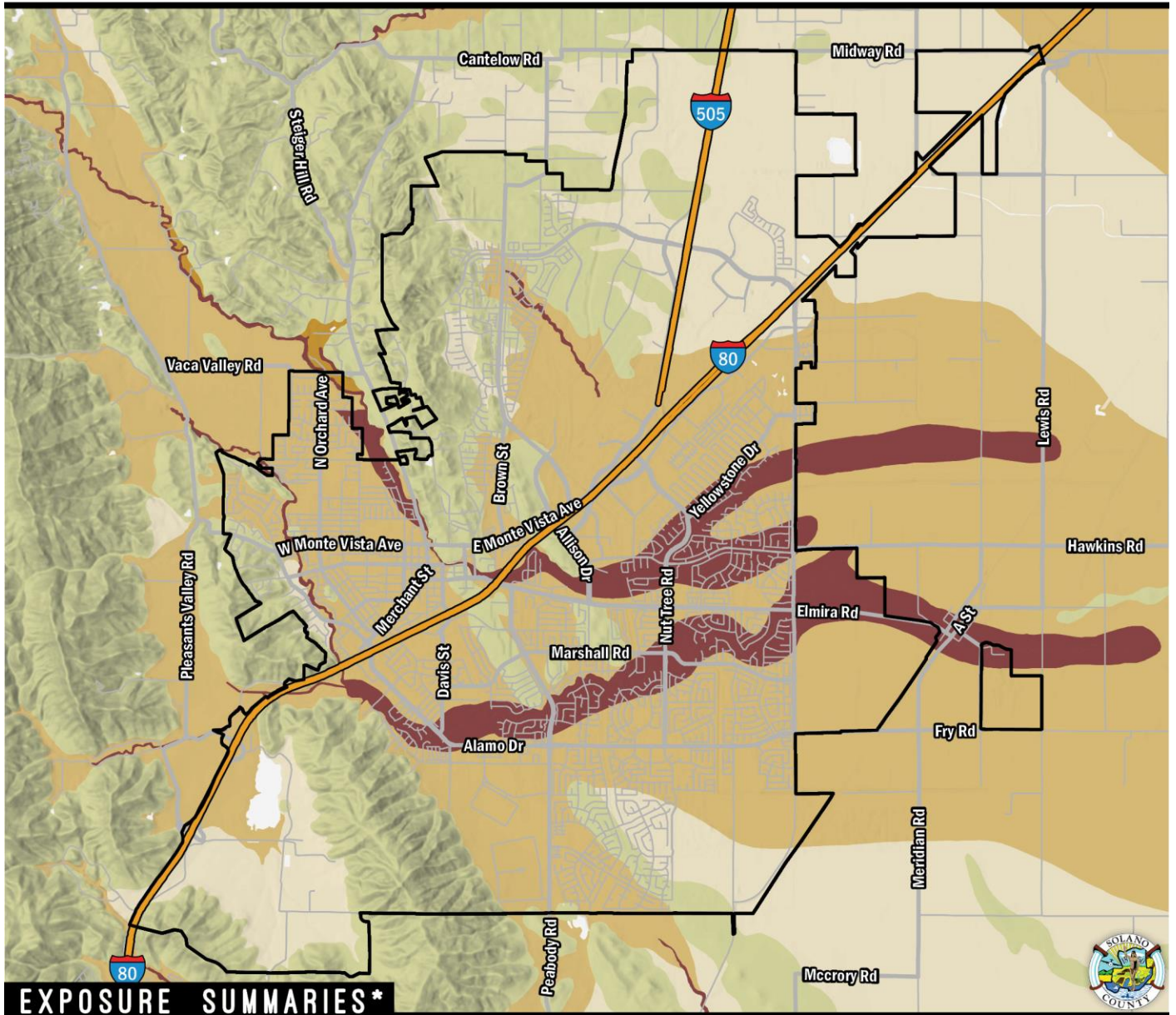
Note: Total Inventory Values
 1 - Building Replacement Costs = \$3,792,585
 2 - Content Replacement Costs = \$3,287,781
 3 - Total Value = \$7,080,367

For more detail on these assets and vulnerability to earthquake, see mitigatehazards.com/solanohmp/ramp/.



AREAS WITH POTENTIAL FOR LIQUEFACTION

VACAVILLE



EXPOSURE SUMMARIES*

POPULATION COUNT
IN HAZARD AREA

Count	Exp. Rate**
75,003	77%
Count Includes:	M H VH

PARCEL COUNT
IN HAZARD AREA

Count	Exp. Rate**
21,162	76%
Count Includes:	M H VH

PARCEL VALUE
IN HAZARD AREA

Sum of Improvement Value	Exp. Rate**
\$11,377,189,358	64%
Sum of Content Value	Exp. Rate**
\$6,715,399,890	57%
Count Includes:	M H VH

CRITICAL INFRASTRUCTURE COUNTS
IN HAZARD AREA

Infrastructure Category	Count	Exp. Rate**	Count/Sum Includes:
Essential Facilities	16	76%	M H VH
High Potential Loss	386	81%	
Transportation & Lifeline	404	80%	392 66%

Sum of Transportation & Lifeline Linear Mileage

MAP LEGEND

VL	L	M	H	VH
VERY LIGHT	LIGHT	MODERATE	HIGH	VERY HIGH

*Exposure summaries include medium, high, very high susceptibility. Hazard data source: USGS.

**Exposure Rate - Exposed summary or count as a percentage of total summary or count within jurisdiction.

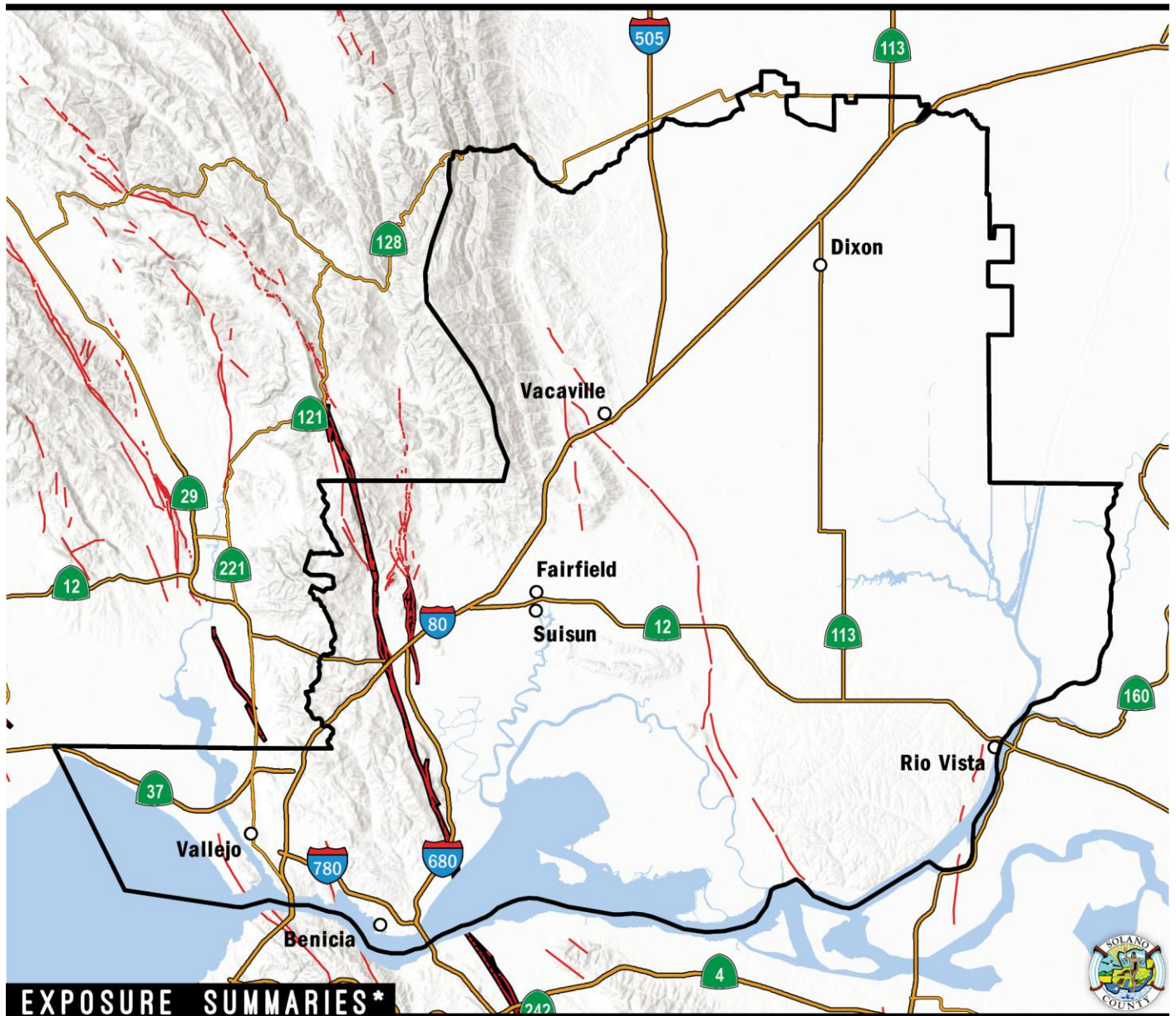
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Figure 8-10: Solano County Water Agency– Areas with Potential for Liquefaction



FAULT ZONE AREAS OF REQUIRED INVESTIGATION

SOLANO COUNTY WATER AGENCY



EXPOSURE SUMMARIES*

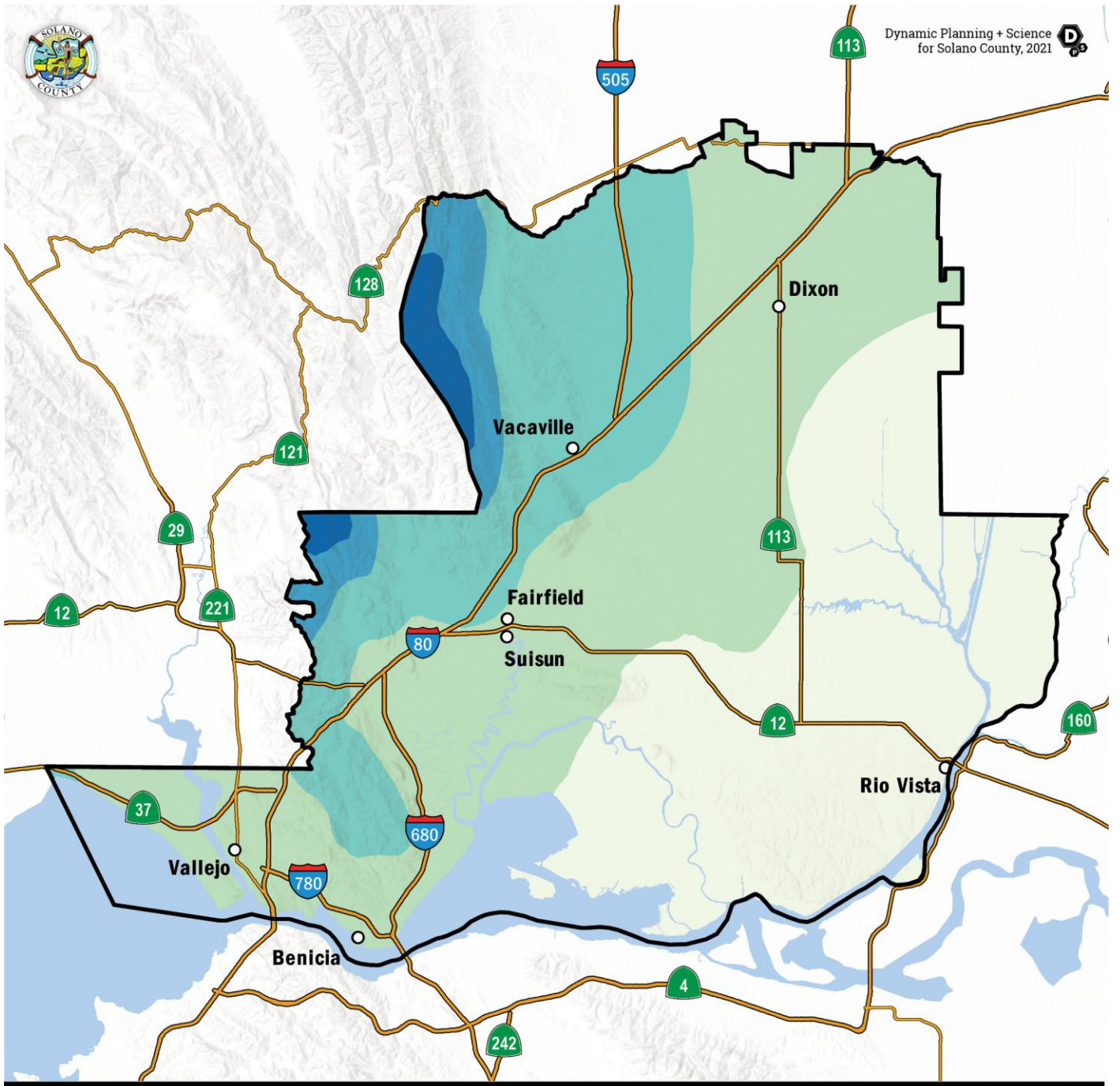
POPULATION COUNT IN HAZARD AREA		PARCEL COUNT IN HAZARD AREA		PARCEL VALUE IN HAZARD AREA		CRITICAL INFRASTRUCTURE COUNTS IN HAZARD AREA			
Count	Exp. Rate**	Count	Exp. Rate**	Sum of Improvement Value	Exp. Rate**	Infrastructure Category	Count	Exp. Rate**	Count/Sum Includes:
2,236	1%	1,183	1%	\$939,876,059	1%	Essential Facilities	0	0%	
Count Includes:		Count Includes:		Sum of Content Value		High Potential Loss	1	8%	Sum of Transportation & Lifeline Linear Mileage
				\$586,529,245	1%	Transportation & Lifeline	0	0%	1 3%
				Count Includes:					

- MAP LEGEND**
- QUATERNARY FAULTS (USGS)
 - EARTHQUAKE FAULT ZONE OF REQUIRED INVESTIGATION (CGS)

*Exposure summaries include within zone of investigation. Hazard data source: CGS.
 **Exposure Rate - Exposed summary or count as a percentage of total summary or count within jurisdiction.

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Figure 8-11: Solano County Water Agency– Fault Zones Areas of Required Investigation



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AVERAGE ANNUAL PRECIPITATION (1981-2010, INCHES)
SOLANO COUNTY WATER AGENCY

*Data sources: USDA - 1981-2010 Annual Average Precipitation by State.



Figure 8-12: Solano County Water Agency – Average Annual Precipitation (1981-2012 Inches)



Table 8-8: Drought Classifications and Impacts

Category	Description	Possible Impacts
D0	Abnormally Dry	<ul style="list-style-type: none"> Active fire season begins Going into drought, short term dryness, slowing planting, growth of crops or pastures. Coming out of drought, some lingering water deficits and pasture or crops not fully recovered,
D1	Moderate Drought	<ul style="list-style-type: none"> Some damage to crops, pastures Streams, reservoirs, or wells low, some water shortages developing or imminent Voluntary water-use restrictions requested
D2	Severe Drought	<ul style="list-style-type: none"> Crop or pasture losses likely Water shortages common Water restrictions imposed
D3	Extreme Drought	<ul style="list-style-type: none"> Major crop/ pasture losses Widespread water shortages or restrictions
D4	Exceptional Drought	<ul style="list-style-type: none"> Exceptional and widespread crop/ pasture losses Shortages of water in reservoirs, streams, and wells creating water

Adapted from U.S. Drought Monitor Drought Classifications and Impacts

Drought Severity Timeline

Solano County

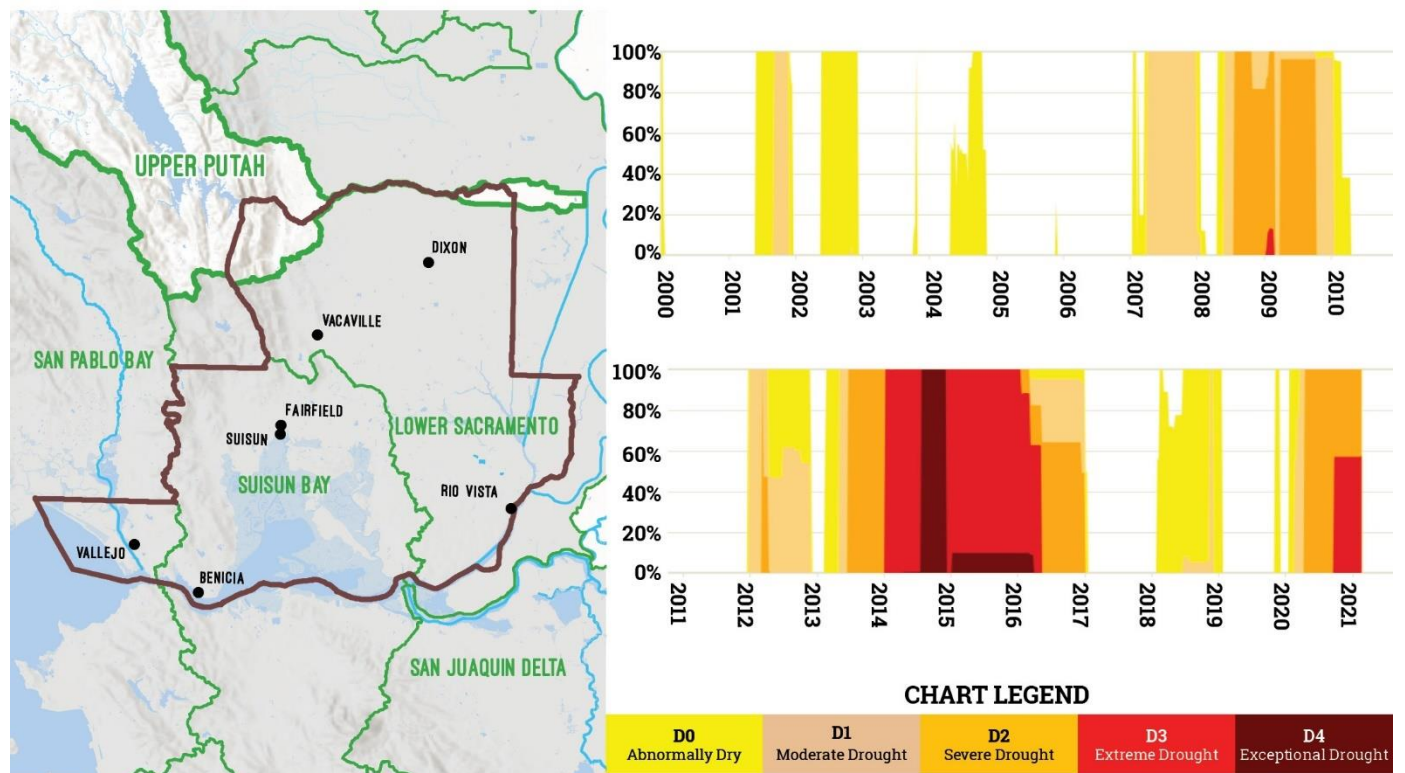
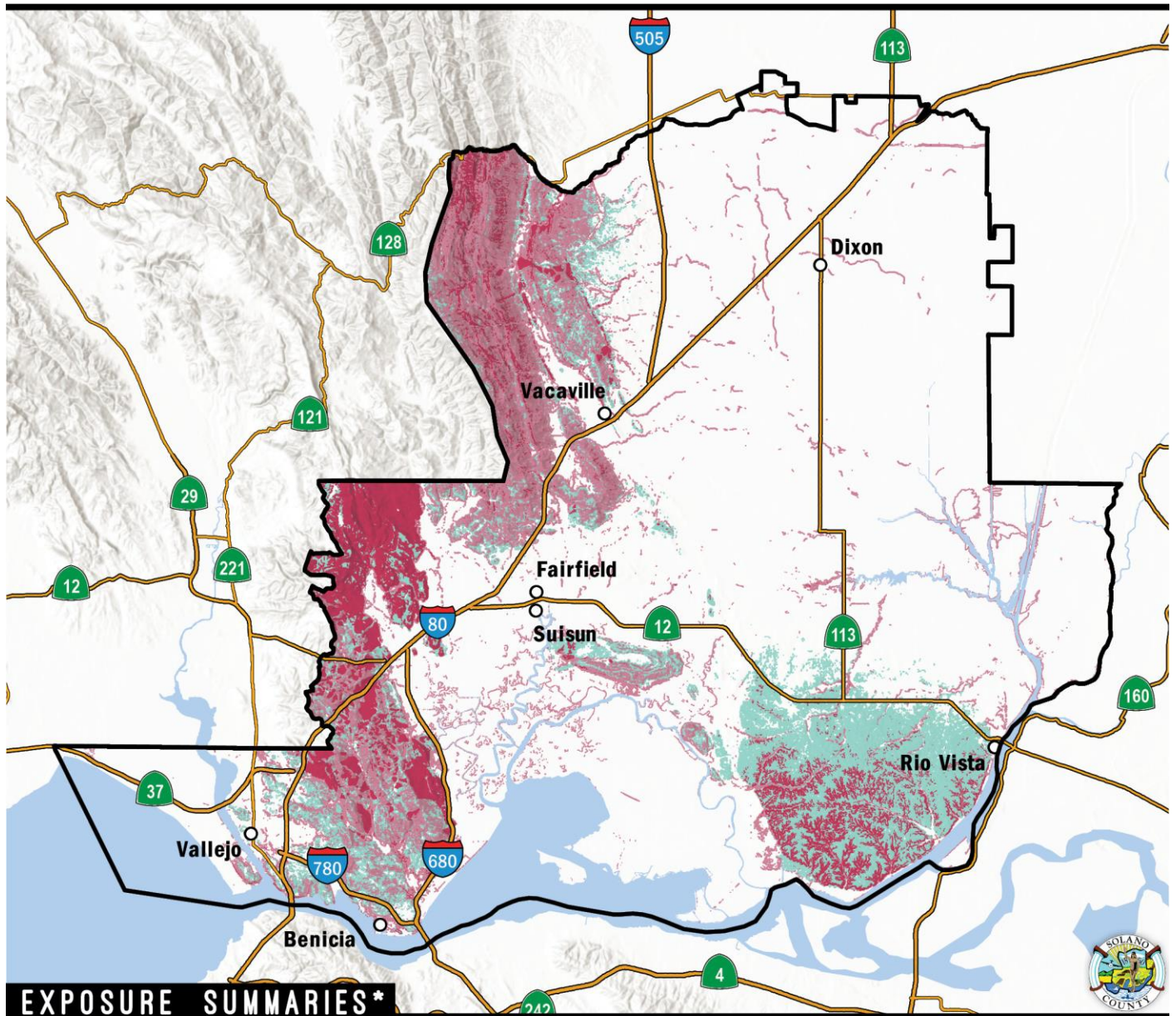


Figure 8-13: Solano County Water Agency– Drought Severity Timeline for Solano County



LANDSLIDE RISK EXPOSURE

SOLANO COUNTY WATER AGENCY



EXPOSURE SUMMARIES*

POPULATION COUNT IN HAZARD AREA		PARCEL COUNT IN HAZARD AREA		PARCEL VALUE IN HAZARD AREA		CRITICAL INFRASTRUCTURE COUNTS IN HAZARD AREA			
Count	Exp. Rate**	Count	Exp. Rate**	Sum of Improvement Value	Exp. Rate**	Infrastructure Category	Count	Exp. Rate**	Count/Sum Includes:
9,246	2%	1,090	1%	\$741,685,206	1%	Essential Facilities	0	0%	HIGH
Count Includes:	HIGH	Count Includes:	HIGH	Sum of Content Value		High Potential Loss	1	8%	Sum of Transportation & Lifeline Linear Mileage
				\$399,884,263	1%	Transportation & Lifeline	0	0%	3 5%
				Count Includes:	HIGH				

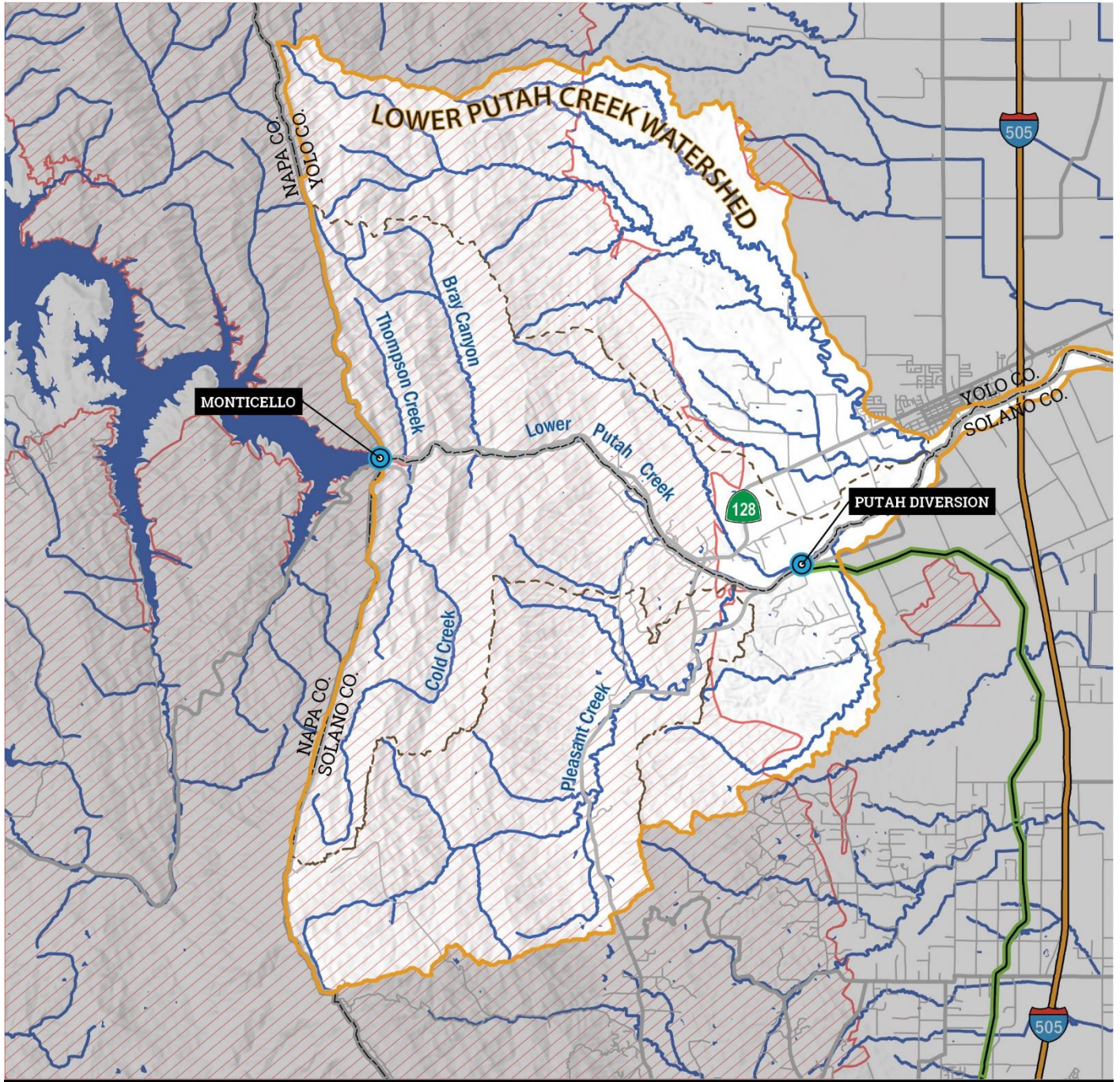
MAP LEGEND

LOW
MODERATE
HIGH

*Exposure summaries include high susceptibility only. Hazard data source: CGS.
**Exposure Rate - Exposed summary or count as a percentage of total summary or count within jurisdiction.

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Figure 8-14: Solano County Water Agency– Landslide Risk Exposure



LOWER PUTAH WATERSHED OVERVIEW
SOLANO COUNTY WATER AGENCY



Figure 8-15: Lower Putah Creek and Burn Perimeter Overlap

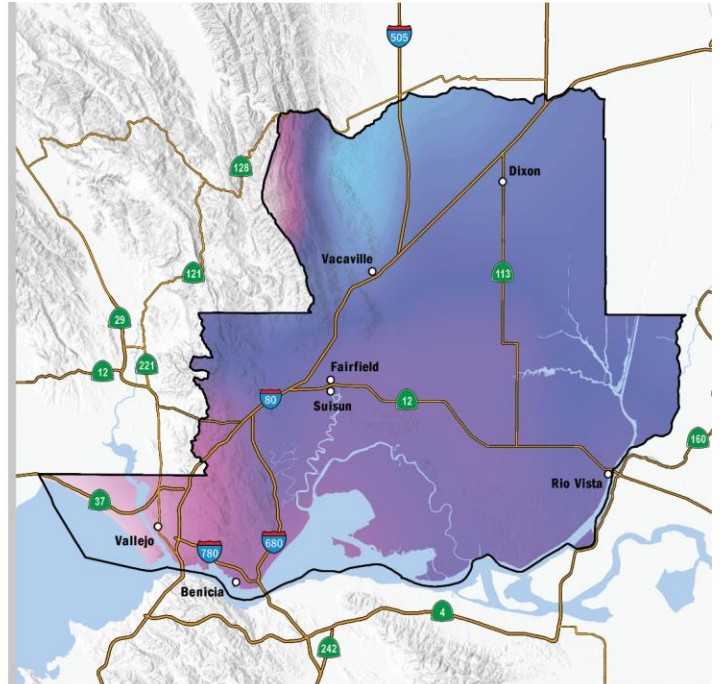


SOLANO COUNTY WATER AGENCY AVERAGE ANNUAL MAXIMUM TEMPERATURE

COMPARISON OF CURRENT OBSERVED TO RCP 4.5 AND RCP 8.5 SCENARIOS



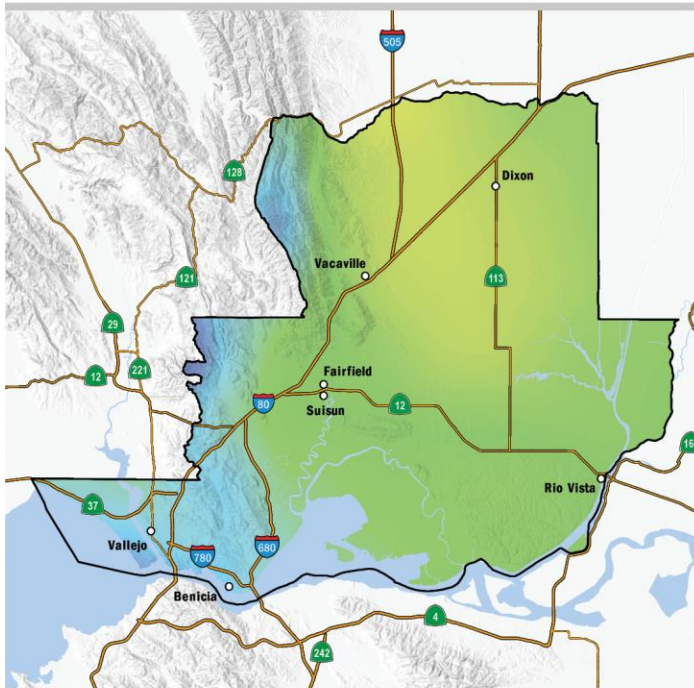
*Data sources: Cal-Adapt CanESM2 RCP 4.5 & 8.5, PRISM 30-YR Norms Annual Max Temp



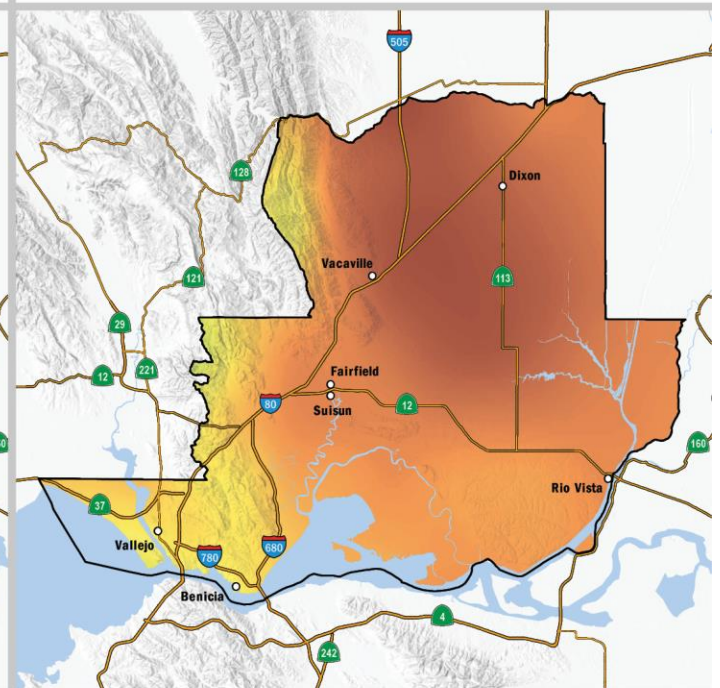
CURRENT 30-YR NORMAL



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RCP 4.5 YEAR 2100



RCP 8.5 YEAR 2100

Figure 8-16: Solano County Water Agency – RCP Comparison



8.4.3.3 Past and Future Development

The Solano County Water Agency is a special district focused on serving wholesale (untreated) water supplies for municipal and agriculture uses. The Agency operates and maintains two formal flood control facilities and shares flood management responsibilities in rural areas with Solano County. The Agency does not approve development within its established boundaries.

Note: as a special district, SCWA is not eligible to participate in the NFIP; therefore, no additional information about the NFIP is included in this annex.

Development since Previous HMP

The Agency has not completed a previous HMP; however, the Agency considered its growth over the last half decade, approximately, and identified several mitigation actions that substantially decreased its vulnerability to hazards. SCWA recently responded to the catastrophic 2020 LNU Lightning Complex fires by installing emergency rock vanes to prevent erosion that would create sediment loading in central water delivery infrastructure. SCWA also has been acquiring generators to ensure its ability to provide water to suppliers for 400,000 persons in Solano County during power outages. This HMP Annex reflects these substantial changes in past development and continues to focus on avenues to better mitigate impacts from problematic past development. This is especially important as the Agency does not regulate future development and instead provides services and infrastructure to such development.

Future Development

Future development is overseen and regulated by Solano County. The County's General Plan (GP) establishes long-range development policies. The GP provides a basis for private development proposals and public projects to remain consistent with existing city, regional, and state policies. The County's municipal codes includes regulations to mitigate the impact of hazards on new and existing development, including:

- Drainage and stormwater retention requirements,
- Steep slope restrictions for new development,
- Waterbody buffer requirements,
- Floodplain management regulations,
- Zoning that prevents development in hazardous areas of the community such as floodplains, landslide areas, the wildland-urban interface (WUI), or other known hazard areas, and
- Building codes that include the most up-to-date California Fire Code, seismic standards, and many other provisions crafted to protect new construction from hazard events.

See Vol. 1, Section 4.3.5, for additional information on past and future development in Solano County.



8.4.3.4 Identify Hazard Problem Statements

As part of the mitigation action identification process, the Planning Committee for each jurisdiction identified areas of concern (aka problem statements) for their respective facilities based on the risk assessment and vulnerability analysis, utilizing the RAMP mapping and static snapshot maps. Problem statements focused on the impact, victim, or threat that the hazard could create in the jurisdiction, as described in Figure 8-17. Identifying common issues and weaknesses through these problem statements assisted the Planning Committee in understanding the realm of resources needed for mitigation. Jurisdiction problem statements are listed in Table 8-9.

The goal is to have at least one mitigation action for every problem statement. Projects or actions have been developed to mitigate each problem identified. See Table 8-14 for a full list of mitigation actions and corresponding problem statements that they address. Each problem statement is coded with a problem number for cross-referencing between Table 8-9 and Table 8-14.



Figure 8-17: Guidance for Problem Statements



Table 8-9: Problem Statements

Problem No.	Hazard Type	Area of Concern	Mitigation Alternatives	Primary Agency	Problem Description	Related MA
ps-AH-SW-203	All Hazard	Impact	PRV - Prevention , SP - Structural Projects	Solano County Water Agency	Agency currently lacks generators in some facilities to ensure pumping and delivery of water.	ma-AH-SW-228
ps-AH-SW-204	All Hazard	Impact	PPRO - Property Protection , ES - Emergency Services , SP - Structural Projects	Solano County Water Agency	Emergency communications from Monticello Dam to Agency operations are outdated and lack redundancy.	ma-AH-SW-229
ps-WF-SW-205	Wildfire	Impact	PPRO - Property Protection , NRP - Natural Resource Protection , SP - Structural Projects	Solano County Water Agency	Wildfire exacerbates erosion and sedimentation, which in turn impacts water quality of raw water deliveries to Solano County.	ma-WF-SW-217
ps-WF-SW-206	Wildfire	Impact	SP - Structural Projects	Solano County Water Agency	Recent public safety power shutoff (PSPS) events have exacerbated the need for redundancy with generators.	ma-AH-SW-228
ps-SF-SW-207	Slope Failure	Impact	PRV - Prevention , NRP - Natural Resource Protection , SP - Structural Projects	Solano County Water Agency	Slope failure associated with heavy rain events causes heavy sedimentation in downstream canals and reservoirs.	ma-FL-SW-216
ps-DR-SW-209	Drought	Impact	PRV - Prevention , SP - Structural Projects	Solano County Water Agency	Agency currently lacks interties and redundancy between two systems, so have little flexibility during drought periods.	ma-DR-SW-230
ps-DR-SW-210	Drought	Impact	PRV - Prevention , PE&A - Public Education & Awareness , NRP - Natural Resource Protection	Solano County Water Agency	Drought potential worsens erosion issues in the South Putah Watershed. As Lake Berryessa gets low, large stormwater events after drought do not trigger flow releases into Putah Creek even while tributaries experience high flow events. Those tributary high flow events exacerbate erosion because they are flowing into a low-flow creek due to retained water at Lake Berryessa.	ma-FL-SW-216
ps-FL-SW-211	Flood	Impact	PRV - Prevention , NRP - Natural Resource Protection , SP - Structural Projects	Solano County Water Agency	Localized flooding in the Putah Creek Watershed creates significant erosion and sedimentation issues.	ma-FL-SW-216
ps-FL-SW-212	Flood	Victim	PPRO - Property Protection , SP - Structural Projects	Solano County Water Agency	Allendale area of unincorp Solano County includes many repetitive loss properties.	ma-FL-SW-232
ps-FL-SW-213	Flood	Threat	PRV - Prevention , SP - Structural Projects	Solano County Water Agency	SCWA continues to assist Rio Vista in flood protection through maintenance of the Mellon Levee and planning support.	ma-FL-SW-233



Problem No.	Hazard Type	Area of Concern	Mitigation Alternatives	Primary Agency	Problem Description	Related MA
ps-EW-SW-214	Extreme Weather	Impact	PRV - Prevention , NRP - Natural Resource Protection , SP - Structural Projects	Solano County Water Agency	Localized flooding from heavy rain events in the Putah Creek Watershed creates significant erosion and sedimentation issues.	ma-FL-SW-216, ma-FL-SW-236
ps-EW-SW-215	Extreme Weather	Impact	ES - Emergency Services	Solano County Water Agency	Localized flooding in Thompson Creek can block access to critical communication tower for Monticello Dam operations.	ma-FL-SW-216
ps-EW-SW-216	Extreme Weather	Impact	PRV - Prevention , NRP - Natural Resource Protection , SP - Structural Projects	Solano County Water Agency	Localized flooding impacting Putah Creek come from tributaries in both Solano and Yolo Counties.	ma-FL-SW-216, ma-FL-SW-236
ps-SF-SW-217	Slope Failure	Impact	PRV - Prevention , SP - Structural Projects	Solano County Water Agency	Severe erosion threatens culvert integrity and overlying bridges.	ma-FL-SW-216
ps-EW-SW-218	Extreme Weather	Impact	PRV - Prevention , SP - Structural Projects	Solano County Water Agency	Mitigation work in tributaries could be stymied by extensive dredge and fill permitting requirements.	ma-EW-SW-231, ma-FL-SW-236
ps-EW-SW-219	Extreme Weather	Impact	PRV - Prevention , NRP - Natural Resource Protection , SP - Structural Projects	Solano County Water Agency	Severe sedimentation can block raw water delivery canal, the Putah South Canal, and threaten water supplies for 400,000 persons.	ma-EW-SW-231, ma-FL-SW-216, ma-FL-SW-236
ps-CC-SW-220	Climate Change	Impact	PRV - Prevention , NRP - Natural Resource Protection , SP - Structural Projects	Solano County Water Agency	Climate change is predicted to increase rainfall amounts during heavy rainfall events, which in turn increased erosion and sedimentation in the Putah Creek Watershed.	ma-FL-SW-216
ps-CC-SW-221	Climate Change	Impact	PRV - Prevention , PE&A - Public Education & Awareness	Solano County Water Agency	Climate change predicted to worsen drought impacts that can impact water delivery by Agency.	ma-DR-SW-230, ma-DR-SW-234
ps-EQ-SW-222	Earthquake	Impact	PPRO - Property Protection , SP - Structural Projects	Solano County Water Agency	The Putah South Canal crosses two known fault lines and is susceptible to failures in the event of an earthquake.	ma-EQ-SW-235
ps-EQ-SW-223	Earthquake	Impact	PPRO - Property Protection , SP - Structural Projects	Solano County Water Agency	Both the N. Bay Aqueduct and Solano Project regional water supply projects are susceptible to failures in the event of an earthquake	ma-EQ-SW-237
ps-DR-SW-224	Drought	Impact	PRV - Prevention , PE&A - Public Education & Awareness , NRP - Natural Resource Protection	Solano County Water Agency	The N. Bay Aqueduct which is part of the State Water Project is already seeing a dramatic decrease in water supply reliability impacting 400,000 residents in Solano County and 27-million Californians.	ma-DR-SW-230, ma-DR-SW-234



Problem No.	Hazard Type	Area of Concern	Mitigation Alternatives	Primary Agency	Problem Description	Related MA
ps-EW-SW-225	Extreme Weather	Victim	PRV - Prevention , PPRO - Property Protection , NRP - Natural Resource Protection , SP - Structural Projects	Solano County Water Agency	In 2008 a total of 7.5-inches of rain fell in 24-hrs in the Allendale Area representing a >500-yr event. This caused extensive flooding in an area of repetitive flood losses. This has also caused flooding and operational impacts to the Solano Project.	ma-FL-SW-232
ps-FL-SW-226	Flood	Impact	PRV - Prevention , PPRO - Property Protection , PE&A - Public Education & Awareness , NRP - Natural Resource Protection	Solano County Water Agency	Countywide, both urban and rural residential areas are greatly impacted by flooding. Actual flood locations are greater than what is shown by the FEMA 100-yr flood maps.	ma-FL-SW-232
ps-FL-SW-227	Flood	Impact	PRV - Prevention , PPRO - Property Protection , PE&A - Public Education & Awareness	Solano County Water Agency	Most creeks in Solano County, especially adjacent to or outside of urban areas, are privately-owned, overgrown, and not-maintained, representing a significant flood hazard (E.g., Upper Ulatis, Upper Alamo, Suisun, Ledge wood)	ma-FL-SW-232
ps-WF-SW-229	Wildfire	Impact	PRV - Prevention , PPRO - Property Protection , NRP - Natural Resource Protection	Solano County Water Agency	Lake Berryessa is owned by USBR in Napa County but is one of the primary water supplies for 400,000 residents and agricultural users in Solano County. The Berryessa watershed has been impacted by numerous wildfires, with the 2020 LNU Wildfire being the most significant.	ma-WF-SW-217, ma-WF-SW-238

8.4.4 Mitigation Action Support Tool (MAST)

As a living document, hazard problem statements and mitigation activities will be updated through a web interface application developed specifically for participating jurisdictions. The Mitigation Action Support Tool (MAST) is accessible through mitigatehazards.com/SolanoHMP/.

MAST is a web-based interactive tool that enables multiple users to search, view, enter, and update mitigation actions, ideas or projects, and other information. MAST provides participating jurisdictions and plan reviewers (Cal OES/FEMA) access to valuable mitigation information that can be leveraged by future planning or other risk reduction efforts within the County. Participating jurisdictions can update the status of their mitigation projects throughout the planning lifecycle, and this web-based tool will improve participating jurisdiction’s ability to apply for FEMA’s Hazard Mitigation Assistance (HMA) grant programs including initial grant application processes through Cal OES.



8.5 Mitigation Strategy

The mitigation strategy is the guidebook to future hazard mitigation administration, capturing the key outcomes of the MJHMP planning process. The mitigation strategy is intended to reduce vulnerabilities outlined in the previous section (a.k.a. problem statements) with a prescription of policies and physical projects. These mitigation actions should be compatible with existing planning mechanisms and should outline specific roles and resources for implementation success.

8.5.1 Capabilities & Adaptive Capacity Assessment

This section examines the planning and regulatory, administrative, technical, financial, educational, and outreach capabilities to augment known issues and weaknesses from identified natural hazards.

Capabilities assessments in this Volume 1 and in Volume 2 include considerations of a community's adaptive capacity for climate change, as outlined in Cal OES' 2020 California Adaptation Planning Guide. Adaptive capacity is a community or region's existing ability to moderate climate change impacts. Assessing adaptive capacity includes analysis of policies, plans, programs, funding, and staffing capacity.

The tables in this section explore various local planning mechanisms, administrative capacity, financial capabilities, and education and outreach initiatives. The columns in each table represent deeper dives into the following questions:

- Is the existing planning or regulatory mechanism used currently? (Column 1, Status)
- Has the HMP been integrated into the planning mechanism currently so that the named mechanism is currently used in HMP planning? (Column 2, Current Mitigation Use)
- Is there a future opportunity to expand, improve upon, and incorporate this 2020 HMP Update into the planning or regulatory mechanism? (Column 3, Future Opportunity)

The capabilities assessment is easily-digestible and based on color coding to indicate which policies and plans are adequate, need improvement or in which the HMP could be integrated. Each table includes a legend that explain how each one of these questions are being answered according to the color indicated: green, yellow, and orange.

For more information on the regulatory environment surrounding each hazard, see hazard-specific sections of Volume 1. Volume 1, Section 5.3.5 includes an extensive list of federal and state funding opportunities as well.



8.5.1.1 Planning and Regulatory Capabilities

Table 8-10: Planning and Regulatory Capabilities

CAPABILITY ASSESSMENT LEGEND		
Status	Current Mitigation Use	Future Opportunity
Currently in use or present.	Used widely for mitigation.	Opportunity to expand and integrate.
(Sort of) Seldomly used or limited presence.	Limited use in mitigation planning.	Limited opportunity to expand and integrate.
(No) Not present or available.	Not used in mitigation planning.	No opportunity to expand or integrate.

Resource	HMP Integration			Notes / Additional Detail
	Status	Current Mitigation Use	Future Opportunity	
Planning and Regulatory Capabilities				
Hazard Reduction Programs (Annually Conducted)				
Capital Improvements Program (CIP) or Plan				HMP includes a mitigation to strengthen hazard mitigation nexus with Asset Management Plan.
Erosion/Sediment Control Program				Actively pursuing erosion/ sediment control in Putah Creek Watershed, no overall program.
Hazard-Related Public Outreach Program				
Seismic Safety Program (Non-structural Inspections)				
Hazard Plans				
Community Wildfire Protection Plan (CWPP)	N/A	N/A	N/A	Agency will help support other local efforts to develop CWPPs.
Wildfire Vulnerability Assessment				Vulnerability Assessment completed following the 2020 LNU Lightning Complex wildfire, no overall plan.
Urban or Integrated Regional Water Management Plan				2015 SCWA Urban Water Management Plan
Floodplain Management Plan				1998 SCWA Flood Control Master Plan
Stormwater Management Plan				2017 SCWA Stormwater Pollution Prevention Plan
Ground Water Management Plan(s)				Solano Subbasin Groundwater Sustainability Plan
Emergency Operations Plan				2017 Solano County Emergency Operations Plan
Climate Action Plan, Vulnerability Ass'mt, or Adaptation Plan				2011 County of Solano Climate Action Plan
Local Delta/ Wetlands Program(s)				Suisun Marsh Local Protection Program; White Slough Specific Plan



8.5.1.2 Administrative and Technical Capabilities

Table 8-11: Administrative and Technical Capabilities

CAPABILITY ASSESSMENT LEGEND		
Status	Current Mitigation Use	Future Opportunity
Currently in use or present.	Used widely for mitigation.	Opportunity to expand and integrate.
(Sort of) Seldomly used or limited presence.	Limited use in mitigation planning.	Limited opportunity to expand and integrate.
(No) Not present or available.	Not used in mitigation planning.	No opportunity to expand or integrate.

Resource	HMP Integration			Notes / Additional Detail
	Status	Current Mitigation Use	Future Opportunity	
Administrative and Technical				
Community Planning and Development Services				
Community Planner	N/A	N/A	N/A	Not a land use permitting agency
Civil Engineer				
Building Code Official	N/A	N/A	N/A	Not a land use permitting agency
Floodplain Administrator	N/A	N/A	N/A	Not the floodplain administrator; do provide engineering and flood project support and management
Fire Marshall	N/A	N/A	N/A	
Dedicated Public Outreach Personnel				Public outreach conducted for flooding (assistance addressing repetitive loss) and water conservation; strong program in existence
GIS Specialist and Capability				
Emergency Manager				Risk Manager; coordinates with County so no need for emergency manager
Grant Manager, Writer, or Specialist				Finance Director
Warning Systems/Services				
General	N/A	N/A	N/A	County maintains Alert Solano



8.5.1.3 Financial Capabilities

Table 8-12: Financial Capabilities

CAPABILITY ASSESSMENT LEGEND		
Status	Current Mitigation Use	Future Opportunity
Currently in use or present.	Used widely for mitigation.	Opportunity to expand and integrate.
(Sort of) Seldomly used or limited presence.	Limited use in mitigation planning.	Limited opportunity to expand and integrate.
(No) Not present or available.	Not used in mitigation planning.	No opportunity to expand or integrate.

Resource	HMP Integration			Notes / Additional Detail
	Status	Current Mitigation Use	Future Opportunity	
Fiscal Capabilities				
Financial Resources for Hazard Mitigation				
Levy for Specific Purposes with Voter Approval	N/A	N/A	N/A	Property tax funded; not specifically levied.
Utilities Fees	N/A	N/A	N/A	
Benefit assessments	N/A	N/A	N/A	
System Development Fee				
Various Bonds to Incur Debt				
Withheld Spending in Hazard-Prone Areas	N/A	N/A	N/A	
Stormwater Service Fees	N/A	N/A	N/A	
Capital Improvement Project Funding				



8.5.1.4 Education and Outreach

Table 8-13: Education and Outreach Capabilities

CAPABILITY ASSESSMENT LEGEND		
Status	Current Mitigation Use	Future Opportunity
Currently in use or present.	Used widely for mitigation.	Opportunity to expand and integrate.
(Sort of) Seldomly used or limited presence.	Limited use in mitigation planning.	Limited opportunity to expand and integrate.
(No) Not present or available.	Not used in mitigation planning.	No opportunity to expand or integrate.

Resource	HMP Integration			Notes / Additional Detail
	Status	Current Mitigation Use	Future Opportunity	
Education / Outreach Capabilities				
Education/Outreach Resources				
Website Dedicated to Hazard Topics				Flood control; water conservation
Dedicated Social Media				Agency FB page used often for drought, water conservation, and other hazard-related information. Can always improve, but strong program
Hazard Info. Avail. at Library/ Planning Desk	N/A	N/A	N/A	
Annual Public Safety Events				Not many public events in the last 1.5 years due to COVID, but Agency has historically participated in some public events
Ability to Field Public Tech. Assistance Requests				
Public Safety Newsletters or Printed Outreach				
Fire Safe Councils	N/A	N/A	N/A	Agency may consider supporting the development of Fire Safe Councils, but would not develop themselves.
Resource Conservation Districts				Solano Resource Conservation District
Other				



8.5.2 Mitigation Actions

Mitigation actions were developed based upon the jurisdiction’s priorities, risk assessment results, and mitigation alternatives. The mitigation action prioritization method used by all participating jurisdictions is described in Section 5.5.1 of Volume 1. Table 8-14 lists each priority mitigation action, responsible party, time frame, potential funding source, implementation steps, and resources need to implement based upon the Planning Committee consensus.

Each participating jurisdiction, including the Solano County Water Agency, considered ongoing relevancy of mitigation actions from the existing MJHMP and retained or removed such actions while adding new relevant actions as well. Mitigation actions were examined for relevancy and the potential for future implementation and then evaluated for potential follow-up. Some mitigation actions developed during the previous HMP effort were not included because they were an inherent part of the HMP update process or were not detailed enough for implementation at a local Jurisdiction level. the Solano County Water Agency has made significant changes to other mitigation actions because of the updated risk assessment and implementation strategy, to include more detail, or to update based on current mitigation practices. Volume 1, Section 5.5.2 provides a record of County wide mitigation actions, the status, and additional notes for each action.

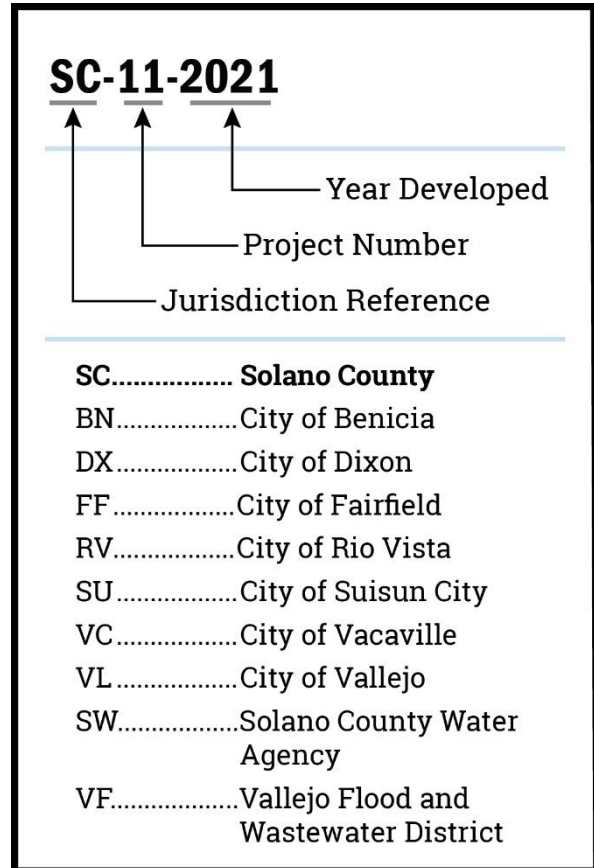


Figure 8-18: Mitigation Action Key

Table 8-14 lists each mitigation action for the Solano County Water Agency. Each participating jurisdiction developed unique mitigation actions, targeted at their own unique priorities and vulnerabilities. Each mitigation action identifies the responsible party, time frame, potential funding source, implementation steps and resources needed to implement these priority mitigation actions. As a living document, hazard problem statements and mitigation activities will be updated through MAST. The detail in Table 8-14 meets the regulatory requirements of FEMA and DMA 2000.

Table 8-14: Solano County Water Agency Mitigation Actions

Mitigation No.	Hazard Type	Mitigation Type	Status	Year	Primary Agency	Title/Description	Responsible Party	Estimated Cost	Estimated Benefit	Time Frame	HMA Activity Type	Potential Grant Source	Priority	Goal	Related Problem Statements
ma-AH-SW-228	All Hazard	ES - Emergency Services	Pending	2021	Solano County Water Agency	Construct backup generators at critical facilities to respond to hazard events during loss of power.	Engineering	High - Existing funding will not cover the cost of the project; implementation would require new revenue through an alternative source (for example, bonds, grants, and fee increases).	High - Project will provide an immediate reduction of risk exposure for life and property.	1-3 Years	5%	HMGP / BRIC , Internal Funding	High	Goal 2: Infrastructure , Goal 4: Resilience	ps-AH-SW-203, ps-WF-SW-206
ma-AH-SW-229	All Hazard	ES - Emergency Services	Pending	2021	Solano County Water Agency	Evaluate public safety communications infrastructure including radio communications for needed upgrades to maintain communication with Monticello Dam.	Engineering	Medium - The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.	High - Project will provide an immediate reduction of risk exposure for life and property.	1-3 Years	N/A	CDBG DRI , EMPG , Internal Funding	High	Goal 4: Resilience	ps-AH-SW-204
ma-DR-SW-230	Drought/ Climate Change	PRV - Prevention , SP - Structural Projects	Pending	2021	Solano County Water Agency	Assess options for additional redundancy in SCWA water system, including additional interties between two systems	Engineering	High - Existing funding will not cover the cost of the project; implementation would require new revenue through an alternative source (for example, bonds, grants, and fee increases).	High - Project will provide an immediate reduction of risk exposure for life and property.	3-5 Years	Planning	HMGP / BRIC	High	Goal 1: People , Goal 2: Infrastructure , Goal 4: Resilience	ps-DR-SW-209, ps-CC-SW-221, ps-DR-SW-224
ma-DR-SW-234	Drought/ Climate Change	PE&A - Public Education & Awareness	Ongoing	2021	Solano County Water Agency	Continue public education and outreach to encourage water conservation, especially during drought.	Admin. Services	Medium - The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.	High - Project will provide an immediate reduction of risk exposure for life and property.	Ongoing	5%	HMGP / BRIC , Internal Funding	Medium	Goal 1: People , Goal 4: Resilience	ps-CC-SW-221, ps-DR-SW-224
ma-EQ-SW-235	Earthquake	PPRO - Property Protection	Ongoing	2021	Solano County Water Agency	Conduct internal assessment of Agency actions to ensure adequate earthquake mitigation in South Putah Canal and work with Bureau of Reclamation on projects within its jurisdiction.	Admin; Engineering	Low - The project could be funded under the existing budget. The project is part of or can be part of an ongoing existing program.	Medium - Project will have a long-term impact on the reduction of risk exposure for life and property, or project will not provide an immediate reduction in the risk exposure for property.	1-3 Years	N/A	Internal Funding	Medium	Goal 2: Infrastructure , Goal 4: Resilience	ps-EQ-SW-222
ma-EQ-SW-237	Earthquake	PPRO - Property Protection	Pending	2021	Solano County Water Agency	Continue coordination with state and federal agencies to protect N. Bay Aqueduct and Solano Project assets from failures from earthquakes	Engineering	Medium - The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.	Medium - Project will have a long-term impact on the reduction of risk exposure for life and property, or project will not provide an immediate reduction in the risk exposure for property.	3-5 Years	Planning	HMGP / BRIC	Medium	Goal 2: Infrastructure , Goal 4: Resilience	ps-EQ-SW-223

Mitigation No.	Hazard Type	Mitigation Type	Status	Year	Primary Agency	Title/Description	Responsible Party	Estimated Cost	Estimated Benefit	Time Frame	HMA Activity Type	Potential Grant Source	Priority	Goal	Related Problem Statements
ma-EW-SW-231	Extreme Weather	PPRO - Property Protection	Pending	2021	Solano County Water Agency	Develop package of erosion control projects and coordinate with Army Corps to develop single 404 dredge and fill permit for series.	LPCCC	High - Existing funding will not cover the cost of the project; implementation would require new revenue through an alternative source (for example, bonds, grants, and fee increases).	High - Project will provide an immediate reduction of risk exposure for life and property.	1-3 Years	N/A	Internal Funding	Extreme	Goal 2: Infrastructure , Goal 3: Environment , Goal 4: Resilience	ps-EW-SW-218, ps-EW-SW-219
ma-FL-SW-216	Flood/Slope Failure	NRP - Natural Resource Protection	Pending	2021	Solano County Water Agency	Pursue projects to slow localized floodwaters, erosion, and sediment in Putah Creek Watershed, including through rock vanes, riparian habitat and wetland restoration, or other methods.	Water Resources Engineering; Streamkeeper	High - Existing funding will not cover the cost of the project; implementation would require new revenue through an alternative source (for example, bonds, grants, and fee increases).	High - Project will provide an immediate reduction of risk exposure for life and property.	5-10 Years	Project	HMGP / BRIC	Extreme	Goal 2: Infrastructure , Goal 3: Environment , Goal 4: Resilience	ps-CC-SW-220, ps-DR-SW-210, ps-EW-SW-214, ps-EW-SW-215, ps-EW-SW-216, ps-EW-SW-219, ps-FL-SW-211, ps-SF-SW-207, ps-SF-SW-217
ma-FL-SW-232	Flood	PPRO - Property Protection	Ongoing	2021	Solano County Water Agency	Continue to work with the County to address repetitive loss properties in unincorporated County, through such efforts as the previously-active home raising program.	Admin, Engineering	High - Existing funding will not cover the cost of the project; implementation would require new revenue through an alternative source (for example, bonds, grants, and fee increases).	High - Project will provide an immediate reduction of risk exposure for life and property.	3-5 Years	Project	HMGP / BRIC , FMA	High	Goal 1: People , Goal 4: Resilience	ps-FL-SW-212, ps-EW-SW-225, ps-FL-SW-226, ps-FL-SW-227
ma-FL-SW-233	Flood	SP - Structural Projects	Ongoing	2021	Solano County Water Agency	Continue to support flood protection efforts for the City of Rio Vista, including through ongoing maintenance of the Mellon Levee	Engineering	High - Existing funding will not cover the cost of the project; implementation would require new revenue through an alternative source (for example, bonds, grants, and fee increases).	High - Project will provide an immediate reduction of risk exposure for life and property.	Ongoing	N/A	Internal Funding , Other grant sources	Medium	Goal 1: People , Goal 2: Infrastructure , Goal 3: Environment , Goal 4: Resilience	ps-FL-SW-213
ma-FL-SW-236	Flood	SP - Structural Projects	Pending	2021	Solano County Water Agency	Replace the Pleasant Creek culvert under Putah Creek Road	Engineering	High - Existing funding will not cover the cost of the project; implementation would require new revenue through an alternative source (for example, bonds, grants, and fee increases).	High - Project will provide an immediate reduction of risk exposure for life and property.	3-5 Years	Project	HMGP / BRIC	High	Goal 2: Infrastructure	ps-EW-SW-219, ps-EW-SW-218, ps-EW-SW-216, ps-EW-SW-214
ma-WF-SW-217	Wildfire	PPRO - Property Protection	Pending	2021	Solano County Water Agency	Coordinate with Solano County to develop a county-wide chipping program that would quickly chip downed timber and apply woody material to slopes to prevent erosion (see County MA-WF-SC-38)	DRM with support from local fire districts, SCWA, other agencies	High - Existing funding will not cover the cost of the project; implementation would require new revenue through an alternative source (for example, bonds, grants, and fee increases).	High - Project will provide an immediate reduction of risk exposure for life and property.	3-5 Years	Project	HMGP / BRIC	High	Goal 2: Infrastructure , Goal 3: Environment , Goal 4: Resilience	ps-WF-SW-205, ps-WF-SW-229
ma-WF-SW-238	Wildfire	PRV - Prevention , PPRO - Property Protection , NRP	Ongoing	2021	Solano County Water Agency	Coordinate with state, federal, and local agencies, and partners on watershed health projects in Berryessa watershed.	Environmental Services	Medium - The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.	High - Project will provide an immediate reduction of risk exposure for life and property.	Ongoing	Project	HMGP / BRIC	High		ps-WF-SW-229

SECTION 9

JURISDICTIONAL ANNEX:

Solano Irrigation District

PENDING



SOLANO COUNTY

MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

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SECTION 9

JURISDICTIONAL ANNEX:

Vallejo Flood and Wastewater District



SOLANO COUNTY

MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

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Solano County

Multi-Jurisdiction Hazard Mitigation Plan

VALLEJO FLOOD AND WASTEWATER DISTRICT (VF.)

Special District Annex

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Adoption Resolution

To comply with DMA 2000, the Vallejo Flood and Wastewater District has officially adopted this Solano County Multi-Jurisdictional Hazard Mitigation Plan (MJHMP), Volume 1, and its jurisdictional annex. The adoption of the MJHMP recognizes the District's commitment to reducing the impacts of natural hazards. See included adoption resolution.

RESOLUTION NUMBER 2022 – 6050

A RESOLUTION FOR ADOPTION OF THE SOLANO MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

BE IT RESOLVED, by the Board of Trustees of the Vallejo Flood and Wastewater District of Solano County, California as follows:

WHEREAS, the District, a political subdivision of the State of California, is an official participating jurisdiction in the updated Solano Multi-Jurisdictional Hazard Mitigation Plan (MJHMP); and

WHEREAS, the District recognizes the updated MJHMP as the official hazard mitigation plan for participating jurisdictions; and

WHEREAS, Volume I of the updated MJHMP recognizes the threat that natural hazards pose to people and property Solano County-wide; and

WHEREAS, the District's Annex to Volume 1 of the updated MJHMP provides additional information specific to the District, with a focus on providing additional details on the planning process, risk assessment, and mitigation strategy for this community; and

WHEREAS, the District has reviewed Volume 1 of the updated MJHMP and its Annex and affirms that the plan actions in Volume 1 and its Annex should reduce the potential for harm to people and property from future hazard occurrences within the community; and

WHEREAS, the U.S. Congress passed the Disaster Mitigation Act of 2002 (Disaster Mitigation Act) emphasizing the need for pre-disaster mitigation of potential hazards; and

WHEREAS, The Disaster Mitigation Act made available mitigation grants to state and local governments; and;

WHEREAS, an adopted hazard mitigation plan is required as a condition of future funding for mitigation projects under multiple FEMA pre- and post-disaster mitigation grant programs; and;

WHEREAS, the District fully participated in the FEMA-prescribed mitigation planning process to prepare this updated MJHMP; and;

WHEREAS, the residents were afforded opportunities to comment and provide input in the updated MJHMP and the mitigation actions in the Plan; and;

WHEREAS, the District, as a fully participating jurisdiction of the updated MJHMP, is an eligible sub-applicant to the State of California under FEMA's hazard mitigation grant program guidance; and;

WHEREAS, The California Office of Emergency Services (Cal OES), and the FEMA Region IX officials have reviewed the updated MJHMP, and approved it contingent upon this official adoption by the participating governing body and;

WHEREAS, the District desires to comply with the requirements of the Disaster Mitigation Act and to augment its emergency planning efforts by formally adopting the updated MJHMP; and;

WHEREAS, Adoption by the governing body for the District demonstrates the jurisdiction's commitment to fulfilling the mitigation goals and objectives outlined in this updated MJHMP; and;

WHEREAS, Adoption of this plan helps to coordinate the responsible agencies to carry out their responsibilities under the updated MJHMP.

BE IT FURTHER, RESOLVED by the Board of Trustees of the Vallejo Flood and Wastewater District:

1. Adopts the updated Solano Multi-Jurisdictional Hazard Mitigation Plan Volume 1 and its Annex, as approved by FEMA and Cal OES, as the official mitigation plan for Vallejo Flood & Wastewater District.
2. Authorizes the Solano County Emergency Service Manager to submit an approved and signed copy of this adoption resolution to the California Office of Emergency Services and FEMA Region IX officials to enable the plan's final approval in accordance with the requirements of the Disaster Mitigation Act of 2000.

ADOPTED by the Board of Trustees of the Vallejo Flood and Wastewater District on the 8th day of March, 2022 by the following vote:

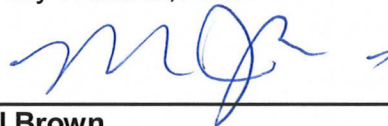
AYES: McConnell, Arriola, Brown, Dew, Loera-Diaz, Miessner, Tipton, Verder-Aliga

NOES: None

ABSENT: Hannigan

ABSTAIN: None

WITNESS my hand and the Seal of said District this 8th day of March, 2022.



MJ Brown
Clerk of the Board



Section 9. Vallejo Flood and Wastewater District

9.1 Purpose

This Annex details the hazard mitigation planning elements specific to the Vallejo Flood and Wastewater District. This Annex is not intended to be a standalone document but appends to and supplements the information contained in the umbrella plan document. As such, all sections of the umbrella plan, including the planning process and other procedural requirements apply to and were met by the Vallejo Flood and Wastewater District. This Annex provides additional information specific to the Vallejo Flood and Wastewater District, with a focus on providing additional details on the planning process, risk assessment, and mitigation strategy for this community.

Hazard Mitigation Plan Points of Contact

Primary Point of Contact

Mark Tomko, Director of Engineering
Vallejo Flood and Wastewater District
450 Ryder St,
Vallejo, CA 94590
Telephone: 707.652.7801
e-mail: MTomko@vallejowastewater.org

Alternate Point of Contact

Jennifer Harrington, Director of Enviro. Services
Vallejo Flood and Wastewater District
450 Ryder St,
Vallejo, CA 94590
Telephone: 707.652.7806
e-mail: JHarrington@vallejowastewater.org

9.2 Planning Methodology

The Vallejo Flood and Wastewater District followed the planning process detailed in Volume 1, Section 3, including participating in the County Hazard Mitigation Planning Committee (HMPC) and Steering Committee and formulating their own internal planning team to support the broader planning process. Internal planning participants, their positions, and how they participated in the planning process are shown in Table 9-1.

Table 9-1: Planning Committee Members

Planning Committee Members	Department
Mark Tomko	Director of Engineering
Jeff Tucker	Director of Finance
Jennifer Harrington	Director of Environmental Services
Johnson Ho	Director of Operations and Maintenance
Justin Keating	Director of Field Operations
Keith Sorsdal	Director of Safety and Risk Management (retired)

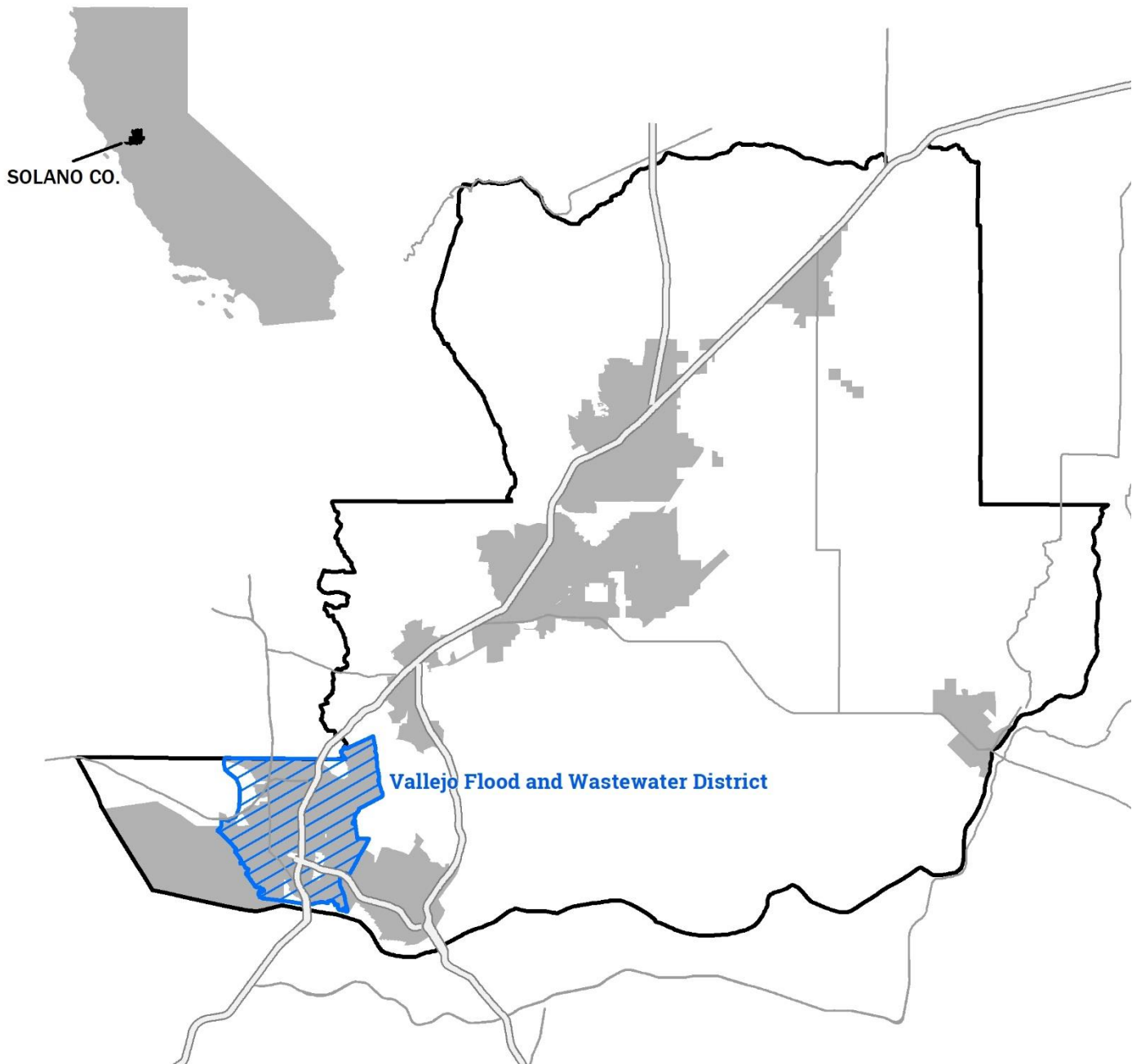


Figure 9-1: Vallejo Flood and Wastewater District Location

9.3 What's New

The Vallejo Flood and Wastewater District has been making improvements toward reducing natural hazard risks to life and property since the existing MJHMP was adopted.



The District reevaluated previous mitigation actions. Some mitigation actions have been completed and are highlighted in Table 9-3. The District determined to cancel some due to reprioritization, lack of funding, or other listed reasons. Table 9-2 lists those cancelled mitigation actions along with an explanation for why. Other mitigation actions are pending or ongoing and are included in Table 9-14.

Table 9-2: Cancelled Mitigation Actions

Mitigation No.	Hazard Type	Status	Year	Primary Agency	Title/Description	Responsible Party	Reason Cancelled
ma-AH-VF-211	All Hazard	Cancelled	2017	Vallejo Flood and Wastewater District	Ensure that the District provides leadership and coordinates with the private sector, public institutions and other public bodies in disaster mitigation	Risk Management	Overly broad; cancelled in favor of more specific 2021 mitigation actions.
ma-AH-VF-213	All Hazard	Cancelled	2017	Vallejo Flood and Wastewater District	Collaborate with local, state, regional, and federal partners to increase the security of wastewater systems.	Manager; Safety & Risk Management	While this work in ongoing, it is best addressed in other documents, specifically the District's EPA-required Risk Assessment and Emergency Response Plan
ma-EW-VF-210	Extreme Weather	Cancelled	2017	Vallejo Flood and Wastewater District	Reduce the Vallejo Community's vulnerability to severe storms and associated hazards.	All departments	Cancelled in favor of more specific next steps, including implementing the Storm Drain Master Plan (2021)

9.3.1 Mitigation Successes

Table 9-3 displays multiple important mitigation actions that have been completed by the Vallejo Flood and Wastewater District. The following describes the District's applicable success stories.

Table 9-3: Completed Mitigation Actions

Mitigation No.	Hazard Type	Status	Year	Primary Agency	Title/Description	Responsible Party
ma-AH-VF-205	All Hazard	Completed	2017	Vallejo Flood and Wastewater District	Develop Asset Management Program to determine the Risk of damage to assets in natural disasters.	Engineering; Operations
ma-CC-VF-207	Climate Change	Completed	2017	Vallejo Flood and Wastewater District	Assess the impacts of sea level rise in our Vallejo Community and on our assets	Engineering; Operations
ma-EW-VF-206	Extreme Weather	Completed	2017	Vallejo Flood and Wastewater District	Analyze the District's stormwater system to reduce local flooding caused by possible inadequate storm drainage.	Engineering, Finance

Vallejo Sea Wall Project Assessment. The District completed Phase 1 of Flood Wall Project in 2018 to protect its wastewater treatment facility from sea level rise. Phase 1 consisted of the civil engineering design of the Flood Wall. The District elected not to move forward with Phase 2 (construction), due to limited resources. The District now has a "shovel ready" project to construct in the future to continue mitigating future impacts of sea level rise.



Asset Management Plan. The District's 2017 HMP included the development of an asset management plan; the District completed such a plan since 2017. This HMP focuses on refinement of the asset management plan with a hazard mitigation lens, and the addition of a storm drain asset management plan.

Storm Drain Master Plan. This District updated its Storm Drain Master Plan in March of 2020. The update revised recommended alternative solutions for localized flooding due to updated modeling efforts that in large part reduced the projected flooding intensities for 15-year and 100-year peak runoff rates. While many of the updated solutions were downsized, the update also added new projects that resulted in an overall increase in total costs to holistically address storm drain issues. This HMP includes prioritization and coordination efforts to implement these recommended solutions.

District Engineering Standards. New major development in the City of Vallejo is subject to current VFWD engineering design standards and policies. The District updated its Engineering Standards in July, 2020. The updates require drainage studies to evaluate sea level rise impacts and implement potential solutions to protect the proposed development from sea level rise.

The District continues to integrate the latest sea level rise, flood, and tidal event data when updating its facilities, such as a recent update design for the Mariners Cove pump station.

9.4 Risk Assessment

The intent of this section is to profile the Vallejo Flood and Wastewater District's hazards and assess the District's vulnerabilities, distinct from that of the County wide planning area. The hazard profiles in Volume 1 discuss overall impacts to the planning area and describes the hazard problem description, hazard extent, magnitude/severity, previous occurrences of hazard events and the likelihood of future occurrences. For more information on Risk Assessment Methodologies, see Vol. 1 and Appendix A.

9.4.1 Hazard Screening Criteria

Planning Team members from each represented department collectively discussed which hazards should be profiled in the Plan and which should not. The results of that discussion can be found in Table 9-4. Detailed hazard profiles of the most significant County-wide hazards are described in Section 4 of Volume 1. The Planning Team reviewed previously-prepared hazard mitigation plans and other relevant documents to determine the realm of natural hazards that have the potential to affect the Vallejo Flood and Wastewater District. Table 9-5 provides a crosswalk of hazards identified in Vol. 1 of this plan, the Vallejo Flood and Wastewater District General Plan, and 2018 California State Hazard Mitigation Plan. The crosswalk was used to develop a preliminary hazards list, providing a framework for the Planning Team members to evaluate which hazards were truly relevant to the Vallejo Flood and Wastewater District and which ones were not. Section 9.4.2 below describes the hazard risk ranking process that was performed by the planning team which prioritized hazards that are specifically relevant to the Vallejo Flood and Wastewater District.



Table 9-4: County-Wide Hazard Prioritization

Hazard Type	Explanation
Climate Change	High priority county-wide, profiled hazard.
Dam/ Levee failure	Dam failure is possible in Solano County but is best addressed in other plans, specifically Emergency Action Plans for high hazard dams affecting Solano County.
Drought	High priority county-wide, profiled hazard.
Earthquake/ Geologic Hazards	High priority county-wide, profiled hazard.
Flood	High priority county-wide, profiled hazard.
Hazardous Material	While hazardous materials can release and impact the County, there are better avenues to address this hazard outside this plan.
High Winds/ Straight Line Winds	High priority county-wide, profiled as part of Extreme Weather.
Insect Hazards	While hazardous insects exist in Solano County, this was not considered a priority and is not profiled in this plan.
Pandemic Disease	While pandemic disease can impact the County, there are better avenues to address this hazard outside this plan.
Extreme Weather, including:	High priority county-wide for high wind, heavy rain, and high heat.
Extreme Heat	Profiled as part of Extreme Weather.
Hail	Hail events are rare and not considered a priority.
High Wind	Profiled as part of Extreme Weather.
Heavy Rain	Profiled as part of Extreme Weather.
Fog	Fog events are rare and are not considered a priority.
Lightning	Not a priority as an extreme weather event; discussed as source of wildfire.
Severe Thunderstorm	Severe thunderstorms were not identified as a priority in this plan.
Winter Storm / Extreme Cold/ Freeze Events	Winter storms are rare in Solano County and not identified as a priority for this plan.
Slope Failure	High priority county-wide, profiled hazard.
Soil Hazards	While limited soil hazards exist in Solano County (erosion and shifting soils), these are not prioritized in this plan. Erosion discussed under flood hazard.
Terrorism/Human Caused Threats	While terrorism is certainly a threat to the County and participating jurisdictions, it is best addressed in other plans as this HMP does not address human-caused threats.
Tornado	Impacts to the County from tornados are extremely unlikely, if any.
Volcanic Activity	Due to distance from volcanoes and the limited chance of an eruption, this hazard was not identified as a priority.
Wildfire	High priority county-wide, profiled hazard.

Table 9-5: Document Review Crosswalk



Hazards	2014 Vallejo General Plan	2014 Solano County HMP	2018 California State HMP
Agricultural Pests			■
Climate Change	■	■	■
Dam Failure	■	■	■
Drought	■	■	■
Earthquake	■	■	■
Extreme Weather		■	■
Flood	■	■	■
Landslide	■	■	■
Levee Failure	■		■
Manmade Hazards	■		■
Pandemic Disease			■
Sea Level Rise	■	■	■
Soil Hazards	■		■
Terrorism & Tech Hazards			■
Tsunami			■
Volcano			■
Wildfire	■	■	■

9.4.2 Hazard Risk Ranking

The Vallejo Flood and Wastewater District’s Planning Team used the same hazard prioritization process as the Solano County Hazard Mitigation Planning Committee. This process is described in detail in Section 4.3.1 of Vol. 1. Figure 9-2 displays the results of the hazard risk ranking exercise that was performed by the Planning Team. The Planning Team chose to assess the Vallejo Flood and Wastewater District’s vulnerability to the following hazards:

- Flood
- Earthquake
- Extreme Weather (heavy rain)
- Slope Failure
- Climate Change (sea-level rise)

All of these hazards have been profiled in Vol. 1 of this document. The purpose of this annex is to specifically address the Vallejo Flood and Wastewater District’s vulnerability to these specifically-identified hazards.



9.4.3 Vulnerability Assessment

Assessing vulnerabilities exposes the unique characteristics of individual hazards and begins the process of narrowing down which areas within the Vallejo Flood and Wastewater District are vulnerable to specific hazard events. The vulnerability assessment considered unique local knowledge of hazards and impacts and a GIS overlaying method for examining such vulnerabilities more in depth. Using these methods, participating jurisdictions estimated vulnerable populations, infrastructure, and potential losses from hazards.

9.4.3.1 Risk Assessment

Each participating jurisdiction developed a risk matrix that assessed the probability and impact of various hazards within the jurisdiction. Figure 9-2 is the jurisdiction's risk assessment, which was completed in part using the web based and interactive Risk Assessment Mapping Platform (RAMP), accessed via the project website at www.mitigatehazards.com. RAMP allows interactive discovery of robust risk, vulnerability, and exposure data developed especially for Solano County. RAMP is a mapping platform built specifically for mitigation planning. It displays County/jurisdiction facilities and buildings overlaid with natural hazards layers to bring interactivity and individual discovery to the GIS analysis performed for the MJHMP. See Vol. 1 for a detailed description of RAMP. The Planning Team used RAMP in meetings and as needed to understand vulnerabilities to the Vallejo Flood and Wastewater District. Users interactively filter facilities and buildings by natural hazard zones and/or construction characteristics.

9.4.3.2 Snapshot Exposure Maps

The included snapshot maps illustrate the Vallejo Flood and Wastewater District's vulnerability to specific hazards. Figures include:

- Figure 9-3: Vallejo Flood and Wastewater District - FEMA Flood Risk Exposure
- Table 9-6: VFWD Damage Estimate Summaries, 100-YR Flood
- Figure 9-4: Vallejo Flood and Wastewater District - Concord-Green Valley EQ Scenario M6.8
- Figure 9-5: Vallejo Flood and Wastewater District - Hayward-Rodger's Creek EQ Scenario (M7.1)
- Figure 9-6: Vallejo Flood and Wastewater District - Snapshot Layout - Areas with Potential for Liquefaction
- Figure 9-7: Vallejo Flood and Wastewater District - Average Annual Precipitation (1981-2010)
- Figure 9-8: Vallejo Flood and Wastewater District - Snapshot Layout - Landslide Risk Exposure
- Figure 9-9: VWFD - RCP Comparison
- Figure 9-10: Vallejo Flood and Wastewater District - Sea Level Rise Exposure
- Table 9-6: VFWD Damage Estimate Summaries, 100-YR Flood
- Table 9-7: VFWD Damage Estimate Summary, Concord Green Valley M6.8 Earthquake
- Table 9-8: VFWD Damage Estimate Summary, Hayward Rodger's Creek M7.1 Earthquake

Based on the above risk assessment, the snapshot maps focus on those hazards prioritized by the jurisdiction. These maps helped the Planning Team understand the exposure of population, parcels, and critical infrastructure to specific hazards. Each map contains an exposure summary that displays the percent of the population, the improvement and content value of parcels, and the amount of critical infrastructure that is exposed to each respective hazard.



Risk Assessment Matrix Definitions

PROBABILITY RATING

The likelihood of a hazard event occurring within a time period?

PROBABILITY	Highly Likely	Highly likely - 100% annual probability. Or likely to occur every year in your lifetime.
	Likely	Likely - Between 10 and 100% annual probability. Or will occur several times in your lifetime.
	Possible	Possible - Between 1 and 10% annual probability. Or likely to occur some time in your lifetime.
	Unlikely	Unlikely - Less than 1% annual probability. Or unlikely but possible to occur in your lifetime.

IMPACT RATING

In terms of injuries, damage, or death, would you anticipate impacts to be minor, limited, critical, or catastrophic when a significant hazard event occurs? The impact could be in terms of one hazard event (flooding from a culvert failure) or a large-scale event (multiple rivers flooding) in the same jurisdictional boundary.

IMPACT			
Minor	Limited	Critical	Catastrophic
Minor - Very few injuries, if any. Only minor property damage and minimal disruption on quality of life. Temporary shutdown of critical facilities.	Limited - Minor injuries only. Approx. 10% or less of property in disaster footprint damaged or destroyed. Complete shutdown of critical facilities for more than one day.	Critical - Multiple deaths/injuries possible. Between 25% and 50% of property in disaster footprint is damaged or destroyed. Complete shutdown of critical facilities for more than one week.	Catastrophic - High number of deaths/injuries possible. More than 50% of property in affected area damaged or destroyed. Complete shutdown of critical facilities for 30 days or more.

To concentrate resources on highest priority hazards, the jurisdictional planning team will focus on "High" and "Extreme" risk hazards in this annex. These hazards have higher probability and greater impact as it relates to the jurisdiction's planning area.

Hazard definitions are included in Vol. 1 of this plan.

Hazard Information / Legend:



Climate Change is prioritized for all jurisdictions.

Sea-Level Rise is a subhazard of climate change for some jurisdictions (County, Vallejo, Benicia, Suisun City, Fairfield).



Extreme Weather in Solano County includes high heat, high wind, and heavy rain.



If a hazard symbol is grey, the planning team did not develop hazard vulnerability information due to lower perceived probability and impact.

VFWD Risk Matrix

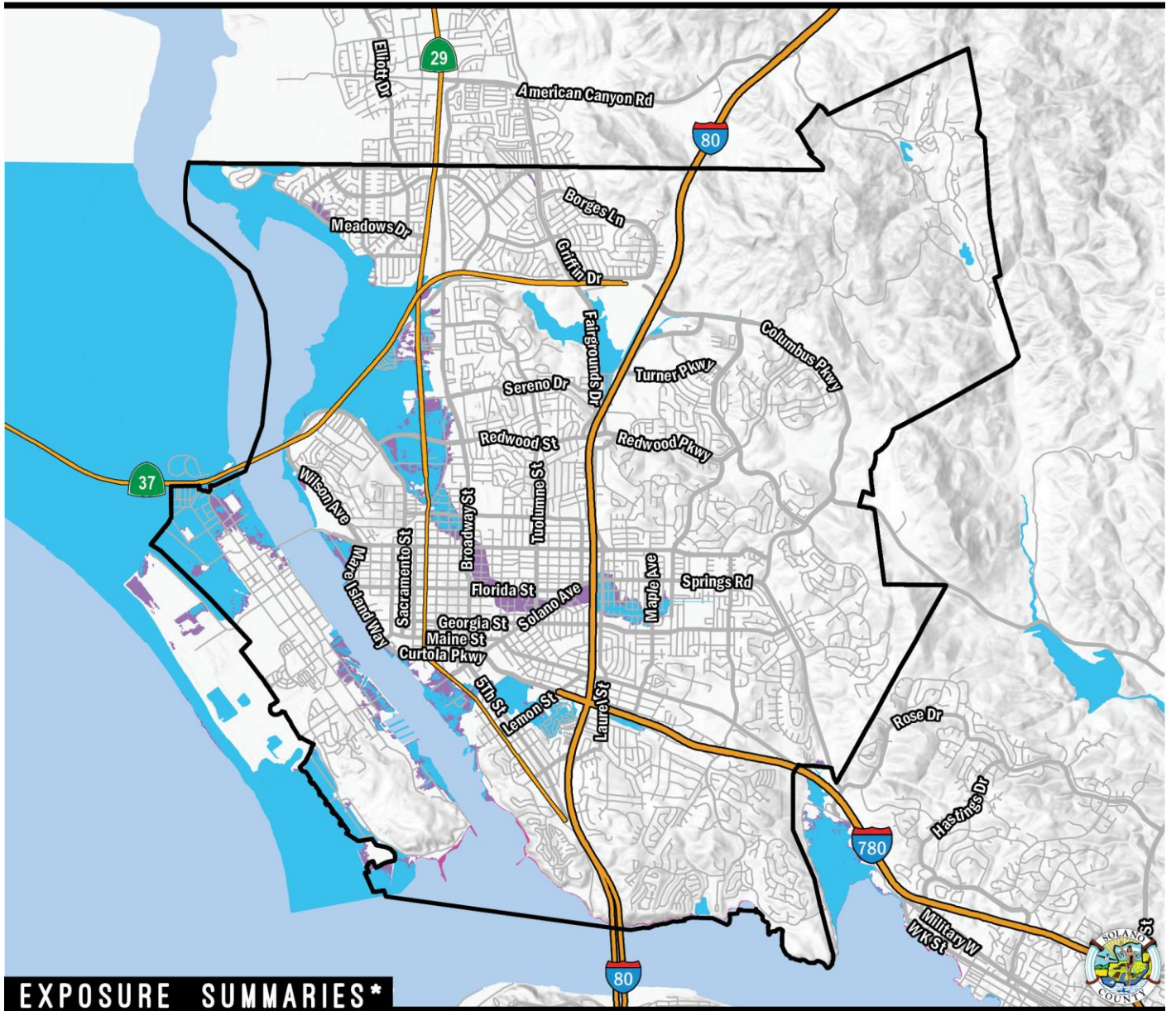
		IMPACT			
		Minor	Limited	Critical	Catastrophic
PROBABILITY	Highly Likely	Medium DROUGHT WILDFIRE	High SLOPE FAILURE	Extreme EXTREME WEATHER	Extreme
	Likely			High	FLOOD
	Possible	Low	Medium	High EARTHQUAKE	High
	Unlikely	Low	Low	Medium	Medium

Figure 9-2: Vallejo Flood and Wastewater District Risk Assessment



FEMA FLOOD RISK EXPOSURE

VALLEJO FLOOD AND WASTEWATER DISTRICT



EXPOSURE SUMMARIES*

POPULATION COUNT IN HAZARD AREA		PARCEL COUNT IN HAZARD AREA		PARCEL VALUE IN HAZARD AREA		CRITICAL INFRASTRUCTURE COUNTS IN HAZARD AREA			
Count	Exp. Rate**	Count	Exp. Rate**	Sum of Improvement Value	Exp. Rate**	Infrastructure Category	Count	Exp. Rate**	Count/Sum Includes:
9,880	8%	1,251	3%	\$1,009,121,229	6%	Essential Facilities	0	0%	100 + 500
Count Includes: 100 + 500		Count Includes: 100 + 500		Sum of Content Value		High Potential Loss	1,823	10%	Sum of Transportation & Lifeline Linear Mileage
				\$840,496,871	8%	Transportation & Lifeline	0	0%	63 11%
				Count Includes: 100 + 500					

MAP LEGEND

100-YR	LEVEE
100-YR COASTAL	
500-YR	

*Exposure summaries include 100-year and 500-year flood zone areas, including coastal and leveed areas. Hazard data source: FEMA.

**Exposure Rate - Exposed summary or count as a percentage of total summary or count within jurisdiction.

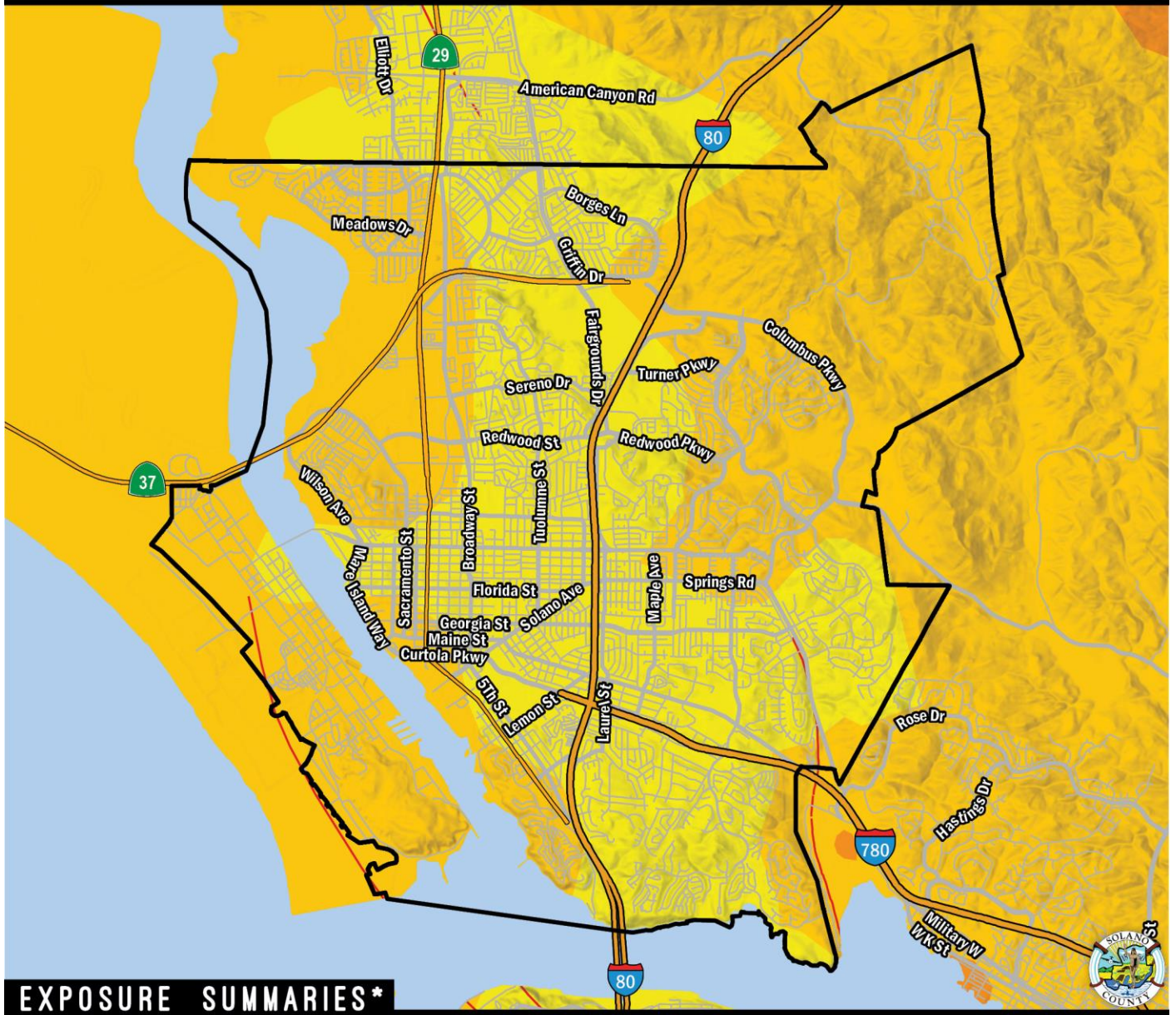
Dynamic Planning + Science
for Solano County, 2021

Figure 9-3: Vallejo Flood and Wastewater District - FEMA Flood Risk Exposure



CONCORD-GREEN VALLEY EQ SCENARIO (M6.8)

VALLEJO FLOOD AND WASTEWATER DISTRICT



EXPOSURE SUMMARIES*

POPULATION COUNT IN HAZARD AREA		PARCEL COUNT IN HAZARD AREA		PARCEL VALUE IN HAZARD AREA		CRITICAL INFRASTRUCTURE COUNTS IN HAZARD AREA			
Count	Exp. Rate**	Count	Exp. Rate**	Sum of Improvement Value	Exp. Rate**	Infrastructure Category	Count	Exp. Rate**	Count/Sum Includes:
120,992	100%	36,470	100%	\$16,941,129,441	100%	Essential Facilities	0	0%	S+++E
Count Includes:	S+++E	Count Includes:	S+++E	Sum of Content Value	Exp. Rate**	High Potential Loss	19,054	100%	Sum of Transportation & Lifeline Linear Mileage
				\$9,975,727,938	100%	Transportation & Lifeline	0	0%	591
				Count Includes:	S+++E				100%



*Exposure summaries include strong, very strong, violent, and severe MMI classes. Hazard data source: USGS.
 **Exposure Rate - Exposed summary or count as a percentage of total summary or count within jurisdiction.

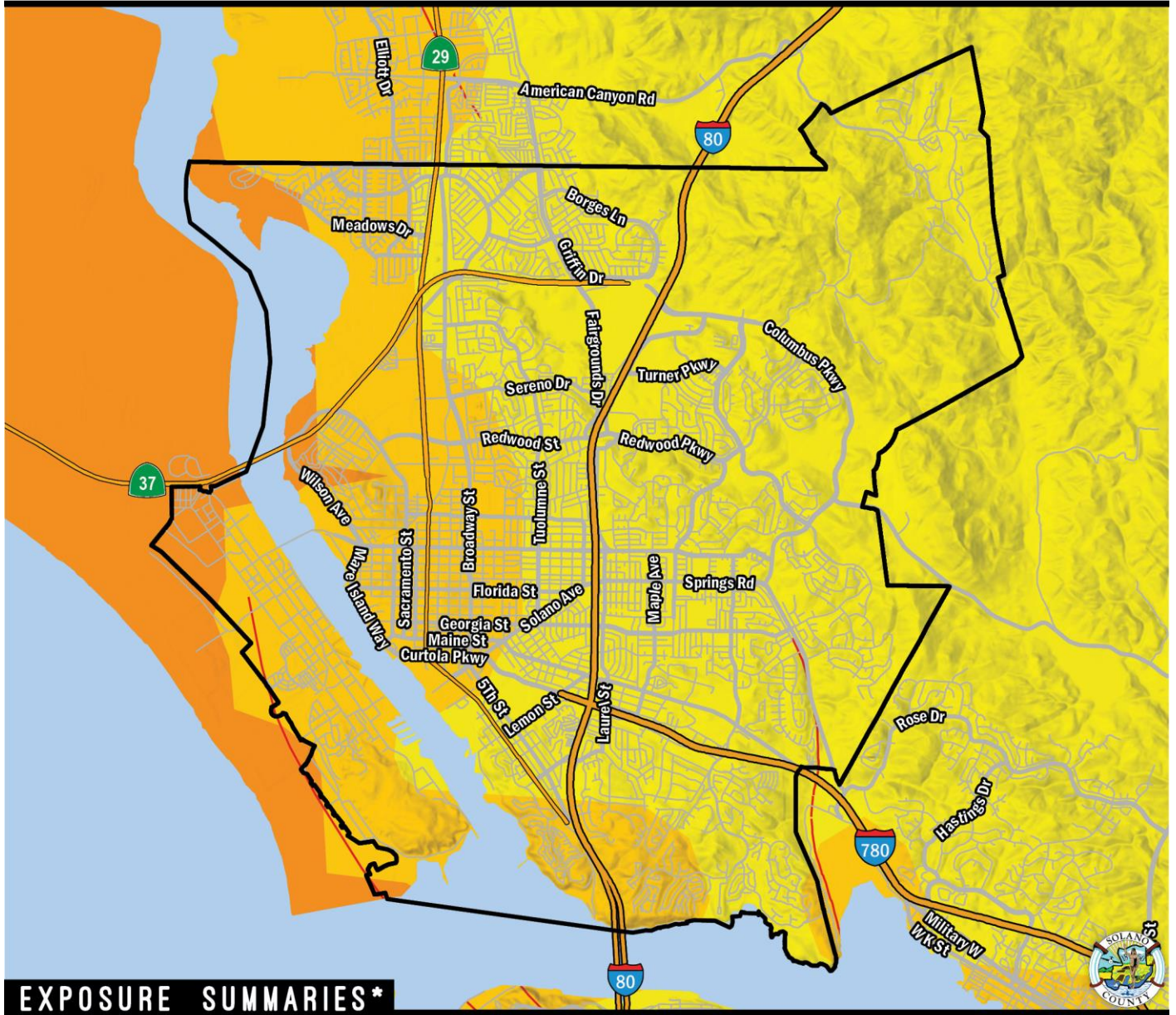
Dynamic Planning + Science for Solano County, 2021

Figure 9-4: Vallejo Flood and Wastewater District - Concord-Green Valley EQ Scenario M6.8



HAYWARD-RODGER'S CREEK EQ SCENARIO (M7.1)

VALLEJO FLOOD AND WASTEWATER DISTRICT



EXPOSURE SUMMARIES*

POPULATION COUNT IN HAZARD AREA		PARCEL COUNT IN HAZARD AREA		PARCEL VALUE IN HAZARD AREA		CRITICAL INFRASTRUCTURE COUNTS IN HAZARD AREA			
Count	Exp. Rate**	Count	Exp. Rate**	Sum of Improvement Value	Exp. Rate**	Infrastructure Category	Count	Exp. Rate**	Count/Sum Includes:
120,992	100%	36,470	100%	\$16,941,129,441	100%	Essential Facilities	0	0%	S+++E
Count Includes: S+++E		Count Includes: S+++E		Sum of Content Value		High Potential Loss	19,054	100%	Sum of Transportation & Lifeline Linear Mileage
				\$9,975,727,938	100%	Transportation & Lifeline	0	0%	591
				Count Includes: S+++E					



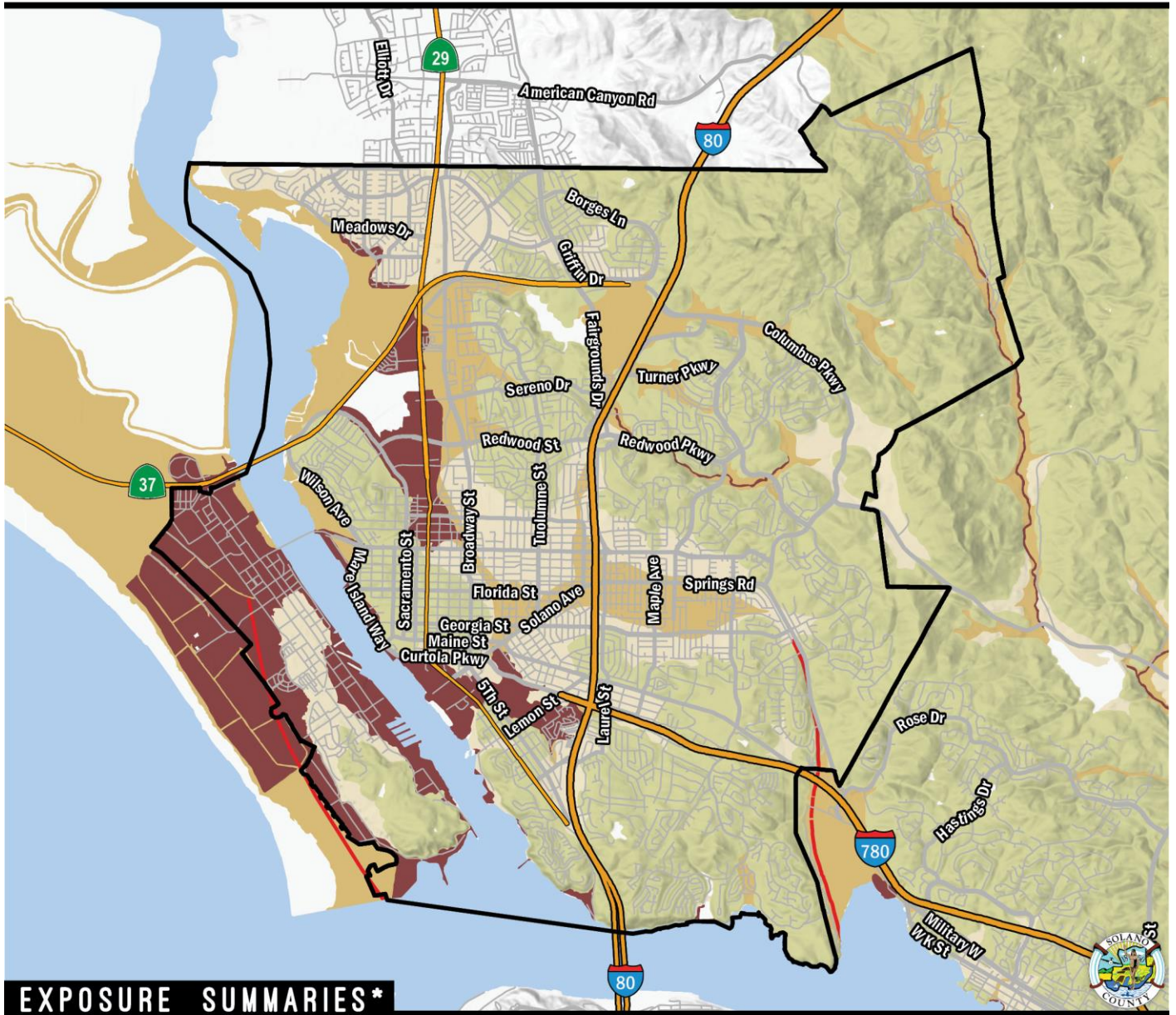
*Exposure summaries include strong, very strong, violent, and severe MMI classes. Hazard data source: USGS.
 **Exposure Rate - Exposed summary or count as a percentage of total summary or count within jurisdiction.
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Figure 9-5: Vallejo Flood and Wastewater District - Hayward-Rodger's Creek EQ Scenario (M7.1)



AREAS WITH POTENTIAL FOR LIQUEFACTION

VALLEJO FLOOD AND WASTEWATER DISTRICT



EXPOSURE SUMMARIES*

POPULATION COUNT IN HAZARD AREA	
Count	Exp. Rate**
20,174	17%
Count Includes: M H VH	

PARCEL COUNT IN HAZARD AREA	
Count	Exp. Rate**
4,496	12%
Count Includes: M H VH	

PARCEL VALUE IN HAZARD AREA	
Sum of Improvement Value	Exp. Rate**
\$2,773,781,543	16%
Sum of Content Value	
\$2,155,691,569	22%
Count Includes: M H VH	

CRITICAL INFRASTRUCTURE COUNTS IN HAZARD AREA			
Infrastructure Category	Count	Exp. Rate**	Count/Sum Includes:
Essential Facilities	0	0%	M H VH
High Potential Loss	3,955	21%	Sum of Transportation & Lifeline Linear Mileage
Transportation & Lifeline	0	0%	



*Exposure summaries include medium, high, very high susceptibility. Hazard data source: USGS.

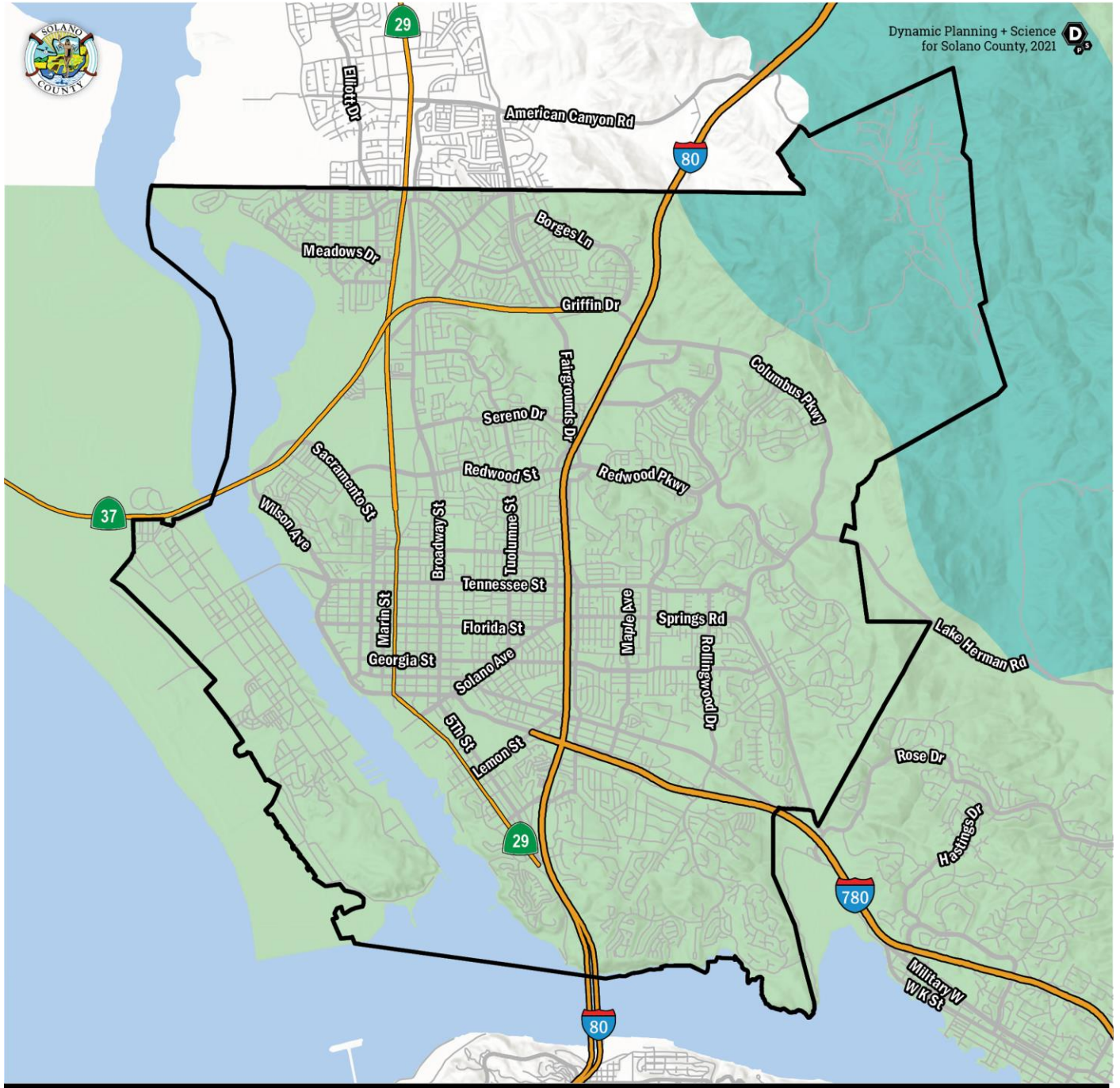
**Exposure Rate - Exposed summary or count as a percentage of total summary or count within jurisdiction.

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Figure 9-6: Vallejo Flood and Wastewater District - Snapshot Layout - Areas with Potential for Liquefaction



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AVERAGE ANNUAL PRECIPITATION (1981-2010, INCHES) VALLEJO FLOOD AND WASTEWATER DISTRICT

*Data sources: USDA - 1981-2010 Annual Average Precipitation by State.

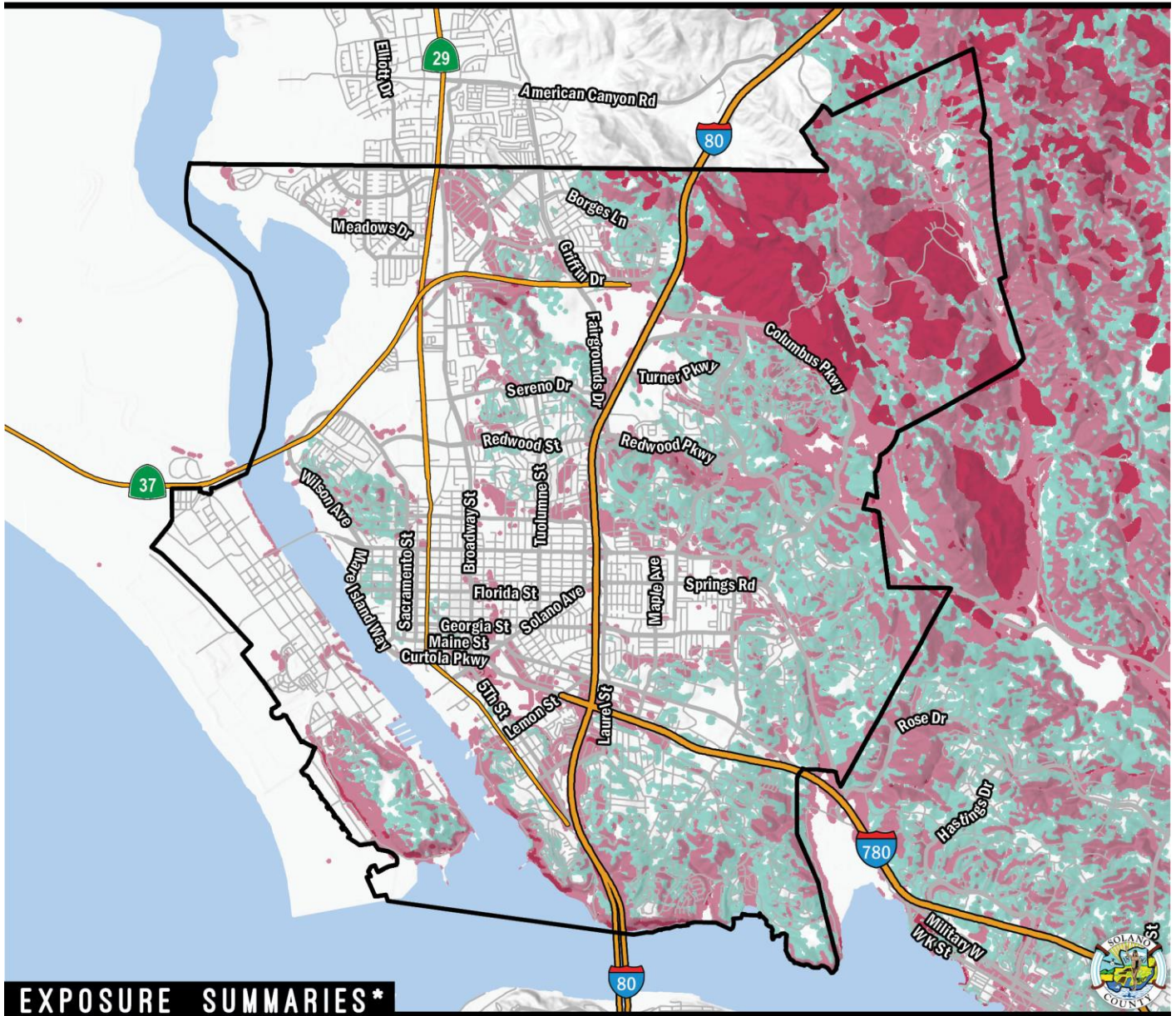
14	18	23	28	33
17	22	27	32	37
INCHES				

Figure 9-7: Vallejo Flood and Wastewater District – Average Annual Precipitation (1981-2010)



LANDSLIDE RISK EXPOSURE

VALLEJO FLOOD AND WASTEWATER DISTRICT



EXPOSURE SUMMARIES*

POPULATION COUNT
IN HAZARD AREA

Count	Exp. Rate**
1,205	1%
Count Includes:	HIGH

PARCEL COUNT
IN HAZARD AREA

Count	Exp. Rate**
240	1%
Count Includes:	HIGH

PARCEL VALUE
IN HAZARD AREA

Sum of Improvement Value	Exp. Rate**
\$162,917,870	1%
Sum of Content Value	
\$81,517,712	1%
Count Includes:	HIGH

CRITICAL INFRASTRUCTURE COUNTS
IN HAZARD AREA

Infrastructure Category	Count	Exp. Rate**	Count/Sum Includes:
Essential Facilities	0	0%	HIGH
High Potential Loss	235	1%	Sum of Transportation & Lifeline Linear Mileage
Transportation & Lifeline	0	0%	

MAP LEGEND

LOW
MODERATE
HIGH

*Exposure summaries include high susceptibility only. Hazard data source: CGS.
**Exposure Rate - Exposed summary or count as a percentage of total summary or count within jurisdiction.

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Figure 9-8: Vallejo Flood and Wastewater District - Snapshot Layout - Landslide Risk Exposure

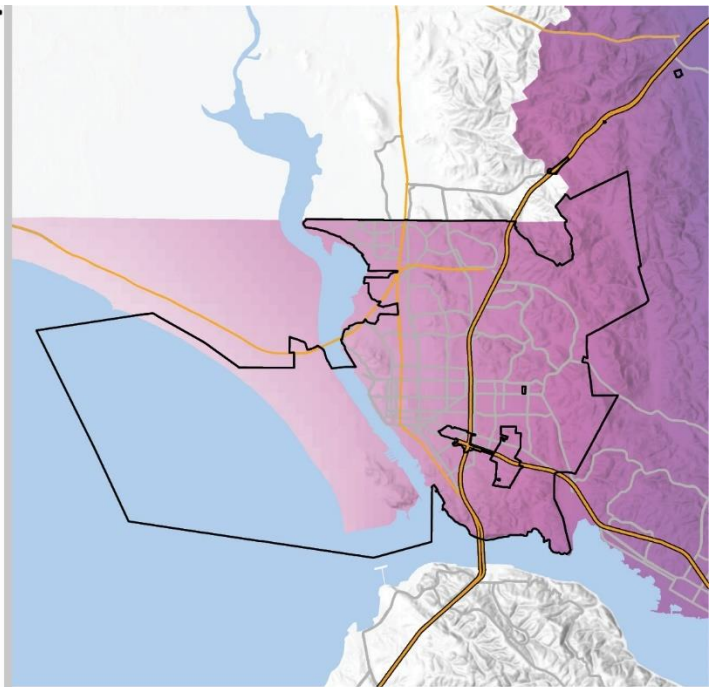


VALLEJO FLOOD AND WASTEWATER DISTRICT AVERAGE ANNUAL MAXIMUM TEMPERATURE

COMPARISON OF CURRENT OBSERVED TO RCP 4.5 AND RCP 8.5 SCENARIOS



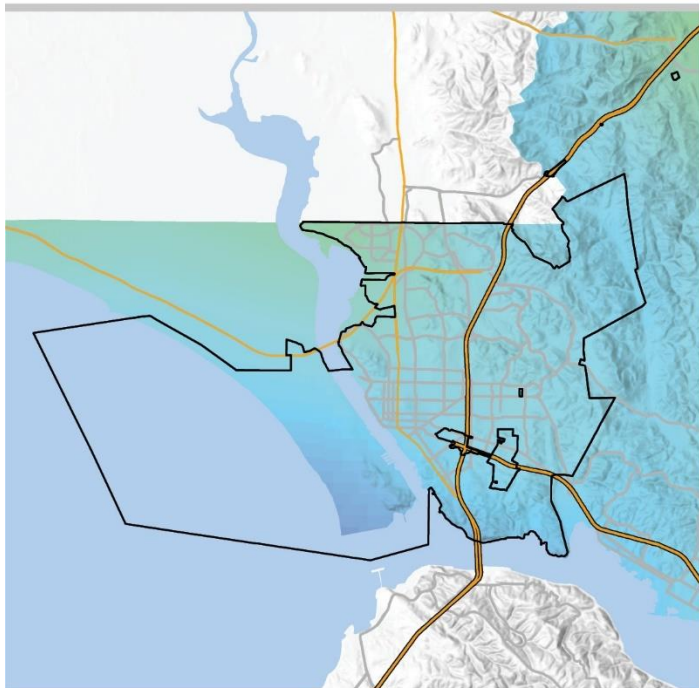
*Data sources: Cal-Adapt CanESM2 RCP 4.5 & 8.5, PRISM 30-YR Norms Annual Max Temp



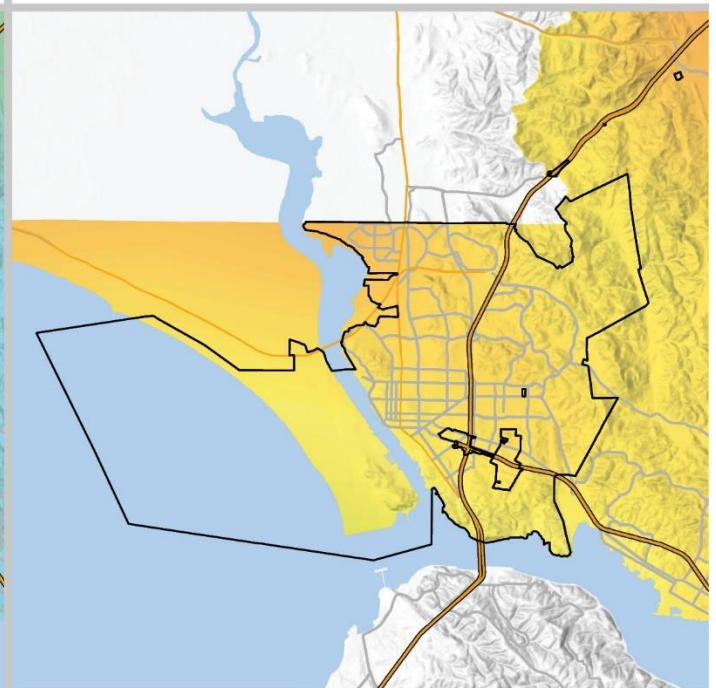
CURRENT 30-YR NORMAL



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RCP 4.5 YEAR 2100



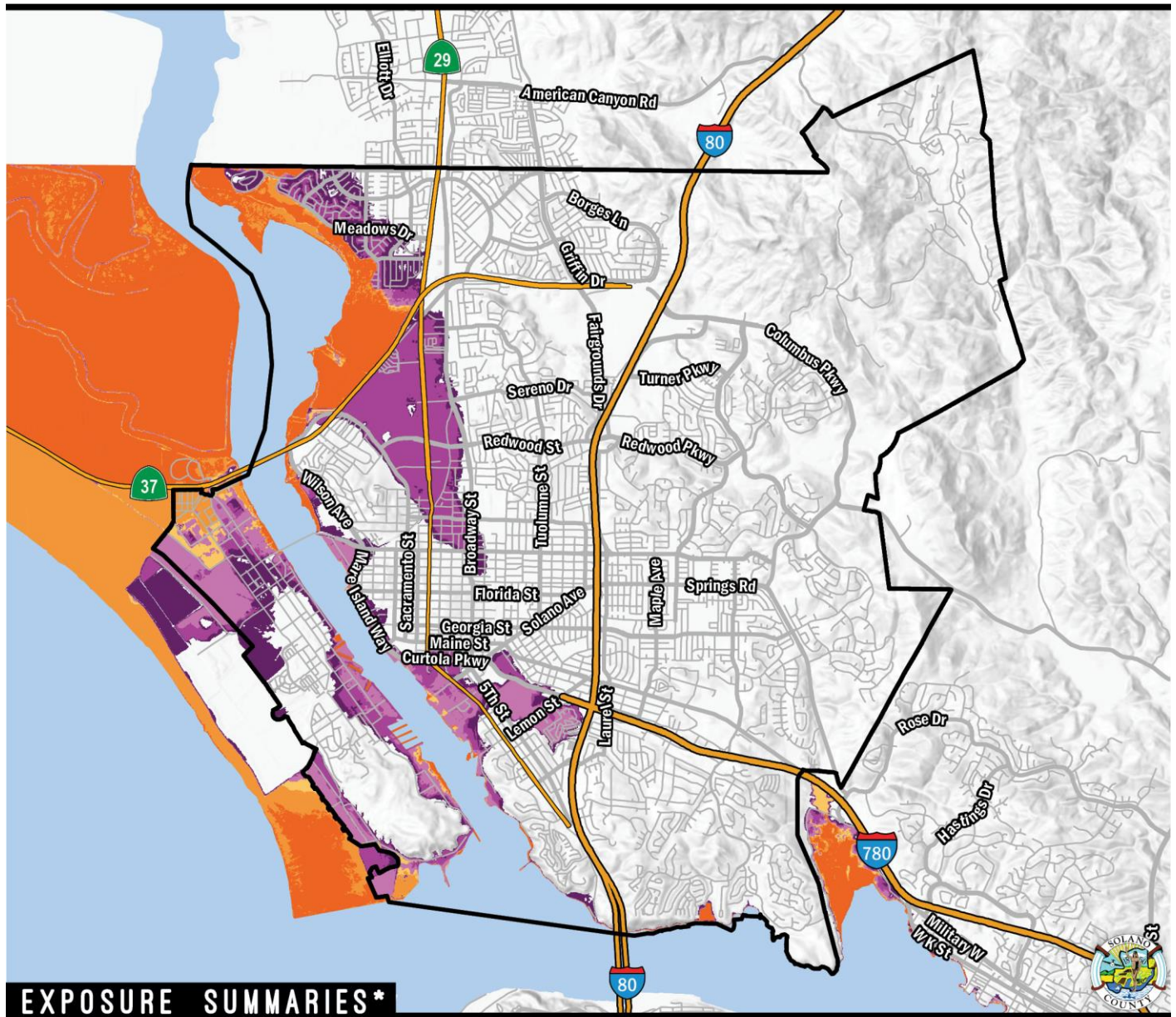
RCP 8.5 YEAR 2100

Figure 9-9: VWFD - RCP Comparison



SEA LEVEL RISE EXPOSURE

VALLEJO FLOOD AND WASTEWATER DISTRICT



EXPOSURE SUMMARIES*

POPULATION COUNT IN HAZARD AREA	
Count	Exp. Rate**
13,875	11%
Count Includes: L+++E	

PARCEL COUNT IN HAZARD AREA	
Count	Exp. Rate**
2,576	7%
Count Includes: L+++E	

PARCEL VALUE IN HAZARD AREA	
Sum of Improvement Value	Exp. Rate**
\$1,730,418,958	10%
Sum of Content Value	
\$1,385,938,842	14%
Count Includes: L+++E	

CRITICAL INFRASTRUCTURE COUNTS IN HAZARD AREA			
Infrastructure Category	Count	Exp. Rate**	Count/Sum Includes:
Essential Facilities	0	0%	L+++E
High Potential Loss	2,468	13%	Sum of Transportation & Lifeline Linear Mileage
Transportation & Lifeline	0	0%	81 14%

MAP LEGEND	
AMOUNT OF RISE	
EXTREME (2.5M)	INTERMEDIATE (1.0M)
HIGH (2.0M)	INTERMEDIATE LOW (0.5M)
INTERMEDIATE HIGH (1.5)	LOW (0.3M)

*Exposure summaries include scenarios low rise to extreme rise. Hazard data source: NOAA.
 **Exposure Rate - Exposed summary or count as a percentage of total summary or count within jurisdiction.

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Figure 9-10: Vallejo Flood and Wastewater District - Sea Level Rise Exposure



Table 9-6: VFWD Damage Estimate Summaries, 100-YR Flood

Building Type	Building Damage (\$)	Building Damage (% of total loss)	Content Damage (\$)	Content Damage (% of total loss)	Total Damage (\$)	Proportion of Loss (%)
VFWD Assets	\$724,307	100.0%	\$1	0.0%	\$724,308	100%
Total	\$724,307	100%	\$1	0%	\$724,308	

Note: Total Inventory Values
 1 - Building Replacement Costs = \$64,719,362
 2 - Content Replacement Costs = \$4,991,429
 3 - Total Value = \$69,710,791

Table 9-7: VFWD Damage Estimate Summary, Concord Green Valley M6.8 Earthquake

Building Type	Average of Potential Damage to Exceed "Slight"	Average of Potential Damage to Exceed "Moderate"	Average of Potential Damage to Exceed "Extensive"	Average Economic Loss for Each Building Category	Sum of Economic Loss	Proportion of Loss (%)
VFWD Assets	25%	10%	2%	\$86,510	\$2,941,356	100%
Total					\$2,941,356	

Note: Total Inventory Values
 1 - Building Replacement Costs = \$64,719,362
 2 - Content Replacement Costs = \$4,991,429
 3 - Total Value = \$69,710,791

Table 9-8: VFWD Damage Estimate Summary, Hayward Rodger's Creek M7.1 Earthquake

Building Type	Average of Potential Damage to Exceed "Slight"	Average of Potential Damage to Exceed "Moderate"	Average of Potential Damage to Exceed "Extensive"	Average Economic Loss for Each Building Category	Sum of Economic Loss	Proportion of Loss (%)
VFWD Assets	22%	8%	1%	\$83,348	\$2,833,830	100%
Total					\$2,833,830	

Note: Total Inventory Values
 1 - Building Replacement Costs = \$64,719,362
 2 - Content Replacement Costs = \$4,991,429
 3 - Total Value = \$69,710,791

For more information on VFWD and hazard vulnerability, see mitigatehazards.com/solanohmp/ramp/.



9.4.3.3 Past and Future Development

Wastewater districts, including the Vallejo Flood and Wastewater District, do not approve development within their established boundaries; instead, they provide conveyance, treatment, reuse, and disposal of wastewater.

Note: as a special district, VFWD is not eligible to participate in the NFIP; therefore, no additional information about the NFIP is included in this annex.

Development since Previous HMP

The District considered its growth since the last HMP and determined it completed several central mitigation actions and decreased its vulnerability to hazards. The District developed an asset management plan and a storm drainage master plan and planned a major storm wall project for future implementation since the last HMP. The District also recently updated design and engineering standards for storm drain and wastewater treatment systems that incorporate sea level rise predictions and strengthen flood protections. This HMP Annex has been revised to reflect these changes in past development and continues to focus on avenues to better mitigate impacts from problematic past development.

Future Development

Future development is overseen and regulated by the City of Vallejo in coordination with the District. Vallejo's General Plan (GP) establishes long-range development policies. The GP provides a basis for private development proposals and public projects to remain consistent with existing city, regional, and state policies. Vallejo's codes include regulations to mitigate the impact of hazards on new and existing development, including:

- Steep slope restrictions for new development,
- Waterbody buffer requirements,
- Floodplain management regulations,
- Zoning that prevents development in hazardous areas of the community such as floodplains, landslide areas, the wildland-urban interface (WUI), or other known hazard areas, and
- Building codes that include the most up-to-date California Fire Code, seismic standards, and many other provisions crafted to protect new construction from hazard events.

Vallejo utilizes the District's standards for the construction of storm drainage systems for larger development.



9.4.3.4 Identify Hazard Problem Statements

As part of the mitigation action identification process, the Planning Committee for each jurisdiction identified areas of concern (aka problem statements) for their respective facilities based on the risk assessment and vulnerability analysis, utilizing the RAMP mapping and static snapshot maps. Problem statements focused on the impact, victim, or threat that the hazard could create in the jurisdiction, as described in Figure 9-11. Identifying common issues and weaknesses through these problem statements assisted the Planning Committee in understanding the realm of resources needed for mitigation. Jurisdiction problem statements are listed in Table 9-9.

The goal is to have at least one mitigation action for every problem statement. Projects or actions have been developed to mitigate each problem identified. See Table 9-14 for a full list of mitigation actions and corresponding problem statements that they address. Each problem statement is coded with a problem number for cross-referencing between Table 9-9 and Table 9-14.

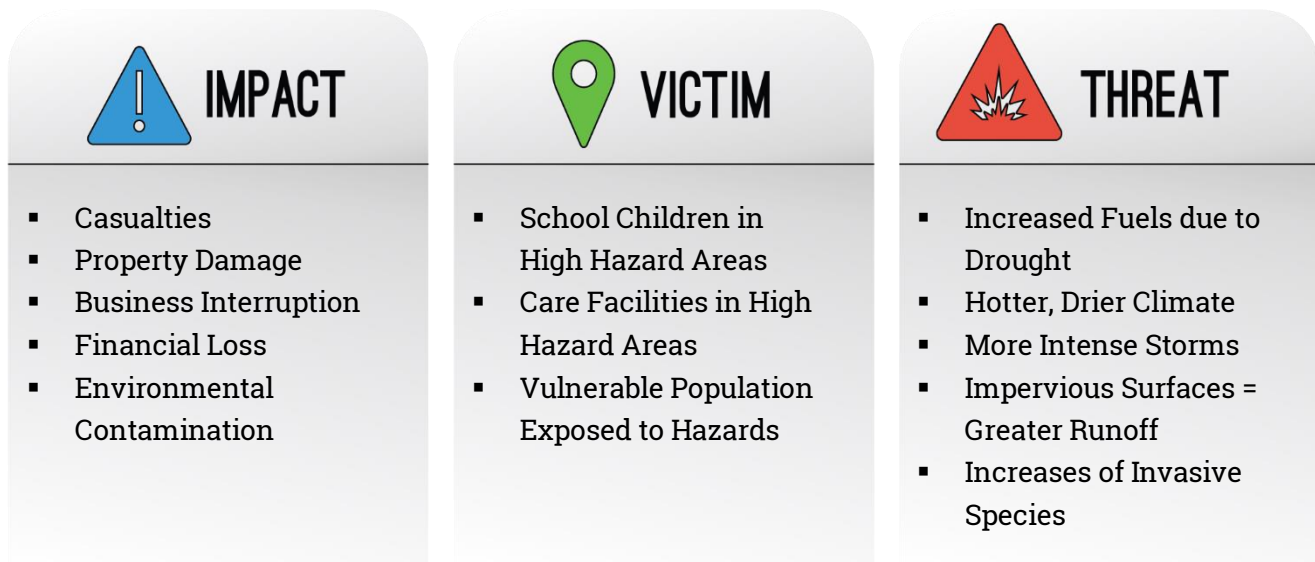


Figure 9-11: Guidance for Problem Statements



Table 9-9: Problem Statements

Problem No.	Hazard Type	Area of Concern	Mitigation Alternatives	Primary Agency	Problem Description	Related MA
ps-FL-VF-186	Flood	Impact	PRV - Prevention , PPRO - Property Protection , NRP - Natural Resource Protection , SP - Structural Projects	Vallejo Flood and Wastewater District	District's Storm Drain Management Plan (2020) identifies 40+ problematic localized flooding areas.	ma-FL-VF-204, ma-FL-VF-204, ma-FL-VF-223, ma-FL-VF-224
ps-AH-VF-188	All Hazard	Impact	PPRO - Property Protection , SP - Structural Projects	Vallejo Flood and Wastewater District	VFWD has an aging facility and infrastructure.	ma-AH-VF-205, ma-AH-VF-218
ps-AH-VF-189	All Hazard		PPRO - Property Protection , SP - Structural Projects	Vallejo Flood and Wastewater District	The Vallejo waterfront community and property owned by VFWD is located along the shoreline and has critical infrastructure that is vulnerable to liquefaction and possible future sea-level rise.	ma-AH-VF-218, ma-AH-VF-211, ma-AH-VF-212
ps-AH-VF-190	All Hazard	Impact	NRP - Natural Resource Protection , SP - Structural Projects	Vallejo Flood and Wastewater District	Flooding and/or sea-level rise may impact Tubbs Island Farm, which the District utilizes for biosolids management and beneficial reuse.	ma-CC-VF-222
ps-FL-VF-191	Flood	Impact	SP - Structural Projects	Vallejo Flood and Wastewater District	Flooding in Austin Creek can render local roadways impassible or severely damaged (such as Hwy 29 and 37).	ma-FL-VF-204, ma-FL-VF-223
ps-FL-VF-192	Flood	Impact	PPRO - Property Protection , SP - Structural Projects	Vallejo Flood and Wastewater District	Flooding can block egress and ingress to neighborhoods.	ma-FL-VF-223, ma-FL-VF-204
ps-FL-VF-193	Flood	Victim	PPRO - Property Protection , PE&A - Public Education & Awareness , SP - Structural Projects	Vallejo Flood and Wastewater District	Flooding in Austin Creek can damage or destroy businesses along Hwy 29.	ma-FL-VF-204, ma-FL-VF-223
ps-FL-VF-194	Flood	Victim	PPRO - Property Protection , SP - Structural Projects	Vallejo Flood and Wastewater District	Redwood Street Fire Station and the parking lot behind the fire station flood in large storm events.	ma-FL-VF-223, ma-FL-VF-204, ma-FL-VF-214



Problem No.	Hazard Type	Area of Concern	Mitigation Alternatives	Primary Agency	Problem Description	Related MA
ps-FL-VF-195	Flood	Threat	PPRO - Property Protection , PE&A - Public Education & Awareness , SP - Structural Projects	Vallejo Flood and Wastewater District	Sea-level rise compounds threat of flooding and increased flood levels.	ma-FL-VF-224, ma-CC-VF-207, ma-CC-VF-209, ma-CC-VF-222, ma-AH-VF-212
ps-SF-VF-196	Slope Failure	Impact	SP - Structural Projects	Vallejo Flood and Wastewater District	Blue Rock Springs Creek experiences slope failure that is applying pressure and may soon damage or destroy sewer lines.	ma-SF-VF-225
ps-EW-VF-197	Extreme Weather	Impact	PPRO - Property Protection	Vallejo Flood and Wastewater District	Localized flooding continues to occur in Sandpiper, Lemon Street – Solano Avenue, Austin Creek, and Lake Chabot watersheds.	ma-FL-VF-204, ma-EW-VF-219, ma-AH-VF-212
ps-EW-VF-198	Extreme Weather	Impact	PRV - Prevention , SP - Structural Projects	Vallejo Flood and Wastewater District	District does not have adequate storage to detain sewage during major storm events that cause inflow and infiltration, which can result in untreated or partially treated sewage reaching waterways.	ma-EW-VF-226
ps-EQ-VF-199	Earthquake	Impact	PPRO - Property Protection , SP - Structural Projects	Vallejo Flood and Wastewater District	Breakage of the force main or other sewer transmission lines, especially along the waterfront, could cause human health and environmental concerns.	ma-EQ-VF-208, ma-EQ-VF-220
ps-EQ-VF-200	Earthquake	Impact	PPRO - Property Protection , SP - Structural Projects	Vallejo Flood and Wastewater District	Wastewater treatment plant, sewage collection pipes, and other facilities could experience breakages that cause service disruptions.	ma-EQ-VF-208
ps-EQ-VF-201	Earthquake	Impact	PPRO - Property Protection , SP - Structural Projects	Vallejo Flood and Wastewater District	Water treatment buildings are vulnerable to liquefaction impacts.	ma-EQ-VF-227
ps-CC-VF-202	Climate Change	Impact	PPRO - Property Protection , NRP - Natural Resource Protection , SP - Structural Projects	Vallejo Flood and Wastewater District	The Meadows sub-development, in the northern portion of the District's system, is already experiencing some tidal influence and higher groundwater levels due to sea level rise.	ma-CC-VF-207, ma-CC-VF-209
ps-CC-VF-208	Climate Change	Threat	PE&A - Public Education & Awareness , SP - Structural Projects	Vallejo Flood and Wastewater District	Cycles of drought and extreme rain events are predicted to worsen due to climate change.	ma-EW-VF-219, ma-EW-VF-226



9.4.4 Mitigation Action Support Tool (MAST)

As a living document, hazard problem statements and mitigation activities will be updated through a web interface application developed specifically for participating jurisdictions. The Mitigation Action Support Tool (MAST) is accessible through mitigatehazards.com/SolanoHMP/.

MAST is a web-based interactive tool that enables multiple users to search, view, enter, and update mitigation actions, ideas or projects, and other information. MAST provides participating jurisdictions and plan reviewers (Cal OES/FEMA) access to valuable mitigation information that can be leveraged by future planning or other risk reduction efforts within the County. Participating jurisdictions can update the status of their mitigation projects throughout the planning lifecycle, and this web-based tool will improve participating jurisdiction's ability to apply for FEMA's Hazard Mitigation Assistance (HMA) grant programs including initial grant application processes through al OES.

9.5 Mitigation Strategy

The mitigation strategy is the guidebook to future hazard mitigation administration, capturing the key outcomes of the MJHMP planning process. The mitigation strategy is intended to reduce vulnerabilities outlined in the previous section (a.k.a. problem statements) with a prescription of policies and physical projects. These mitigation actions should be compatible with existing planning mechanisms and should outline specific roles and resources for implementation success.

9.5.1 Capabilities & Adaptive Capacity Assessment

This section examines the planning and regulatory, administrative, technical, financial, educational, and outreach capabilities to augment known issues and weaknesses from identified natural hazards.

Capabilities assessments in this Volume 1 and in Volume 2 include considerations of a community's adaptive capacity for climate change, as outlined in Cal OES' 2020 California Adaptation Planning Guide. Adaptive capacity is a community or region's existing ability to moderate climate change impacts. Assessing adaptive capacity includes analysis of policies, plans, programs, funding, and staffing capacity.

The tables in this section explore various local planning mechanisms, administrative capacity, financial capabilities, and education and outreach initiatives. The columns in each table represent deeper dives into the following questions:

- Is the existing planning or regulatory mechanism used currently? (Column 1, Status)
- Has the HMP been integrated into the planning mechanism currently so that the named mechanism is currently used in HMP planning? (Column 2, Current Mitigation Use)
- Is there a future opportunity to expand, improve upon, and incorporate this 2020 HMP Update into the planning or regulatory mechanism? (Column 3, Future Opportunity)



The capabilities assessment is easily-digestible and based on color coding to indicate which policies and plans are adequate, need improvement or in which the HMP could be integrated. Each table includes a legend that explain how each one of these questions are being answered according to the color indicated: green, yellow, and orange.

For more information on the regulatory environment surrounding each hazard, see hazard-specific sections of Volume 1. Volume 1, Section 5.3.5 includes an extensive list of federal and state funding opportunities as well.

9.5.1.1 Planning and Regulatory Capabilities

Table 9-10: Planning and Regulatory Capabilities

CAPABILITY ASSESSMENT LEGEND		
Status	Current Mitigation Use	Future Opportunity
Currently in use or present.	Used widely for mitigation.	Opportunity to expand and integrate.
(Sort of) Seldomly used or limited presence.	Limited use in mitigation planning.	Limited opportunity to expand and integrate.
(No) Not present or available.	Not used in mitigation planning.	No opportunity to expand or integrate.

Resource	HMP Integration			Notes / Additional Detail
	Status	Current Mitigation Use	Future Opportunity	
Planning and Regulatory Capabilities				
Hazard Reduction Programs (Annually Conducted)				
Capital Improvements Program (CIP) or Plan	Green	Yellow	Green	10-Year Capital Infrastructure Plan.
Erosion/Sediment Control Program	Orange	Orange	Yellow	
Hazard-Related Public Outreach Program	Orange	Orange	Yellow	
Stormwater Management Program (Annual Inspections)	Yellow	Yellow	Green	
Seismic Safety Program (Non-structural Inspections)	Orange	Orange	Green	
Earthquake Modernization Program (Building Safety Inspections)	Orange	Orange	Green	
Hazard Plans				
General Plan Safety Element	Orange	Orange	Orange	
Noteworthy Area/ Specific Plan with Hazard Focus	Green	Green	Green	2016 Vallejo Sanitation & Flood Control District LHMP (currently being updated)
Community Wildfire Protection Plan (CWPP)	N/A	N/A	N/A	
Wildfire Vulnerability Assessment	Orange	Orange	Green	



Resource	HMP Integration			Notes / Additional Detail
	Status	Current Mitigation Use	Future Opportunity	
Planning and Regulatory Capabilities				
Urban or Integrated Regional Water Management Plan				2015 City of Vallejo Urban Water Management Plan
Floodplain Management Plan				Storm Drain Master Plan (2020)
Stormwater Management Plan				Storm Drain Master Plan (2020)
Ground Water Management Plan(s)	N/A	N/A	N/A	
Open Space and Land Management Plan(s)				
Emergency Operations Plan	N/A	N/A	N/A	
Climate Action Plan, Vulnerability Ass'mt, or Adaptation Plan				2011 County of Solano Climate Action Plan
Hazard Plans				
Local Delta/ Wetlands Program(s)				
Downtown Plan with hazard focus	N/A	N/A	N/A	
Community Health Assessment(s)				
National Flood Protection Program (NFIP)				
Floodplain Management Regulations	N/A	N/A	N/A	City of Vallejo jurisdiction
Flood Insurance Education and Technical Assist.				
Flood Hazard Mapping / Re-Mapping				2013 Flood Insurance Study
Community Rating System (CRS)	N/A	N/A	N/A	City of Vallejo jurisdiction



9.5.1.2 Administrative and Technical Capabilities

Table 9-11: Administrative and Technical Capabilities

CAPABILITY ASSESSMENT LEGEND		
Status	Current Mitigation Use	Future Opportunity
Currently in use or present.	Used widely for mitigation.	Opportunity to expand and integrate.
(Sort of) Seldomly used or limited presence.	Limited use in mitigation planning.	Limited opportunity to expand and integrate.
(No) Not present or available.	Not used in mitigation planning.	No opportunity to expand or integrate.

Resource	HMP Integration			Notes / Additional Detail
	Status	Current Mitigation Use	Future Opportunity	
Administrative and Technical				
Community Planning and Development Services				
Community Planner	N/A	N/A	N/A	District does not review and approve development
Civil Engineer				
Building Code Official	N/A	N/A	N/A	
Floodplain Administrator				
Fire Marshall	N/A	N/A	N/A	
GIS Specialist and Capability				
Emergency Manager				
Warning Systems/Services				
General			N/A	Alert Solano, County system in place, not under jurisdiction of VFWD for all in this category.
Flood			N/A	Emergency Alert: Alert Solano Flood Risk: California Department of Water Resources Flood Risk Notification Program Flood Control: Solano County Water Agency
Wildfire			N/A	Alert Solano
Geological Hazards			N/A	Alert Solano; ShakeAlert.org (nation-wide)



9.5.1.3 Financial Capabilities

Table 9-12: Financial Capabilities

CAPABILITY ASSESSMENT LEGEND		
Status	Current Mitigation Use	Future Opportunity
Currently in use or present.	Used widely for mitigation.	Opportunity to expand and integrate.
(Sort of) Seldomly used or limited presence.	Limited use in mitigation planning.	Limited opportunity to expand and integrate.
(No) Not present or available.	Not used in mitigation planning.	No opportunity to expand or integrate.

Resource	HMP Integration			Notes / Additional Detail
	Status	Current Mitigation Use	Future Opportunity	
Fiscal Capabilities				
Financial Resources for Hazard Mitigation				
Levy for Specific Purposes with Voter Approval				
Utilities Fees				
Benefit assessments				
System Development Fee				
Various Bonds to Incur Debt				
Stormwater Service Fees				Any stormwater fee increase would require voter approval.
Capital Improvement Project Funding with Voter Approval				



9.5.1.4 Education and Outreach

Table 9-13: Education and Outreach Capabilities

CAPABILITY ASSESSMENT LEGEND		
Status	Current Mitigation Use	Future Opportunity
Currently in use or present.	Used widely for mitigation.	Opportunity to expand and integrate.
(Sort of) Seldomly used or limited presence.	Limited use in mitigation planning.	Limited opportunity to expand and integrate.
(No) Not present or available.	Not used in mitigation planning.	No opportunity to expand or integrate.

Resource	HMP Integration			Notes / Additional Detail
	Status	Current Mitigation Use	Future Opportunity	
Education / Outreach Capabilities				
Education/Outreach Resources				
Website Dedicated to Hazard Topics				Flooding information: https://www.vallejowastewater.org/214/Flooding
Dedicated Social Media				
Hazard Info. Avail. at Library/ Planning Desk				Available through inquiries to staff and assistance accessing FEMA floodplain maps
Annual Public Safety Events				
Ability to Field Public Tech. Assistance Requests				
Public Safety Newsletters or Printed Outreach				
Fire Safe Councils	N/A	N/A	N/A	
Resource Conservation Districts				Solano Resource Conservation District
Other				



9.5.2 Mitigation Actions

Mitigation actions were developed based upon the jurisdiction’s priorities, risk assessment results, and mitigation alternatives. The mitigation action prioritization method used by all participating jurisdictions is described in Section 5.5.1 of Volume 1. Table 9-14 lists each priority mitigation action, responsible party, time frame, potential funding source, implementation steps, and resources need to implement based upon the Planning Committee consensus.

Each participating jurisdiction, including the Vallejo Flood and Wastewater District, considered ongoing relevancy of mitigation actions from the existing MJHMP and retained or removed such actions while adding new relevant actions as well. Mitigation actions were examined for relevancy and the potential for future implementation and then evaluated for potential follow-up. Some mitigation actions developed during the previous HMP effort were not included because they were an inherent part of the HMP update process or were not detailed enough for implementation at a local Jurisdiction level. the Vallejo Flood and Wastewater District has made significant changes to other mitigation actions because of the updated risk assessment and implementation strategy, to include more detail, or to update based on current mitigation practices.

Volume 1, Section 5.5.2 provides a record of County wide mitigation actions, the status, and additional notes for each action.

Table 9-14 lists each mitigation action for the Vallejo Flood and Wastewater District. Each participating jurisdiction developed unique mitigation actions, targeted at their own unique priorities and vulnerabilities. Each mitigation action identifies the responsible party, time frame, potential funding source, implementation steps and resources needed to implement these priority mitigation actions. As a living document, hazard problem statements and mitigation activities will be updated through MAST. The detail in Table 9-14 meets the regulatory requirements of FEMA and DMA 2000.

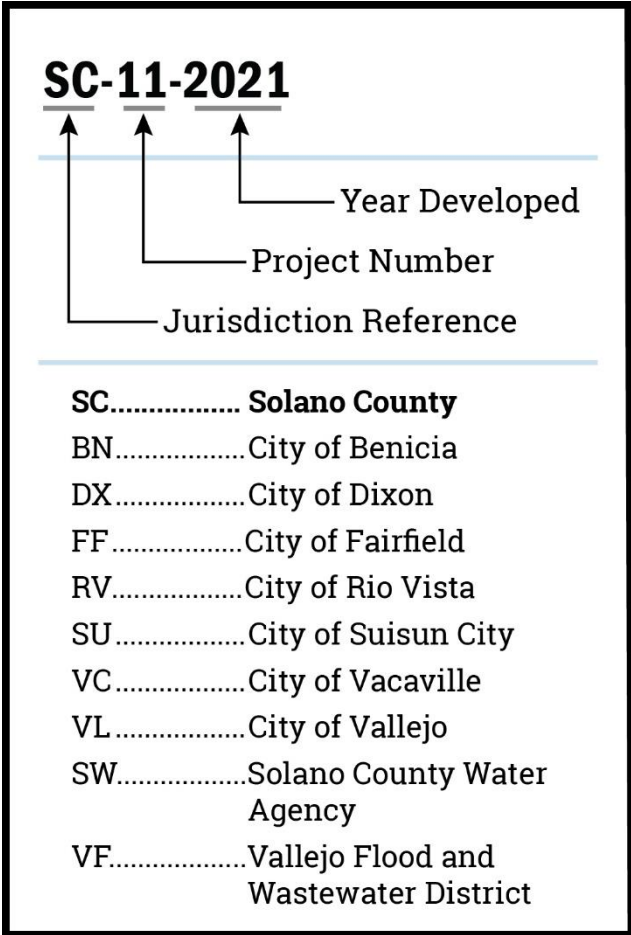


Figure 9-12: Mitigation Action Key

Table 9-14: Vallejo Flood and Wastewater District Mitigation Actions

Mitigation No.	Hazard Type	Mitigation Type	Status	Year	Primary Agency	Title/Description	Responsible Party	Estimated Cost	Estimated Benefit	Time Frame	HMA Activity Type	Potential Grant Source	Priority	Goal	Related Problem Statements
ma-AH-VF-212	All Hazard	PE&A - Public Education & Awareness	Ongoing	2017	Vallejo Flood and Wastewater District	Continue to educate the public in the natural disaster exposures that are in our Vallejo Community, including through existing public outreach/ education program, Sandbag Program, and outreach to other public agencies.	Risk Management	Medium - The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.	Medium - Project will have a long-term impact on the reduction of risk exposure for life and property, or project will not provide an immediate reduction in the risk exposure for property.	3-5 Years	5%	HMGP / BRIC , Internal Funding	Low	Goal 4: Resilience	ps-AH-VF-189, ps-EW-VF-197, ps-FL-VF-195
ma-AH-VF-218	All Hazard	PRV - Prevention	Pending	2021	Vallejo Flood and Wastewater District	Update and enhance the District's asset management plan.	All departments	Medium - The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.	High - Project will provide an immediate reduction of risk exposure for life and property.	3-5 Years	N/A	Internal Funding	High	Goal 2: Infrastructure , Goal 4: Resilience	ps-AH-VF-188, ps-AH-VF-189
ma-CC-VF-209	Climate Change	PRV - Prevention	Ongoing	2017	Vallejo Flood and Wastewater District	Mitigate climate change impacts, including drought, by integrating climate change research and adaptation planning into District operations and services.	Operations; Environmental Services	High - Existing funding will not cover the cost of the project; implementation would require new revenue through an alternative source (for example, bonds, grants, and fee increases).	High - Project will provide an immediate reduction of risk exposure for life and property.	3-5 Years	Planning	HMGP / BRIC , Internal Funding	High	Goal 4: Resilience	ps-CC-VF-202, ps-FL-VF-195
ma-CC-VF-222	Climate Change	NRP - Natural Resource Protection	Pending	2021	Vallejo Flood and Wastewater District	Implement engineering and construction of identified projects to protect Tubbs Island from sea level rise.	Operations & Maintenance; Finance	High - Existing funding will not cover the cost of the project; implementation would require new revenue through an alternative source (for example, bonds, grants, and fee increases).	High - Project will provide an immediate reduction of risk exposure for life and property.	5-10 Years	Planning	HMGP / BRIC , Internal Funding	Medium	Goal 3: Environment , Goal 4: Resilience	ps-AH-VF-190, ps-FL-VF-195
ma-EQ-VF-208	Earthquake	PE&A - Public Education & Awareness	Ongoing	2017	Vallejo Flood and Wastewater District	Assist the local government in preparing for and addressing water main breaks; coordinate to assess infrastructure and coordinate and supply assistance to City during earthquake response.	Director; Risk Management	Medium - The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.	Medium - Project will have a long-term impact on the reduction of risk exposure for life and property, or project will not provide an immediate reduction in the risk exposure for property.	Ongoing	5%	HMGP / BRIC , Internal Funding	High	Goal 4: Resilience	ps-EQ-VF-199, ps-EQ-VF-200
ma-EQ-VF-220	Earthquake	PRV - Prevention	Ongoing	2021	Vallejo Flood and Wastewater District	Continue maintaining potable water certifications and water treatment trainings to enable quick assistance with Vallejo drinking water systems in event of earthquake event	Engineering; Risk Management	Low - The project could be funded under the existing budget. The project is part of or can be part of an ongoing existing program.	High - Project will provide an immediate reduction of risk exposure for life and property.	Ongoing	N/A	N/A	Medium	Goal 1: People , Goal 2: Infrastructure , Goal 4: Resilience	ps-EQ-VF-199

Mitigation No.	Hazard Type	Mitigation Type	Status	Year	Primary Agency	Title/Description	Responsible Party	Estimated Cost	Estimated Benefit	Time Frame	HMA Activity Type	Potential Grant Source	Priority	Goal	Related Problem Statements
ma-EQ-VF-227	Earthquake	PPRO - Property Protection	Pending	2021	Vallejo Flood and Wastewater District	Evaluate options to reduce treatment plan buildings' exposure to liquefaction risks.	Engineering; Risk Management	Medium - The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.	Medium - Project will have a long-term impact on the reduction of risk exposure for life and property, or project will not provide an immediate reduction in the risk exposure for property.	3-5 Years	Planning	HMGP / BRIC	Medium	Goal 2: Infrastructure	ps-EQ-VF-201
ma-EW-VF-219	Extreme Weather	PRV - Prevention	Pending	2021	Vallejo Flood and Wastewater District	Develop an asset management plan for District storm drainage assets (or fold into existing asset management plan)	Finance; Operations & Maintenance	High - Existing funding will not cover the cost of the project; implementation would require new revenue through an alternative source (for example, bonds, grants, and fee increases).	High - Project will provide an immediate reduction of risk exposure for life and property.	3-5 Years	Planning	HMGP / BRIC , Internal Funding	High	Goal 4: Resilience	ps-EW-VF-197, ps-CC-VF-208
ma-EW-VF-226	Extreme Weather	SP - Structural Projects	Pending	2021	Vallejo Flood and Wastewater District	Implement Water Treatment Plant Master Plan to retain storm waters to adequate degree during major storm events to prevent early discharge from treatment plant.	Finance; Environmental Services	High - Existing funding will not cover the cost of the project; implementation would require new revenue through an alternative source (for example, bonds, grants, and fee increases).	High - Project will provide an immediate reduction of risk exposure for life and property.	5-10 Years	Project	HMGP / BRIC , Internal Funding	High	Goal 2: Infrastructure , Goal 3: Environment , Goal 4: Resilience	ps-EW-VF-198, ps-CC-VF-208
ma-FL-VF-204	Flood	SP - Structural Projects	Pending	2021	Vallejo Flood and Wastewater District	Implement projects identified in the District's Storm Drain Master Plan (2020).	Finance; Engineering; Operations	High - Existing funding will not cover the cost of the project; implementation would require new revenue through an alternative source (for example, bonds, grants, and fee increases).	High - Project will provide an immediate reduction of risk exposure for life and property.	5-10 Years	Project	HMGP / BRIC , FMA , CDBG DRI , Internal Funding , N/A	High	Goal 1: People , Goal 2: Infrastructure , Goal 4: Resilience	ps-FL-VF-186, ps-EW-VF-197, ps-FL-VF-186, ps-FL-VF-191, ps-FL-VF-192, ps-FL-VF-193, ps-FL-VF-194
ma-FL-VF-214	Flood	PPRO - Property Protection	Ongoing	2017	Vallejo Flood and Wastewater District	Continue to support the City in its participation in National Flood Insurance Program (NFIP). Work with City of Vallejo to mitigate watershed improvements that would downgrade the rating in flood zones.	Field Operations	Medium - The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.	High - Project will provide an immediate reduction of risk exposure for life and property.	Ongoing	Project	HMGP / BRIC , FMA , Internal Funding	Low	Goal 2: Infrastructure , Goal 4: Resilience	ps-FL-VF-194
ma-FL-VF-223	Flood	SP - Structural Projects	Pending	2021	Vallejo Flood and Wastewater District	Conduct prioritization exercise for implementation actions identified in the Storm Drainage Master Plan, including potential packages of projects for grant funding.	Financing; Environmental Services	Medium - The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.	Medium - Project will have a long-term impact on the reduction of risk exposure for life and property, or project will not provide an immediate reduction in the risk exposure for property.	1-3 Years	Planning	HMGP / BRIC , Internal Funding	High	Goal 2: Infrastructure , Goal 4: Resilience	ps-FL-VF-186, ps-FL-VF-191, ps-FL-VF-192, ps-FL-VF-193, ps-FL-VF-194

Mitigation No.	Hazard Type	Mitigation Type	Status	Year	Primary Agency	Title/Description	Responsible Party	Estimated Cost	Estimated Benefit	Time Frame	HMA Activity Type	Potential Grant Source	Priority	Goal	Related Problem Statements
ma-FL-VF-224	Flood	PPRO - Property Protection	Pending	2021	Vallejo Flood and Wastewater District	Coordinate with City to understand repetitive loss impacts and which projects in Storm Drainage Master Plan (2021) may address repetitive loss properties. Integrate information into prioritization of Storm Drainage Master Plan projects.	Risk Management; Operations & Maintenance	Medium - The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.	High - Project will provide an immediate reduction of risk exposure for life and property.	1-3 Years	N/A	HMGP / BRIC , FMA , Internal Funding	High	Goal 4: Resilience	ps-FL-VF-186, ps-FL-VF-195
ma-SF-VF-225	Slope Failure	NRP - Natural Resource Protection	Pending	2021	Vallejo Flood and Wastewater District	Analyze options to protect sewer lines from erosion in Blue Rock Springs Creek.	Operations & Maintenance	High - Existing funding will not cover the cost of the project; implementation would require new revenue through an alternative source (for example, bonds, grants, and fee increases).	High - Project will provide an immediate reduction of risk exposure for life and property.	3-5 Years	Planning	HMGP / BRIC , Internal Funding	Medium	Goal 3: Environment , Goal 4: Resilience	ps-SF-VF-196



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