

# SAFETY

# 5

Every general plan in California must address natural and human-made hazards and dangers, and identify the potential risk of death, injuries, property damage, and economic and social dislocation from fires, floods, earthquakes, and other events. Public safety and emergency response are top priorities in Stockton, but not just in relation to widespread events. Concerns over personal safety weigh heavily on many neighborhoods, even to the point of discouraging residents from recreating or traveling along specific routes or at certain times of day. The focus of this chapter is on improving public safety and reducing the risk of hazards. The chapter is organized around four key goals that represent the priorities of the Stockton community:

- **Safe Community**
- **Hazard Protection**
- **Clean Water**
- **Clean Air**



## GOALS, POLICIES, AND ACTIONS

### GOAL SAF-1: SAFE COMMUNITY

Create a safe and welcoming environment in all areas of the city at all times of day.

### PUBLIC SAFETY IS A TOP COMMUNITY PRIORITY

Violence and crime prevention are major issues for the Stockton community. As one of the City's strategic initiatives to reduce violence and crime and increase public safety, the Stockton Marshall Plan, funded by a ¾-cent sales tax approved by voters in 2013, emphasizes data-based targeting of "focus area" locations and predictive policing to achieve the objectives of preventing and stopping violence and building violence-prevention capacity.

Design of the built environment can also help prevent crime and increase both the sense and reality of safety. Research has shown that the most effective deterrent to criminal activity is the risk of being caught, and design of public spaces that places more eyes on the street and limits access points can create safer environments. Strategies for Crime Prevention Through Environmental Design (CPTED) include locating windows to overlook sidewalks and parking lots, increasing pedestrian and bicycle traffic, and installing fencing, landscaping, or lighting to control access. Well-maintained buildings and property also signal alert, active owners and can deter criminal activity.

The Stockton Police Department (SPD) and Fire Department (SFD) provide essential services to keep the community safe; police and fire stations are shown on Figure 5-1. The SPD provides professional law enforcement based on a model of prediction, prevention, pursuit, and partnerships. This model combines policing and enforcement strategies with community

involvement and engagement. Through its commitment to community policing, the SPD has established a variety of mentorship programs and training classes that promote proactive partnership with neighborhood organizations and business owners to identify and solve issues.

The SFD mission is centered on providing excellent emergency and non-emergency services through public education, prevention, and aggressive suppression and rescue activities. The SFD is an all-hazard fire department, capable of mitigating all types of both human-made and natural disasters. As such, the fire department has the following specialized teams:

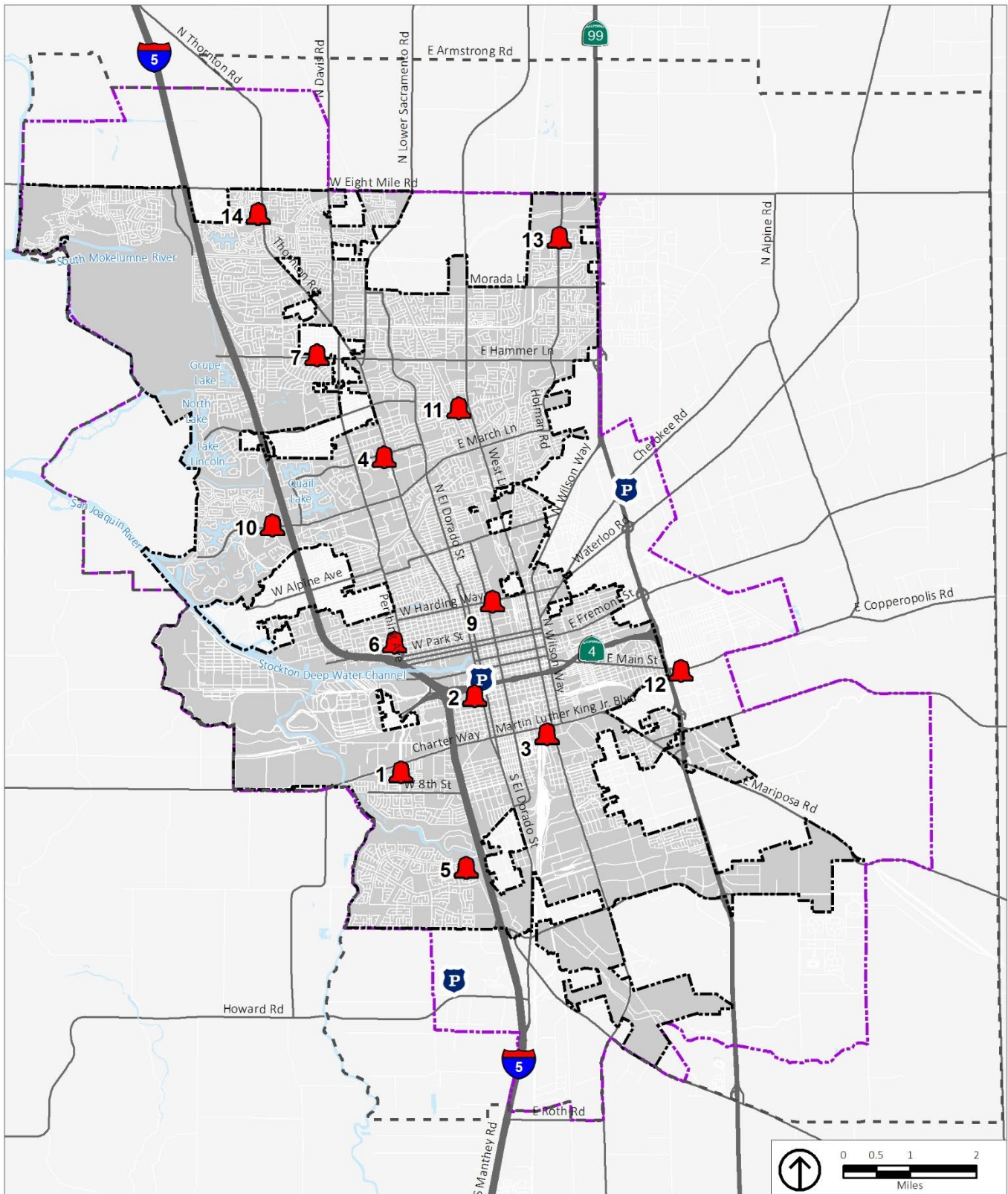
- **Hazardous Materials Team:** A California Office of Emergency Services Type II Hazardous Materials Team staffed with seven personnel daily, trained to the Hazardous Materials Technician and Specialist level. Specialty apparatus and personnel are assigned to Fire Company 3.
- **Water Rescue Team:** Staffed by a team of four personnel daily, the water rescue team is capable of both surface and sub-surface water rescues, helping to protect over 1,000 miles of waterways surrounding the city. The team has specialty apparatus including personal watercraft, inflatable boats, and a water rescue vehicle. The Water Rescue Team is assigned to Fire Company 6. In addition to City resources, the California Office of Emergency Services has also assigned the City a tow vehicle and trailer (OES Boat Team #13) for deployment anywhere in the United States.

■ **Urban Search and Rescue (USAR) Team:**

Staffed by a team of seven personnel daily, the USAR Team is trained in rope rescue, confined space rescue, trench rescue, and building collapse. The team utilizes specialty apparatus including a Type I heavy rescue, and a California Office of Emergency Services Rescue Trailer.

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**Figure 5-1**  
**Police and Fire Stations**



Source: City of Stockton; San Joaquin County; PlaceWorks, 2017.

-  Fire Stations (Station ID #)
-  Police Stations
-  City Limit
-  Sphere of Influence
-  General Plan Planning Area

To reinforce their public service model, the SFD offers a variety of volunteer programs including the Community Emergency Response Team (CERT), which provides training to residents and members of the business community to increase disaster awareness and emergency response capability, as well as the Stockton Fire Explorers and Stockton Fire Auxiliaries. The City and San Joaquin County coordinate for response in emergency situations, and SFD offers disaster preparedness training opportunities through the CERT program. The risk of wildfire in the Planning Area is considered relatively low, given the lack of forest or grassland area that could serve as fuel sources for a wildfire.

Measure W was approved by voters November 2, 2004. It was originally adopted by Ordinance 038-04 C.S., and is codified in Section 3.52 of the Stockton Municipal Code, entitled Funding for Police and Fire Protection Services. The ordinance provides for a ¼-cent (0.25 per cent) transaction and use tax (i.e., sales tax), a tax dedicated to providing for police and fire personnel and services. The ordinance calls for Program Guidelines, which were developed and adopted by the City Council, August 4, 2004. The Program Guidelines prescribe two methods of ensuring that tax monies collected are used as specified by the ordinance. The first method is an independent audit and the second method is a citizens' committee. Measure W provides funding for 23 suppression positions within the SFD.

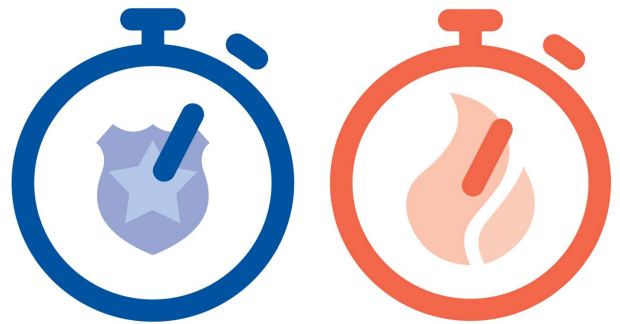
Public safety staffing and response time standards provide a means to ensure that the community will remain safe as the city develops. The City strives to achieve the following public safety standards:

- **Police Staffing:** 1.5 sworn officers per 1,000 residents.
- **Police Response Times:** Average law enforcement response time of 5 minutes or less for priority one calls (where a threat to persons may exist).

- **Fire Staffing:** 1.23 sworn firefighters per 1,000 residents for a population up to 500,000 people.

- **Fire Response Times:**

- 240 seconds or less travel time for the arrival of the first arriving engine company at a fire suppression incident.
- For other than high-rise, 480 seconds or less travel time for the deployment of an initial full alarm assignment at a fire suppression



incident.

- For high-rise, 610 seconds or less travel time for the deployment of an initial full alarm



assignment at a fire suppression incident.

#### POLICY SAF-1.1

**Invest in neighborhood safety through partnerships with the community to help prevent violence and crime ("community policing").**

**Action SAF-1.1A**

Promote public safety programs, including business, neighborhood, and school watches; child identification and fingerprinting; and other public education efforts.

**Action SAF-1.1B**

Maintain and expand community outreach programs to improve the community's understanding of how the criminal justice system works, foster a positive relationship between community members and public safety staff, provide a venue for open dialog, and promote transparency in public safety.

**Action SAF-1.1C**

Engage with schools, non-profit organizations, and faith-based organizations to recognize and work with at-risk youth to avert future criminal activity.

**POLICY SAF-1.2**

**Reduce community violence and crime by fostering community connectivity, creating a sense of place, and encouraging social interactions between residents, employees, and business owners.**

**Action SAF-1.2A**

Update the City's Design Guidelines and Development Code to require new and retrofitted development to support effective police and fire protection response and services by using the following principles of crime prevention through environmental design (CPTED):

- Delineate private and public spaces
- Enhance visibility
- Control property access
- Ensure adequate property maintenance

**Action SAF-1.2B**

Pursue public art projects that match the culture of the neighborhood to create a sense of ownership and belonging.

**Action SAF-1.2C**

Engage residents and business owners in ongoing discussions about how land use and planning



decisions can help to reduce violence.

**Action SAF-1.2D**

Incentivize a variety of uses in a neighborhood that will be active throughout the day and night.

**POLICY SAF-1.3**

**Ensure that City-managed spaces and facilities support a feeling of safety for users.**

**Action SAF-1.3A**

Design and maintain parks, waterways, trail corridors, and other facilities to meet the recreational needs of the community, while maximizing public safety and access concerns, such as through the following approaches:

- Locate facilities to ensure visibility along public roadways where appropriate.
- Provide clear access points.
- Maintain vegetation to maximize visibility and demonstrate active attention to the site.
- Use signage to clearly convey site ownership and rules.

**Action SAF-1.3B**

Design and improve City streetscapes to create safer places by maximizing visibility through installation and maintenance of appropriate lighting and landscaping.

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## GOAL SAF-2: HAZARD PROTECTION

Protect residents and businesses from natural and human-caused hazards.

### WE NEED TO BE PREPARED FOR EMERGENCIES

The Hazard Protection section contains the City's policies and actions to minimize hazardous situations in and around Stockton. It identifies the natural and human-caused hazards that affect existing and future development, describes present and expected future conditions, and sets policies and standards for improved public safety. This includes efforts to minimize physical harm to the buildings and infrastructure in and around Stockton to reduce damage to local economic systems, community services, and ecosystems. Much more detail about this section and the issues it addresses are included in the Safety Element Background Report.

### CLIMATE CHANGE VULNERABILITY

Changes to the global climate system are expected to affect future occurrences of natural hazards in and around Stockton. Many hazards are projected to become more frequent and intense in coming years and decades, and in some cases, these changes have already begun. Key effects of climate change that affect Stockton include increasing temperatures, changes in precipitation, and sea level rise. Overall, precipitation levels are expected to increase only slightly. However, but there are likely to be more years of extreme precipitation events and as well as droughts that last longer and are more severe.

Under California law, the Safety Element is required to include a vulnerability assessment that looks at how people, buildings, infrastructure, and other key community assets may be affected by

climate change. The City ~~conducted~~ prepared a Climate Change Vulnerability Assessment in the winter of 2023 to analyze Stockton's susceptibility to climate-related hazards. ~~prepared in accordance with~~ The assessment followed the most recent available guidance in the *California Adaptation Planning Guide*.

The Climate Change Vulnerability Assessment found that inland flooding and sea level rise poses the greatest threat to Stockton, followed by extreme heat, severe weather, wildfire and smoke, and human health hazards. The most vulnerable communities include low-resourced people of color, outdoor workers, and individuals experiencing homelessness, although but many other groups also face an increased risk of harm. Many local and regional infrastructure networks are vulnerable, including the electrical grid, transportation systems, flood control systems, and water and wastewater infrastructure. Damage to these systems can create serious public health hazards and cause widespread economic harm. The Safety Element includes goals, policies, and implementation actions to increase community resilience and help lower vulnerability.

### COMMUNITY WARNING SYSTEMS

San Joaquin County has partnered with Everbridge, a public warning platform, to implement SJREADY, a community notification system to alert residents about emergency events and other important public safety information. This system allows San Joaquin County to provide Stockton residents with critical information quickly in an emergency. There are also several other emergency alert systems, including notifications through broadcasters, cable television systems,



and digital audio services. Social media and websites can supplement these alert systems.

## **EMERGENCY EVACUATION**

With advanced warning, evacuation can be effective in reducing injury and loss of life during a catastrophic event. The San Joaquin County Office of Emergency Services has prepared an evacuation plan for response to flooding due to failure of a levee or dike. The evacuation plan includes routes for people evacuating by car, rally points for people needing assistance evacuating, and instructions for how to evacuate safely during a flood.

Figure 5-2 shows potential major evacuation routes in Stockton, including highways and surface streets. If there is a need for an evacuation, emergency responders will direct community members to the most suitable evacuation routes given for the specific needs and characteristics of the emergency. This figure also shows residential parcels that are at least half a mile from a major roadway and with limited access points. These parcels may face evacuation constraints, creating potential difficulties if there is a need to evacuate.

Stockton has prepared an analysis of potential evacuation times for different areas of the city under different emergency situations: a city-wide evacuation due to a 500-year flood event that results in levee breaches, a major dam break, and a smaller-scale flood event exacerbated by sea level rise. In each scenario, the City identified the paths out of Stockton (referred to as or "evacuation gateways") that would remain viable and would not lead into another hazard zone, and then estimated the amount of time it would take residents to reach one of these gateways under either normal driving speeds or a constrained 5 miles per hour.

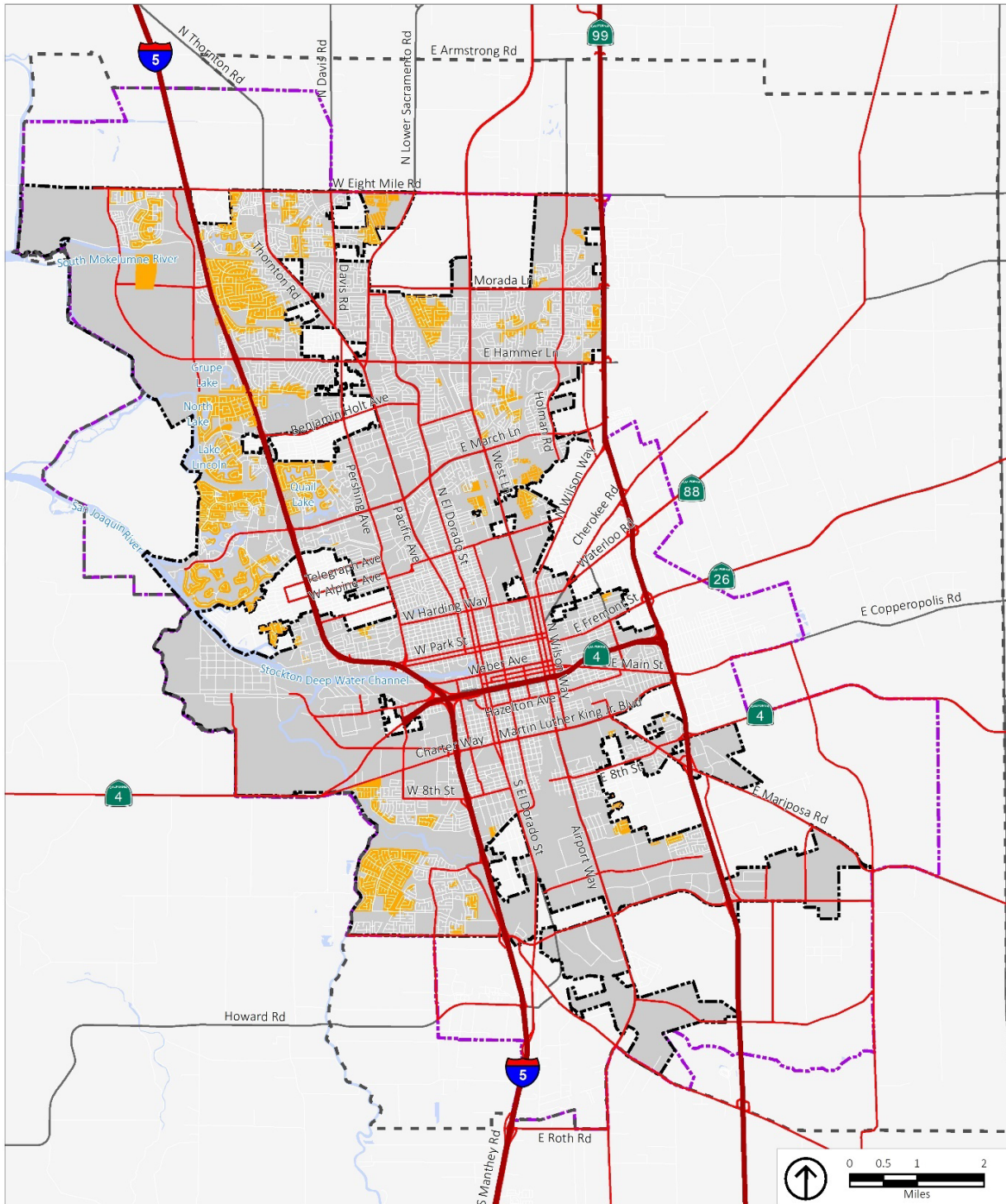
If normal driving speeds remain feasible, this modeling shows that most of Stockton could be evacuated in approximately 30 minutes, although areas in northwest Stockton could take longer

since the most viable evacuation routes lead toward the southeast. Under constrained driving speeds, evacuation times are significantly longer, particularly for areas in northwest Stockton, such as the Spanos Park and Bear Creek neighborhoods. The full results of the evacuation scenario are presented in the Safety Element Background Report. The policies included in this Safety Element help address issues of evacuation constraints and similar challenges.







**Figure 5-2**

**Evacuation Routes and Residential Parcels with Evacuation Constraints**

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Source: City of Stockton; Fehr & Peers, 2016; PlaceWorks, 2023; ESRI 2019

-  General Plan Planning Area
-  City Limit
-  Sphere of Influence
-  Residential Parcel with Potential Evacuation Constraints
-  Possible Evacuation Route - Freeway
-  Possible Evacuation Route - Surface Street

**POLICY SAF-2.1**

~~Ensure that community members are adequately prepared for natural disasters and emergencies through education and training.~~

**Action SAF-2.1A**

~~Develop neighborhood watch and emergency support groups to be trained and put into action in the event of an emergency in support of government staff.~~

**Action SAF-2.1B**

~~Inform the public about the specific risks of living in flood-prone areas and provide residents with instructional information on how to take steps to reduce their exposure to flood damages.~~

**POLICY SAF-2.12**

**Prepare sufficiently for major events to enable quick and effective response.**

**Action SAF-2.12A**

~~Require new development to provide adequate access for emergency vehicles and evacuation routes, including by designing roadway systems to provide multiple escape routes in the event of flooding or other emergencies in the event of a levee failure.~~

**Action SAF-2.1B**

~~Regularly review the City's evacuation maps and update as necessary.~~

**Action SAF-2.1C**

~~Regularly share the City's evacuation maps with the public and property owners within flood zones.~~

**Action SAF-2.1D**

~~Coordinate with transit and service providers to identify and advertise ways for individuals with restricted mobility to evacuate in the event of a flood or other emergency.~~

**Action SAF-2.12EAB**

Formulate, review, periodically update, and make available to the public emergency management plans for the safe  evacuation of people from areas subject to environmental hazards ~~inundation from levee and dam failure.~~

**Action SAF-2.12FBC**

Require new critical facilities, including hospitals, emergency operations centers, communications facilities, fire stations, and police stations, to be located, designed, and constructed to avoid or mitigate potential risks and ensure functional operation during flood events. ~~—(i.e., a~~ Avoid locating critical facilities in the 100-year and 200-year floodplains or, within the 2085 projected sea level inundation zone, and construct facilities to be resilient to seismic and geological events, fires, and explosions.

~~the 100-year and 200-year floodplains or within the 2050 projected sea level inundation zone as shown in Figures XX), all~~

**Action SAF-2.12GCD**

Continue to work with San Joaquin County, the County Office of Emergency Services, other cities in the region, and disaster agencies to coordinate disaster and emergency preparedness planning.

**Action SAF-2.1D**

Ensure that emergency alerts and related notifications are widely distributed in multiple languages, formats, and media so as to effectively reach as many people as possible, including those with limited English proficiency and with access and functional needs.

**POLICY SAF-2.2**

**Enhance the effectiveness of evacuations in Stockton.**

**Action SAF-2.12A**

Require new development to provide adequate access for emergency vehicles and evacuation

routes, including by designing roadway systems to provide multiple escape routes in the event of flooding or other emergencies.

**Action SAF-2.12B**

Regularly review the City's evacuation maps and update as necessary.

**Action SAF-2.12C**

Regularly share the City's evacuation maps with the public and property owners within flood zones.

**Action SAF-2.12D** 

Coordinate with transit and service providers to identify and advertise ways to evacuate in the event of a flood or other emergency for individuals with restricted mobility or those who may need additional assistance to evacuate in the event of a flood or other emergency.

**Action SAF-2.12E**

In partnership with the San Joaquin Council of ~~Governments~~Governments and other local agencies, retrofit potential evacuation routes to protect them against floodwaters and other emergencies, and ensure that they can provide viable paths out of Stockton.

**Action SAF-2.12F** 

Conduct door-to-door evacuation notifications in areas with limited access to reliable communication, particularly in frontline communities or those that may need the greatest advanced notification.

**Action SAF-2.12G**

To the extent feasible ~~given~~in emergency conditions, phase evacuations to minimize roadway constraints and to allow all residents sufficient time to leave.

**POLICY SAF-2.23**

**Ensure that community members are adequately prepared for natural disasters and emergencies through education and training.**

**Action SAF-2.23A**

Develop neighborhood watch and emergency support groups to be trained and put into action in the event of an emergency in support of government staff in the event of an emergency.

**Action SAF-2.23B**

Conduct public education campaigns to increase awareness of and preparation for climate hazards.

## **SEISMIC AND GEOLOGIC HAZARDS**

Seismic and geologic hazards are risks caused by the movement of the Earth's surface, or crust. Seismic hazards are earthquakes and related hazards. Geologic hazards are other hazards involving land movements that are not linked to seismic activity.

There are a few faults in the region capable of causing a major earthquake in Stockton, ~~although but they are all of these faults sit~~ west of Stockton, closer to the San Francisco Bay. ~~Smaller faults sit~~ Closer to Stockton are some smaller faults, including the Stockton Fault ~~which that~~ runs east-west across the city, but it is not known to be active. Strong shaking from a major earthquake is rare in Stockton, although there were reports of significant shaking and localized damage in the area during the 1989 Loma Prieta earthquake. Figure 5-3 shows key fault lines in the region, ~~although but~~ not all smaller or less active faults are shown.

If major shaking from an earthquake does occur in Stockton, there is a risk of significant injury or loss of life from the damage or collapse of buildings and structures. Older homes in particular are at risk, ~~as because~~ they were constructed ~~prior to the advent of~~ before modern buildings codes and may not be seismically retrofitted. There is also a risk of harm from secondary hazards caused by the shaking, including urban fires, dam failures, and toxic chemical releases.

Other geologic hazards ~~that~~ may occur in the area, ~~includinge~~ landslides, subsidence (the gradual sinking of land, often due to groundwater pumping), and soils that can significantly expand and contract depending on their moisture levels. There are no areas of substantial landslide risk in Stockton. Other parts of the Delta region have experienced subsidence, and there is an increased risk of further subsidence due to water management practices. Most of Stockton sits on areas with a moderate risk of soil expansion. Any construction on these soils may require

certain specific management practices to reduce potential damage.


### **POLICY SAF-2.54**

**Reduce the potential harm from earthquakes and geologic hazards.**

#### **Action SAF-2.54A**

Participate in local, county, and State-sponsored earthquake preparedness programs.

#### **Action SAF-2.54B**

Coordinate with the Stockton Fire Department, Stockton Community Emergency Response Team, San Joaquin County Office of Emergency Services, special districts, local utility providers, and major businesses to ensure effective preparation, response, and recovery services are available throughout the community before, during, and after  seismic event.

#### **Action SAF-2.54C**

Assess critical and lifeline facilities for seismic and landslide safety to ensure they remain operational after a seismic event or landslide.

#### **Action SAF-2.54D**

Identify City infrastructure with seismic or landslide vulnerabilities and pursue funding to conduct appropriate seismic retrofits.

#### **Action SAF-2.54E**

Continue to implement California Building Standards Code seismic safety standards for construction of new buildings.

#### **Action SAF-2.54F**

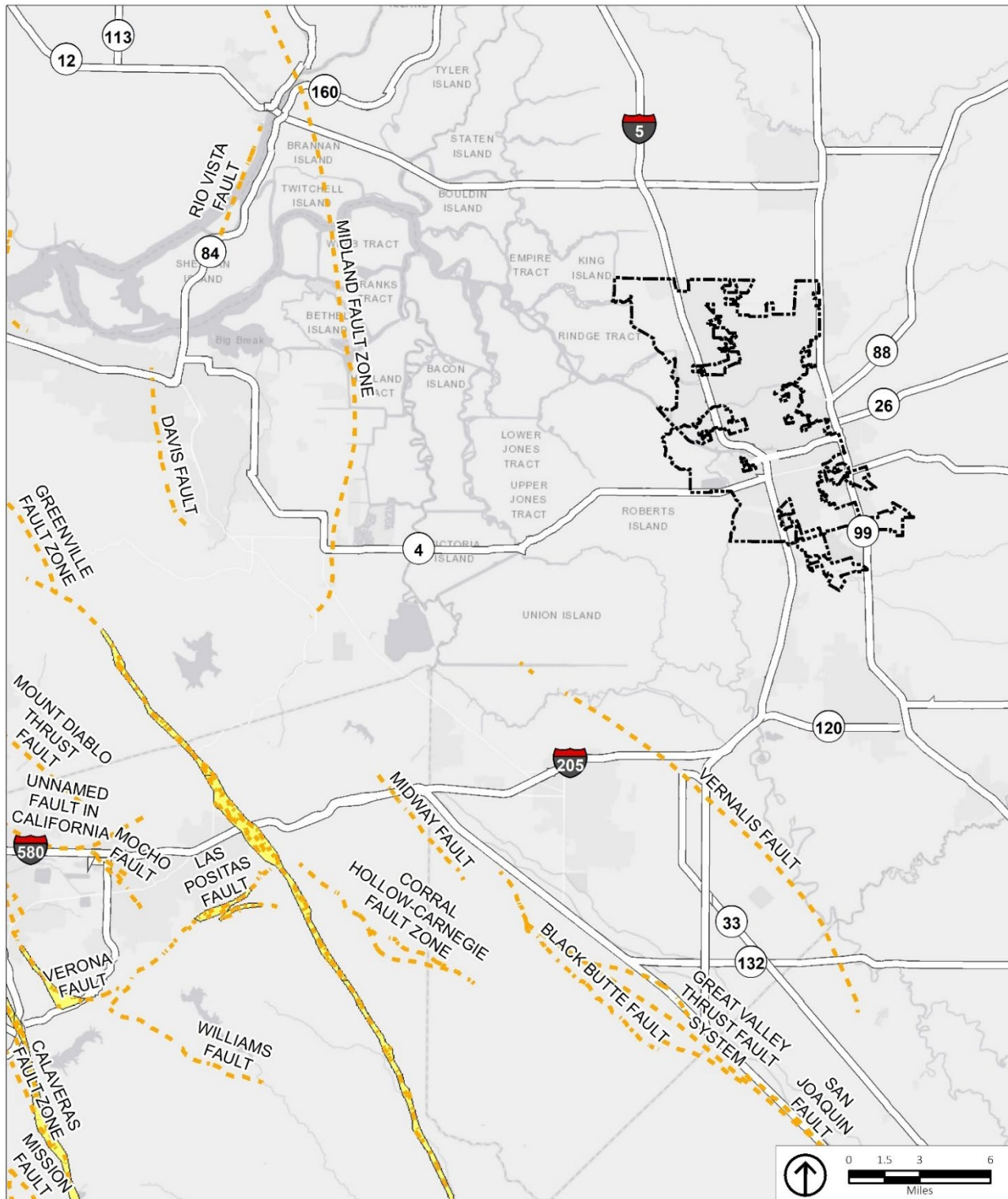
Target low-income households, owners and occupants of structures constructed prior to 1980, and owners and occupants of unreinforced masonry buildings with information regarding the importance of seismic retrofitting, and help building owners and occupants connect with providers of these services

**Action SAF-2.54G**

Locate new critical and lifeline facilities outside of landslide susceptibility areas, when feasible. If not feasible, appropriately site, design, and construct new critical facilities to be resilient to landslides.

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Figure 5-3  
Regional Fault Lines



Source: City of Stockton; Fehr & Peers, 2016; PlaceWorks, 2023, USGS 2010/2021

- City Boundary Line
- USGS Regional Fault Lines
- Alquist Priolo Fault Zones



## **FLOODING AND INUNDATION**

### **HAZARDS**

Floods are among the costliest natural disasters in terms of human hardship and economic loss nationwide, significantly threatening people's health and lives and causing substantial damage to structures, landscapes, and utilities. Reclamation of Delta land over many years has reduced available floodplain and increased flooding potential. Flood risk is therefore one of the most pressing threats to the Delta area, and Stockton is one of the areas at highest risk.

Areas at an elevated risk of flooding are generally divided into 100-, 200-, and 500-year flood zones. A 100-year flood zone has a 1 percent chance of experiencing a major flood in any given year, a 200-year flood zone has a 0.5 percent chance, and a 500-year flood zone has a 0.2 percent chance. The majority of the city is in one of these flood zones, as shown on Figure 5-4, making flooding a hazard of significant concern for Stockton. Figure 5-5 shows the land uses in these affected areas.

Most of the city is protected from flooding by levees, which are shown on Figure 5-6. However, many levees in the Delta region were initially constructed more than a century ago using rudimentary equipment and nonengineered fill material excavated from adjacent channels, sloughs, and marshes. There have been several improvements to the levee system in and around Stockton in recent years, including construction of new flood protection facilities led by the San Joaquin Area Flood Control Agency. A number of local, regional, state, and federal agencies play a role in maintaining levees and other flood protection facilities in and around Stockton. This includes the Central Valley Flood Protection Board, a regulating authority over flood risk management in the Central Valley and responsible for adopting the Central Valley Flood Protection Plan.

Despite these improvements, vulnerabilities remain in Stockton's levee system. The Country Club neighborhood and areas along the San Joaquin River and its floodplain within the southern part of the city do not receive adequate flood protection from levees. Although all remaining levees provide 100-year flood protection, no levees meet the State's 200-year flood protection requirement in the [Central Valley Flood Protection Plan](#)<sup>CVFPP</sup>. The Delta's levees are also threatened by the active seismic zones west of the Delta, including the San Andreas and Hayward faults. Even without an earthquake or flood, Delta levees can fail during high tides or even on sunny days. In the event of a major levee break, much of the city would be inundated, potentially damaging tens of thousands of homes.

### **Sea Level Rise**

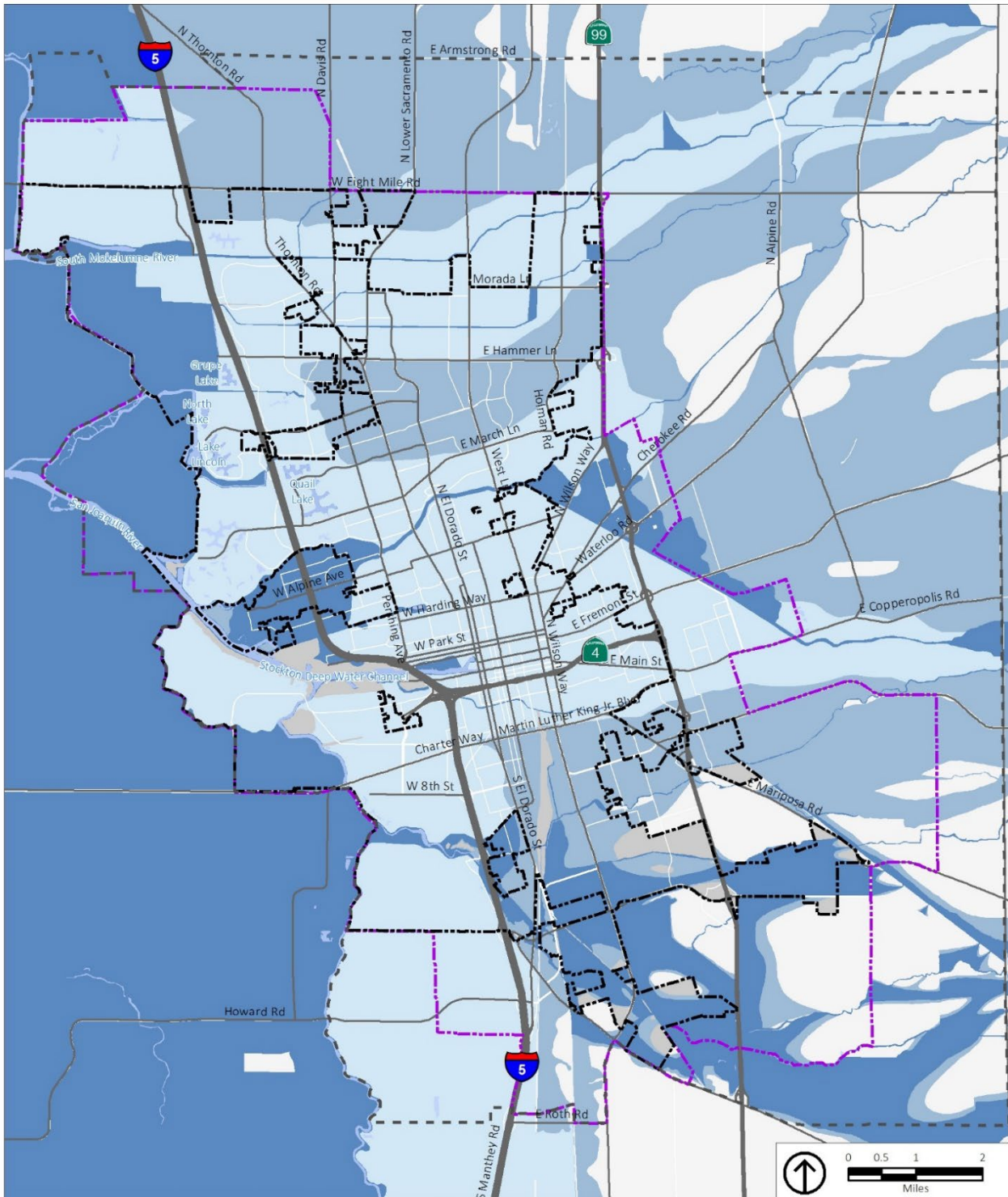
Sea level rise is an increase in the ocean's surface height relative to the land in a particular location. It is a gradual process that takes place over years or decades, affecting communities near shorelines and low-lying waterways, including the Sacramento/San Joaquin Delta region. Sea levels in the San Francisco Bay-Delta Estuary are likely to rise at least to 7 to 13 inches by 2050, and potentially as high as 23 inches (almost two feet). By the end of the century, sea levels are likely to rise significantly higher, potentially as much as ~~about~~ 7 to 10 feet. Figures 5-7 and 5-8 show the likelihood that certain areas of Stockton will be flooded due to sea level rise by 2050 and 2085, respectively.

There are a range of factors that impact water levels in the San Joaquin Delta, including inflows (from local and upstream precipitation), San Joaquin Delta exports [into regional and state water systems](#), astronomical tides, atmospheric effects (pressure and wind), and flow control operations. Regional and local land subsidence further complicates local sea level trends for the Delta region. Decomposition of drained and converted marsh and peat soils within diked Delta islands have caused much of the Delta region to lie below sea level—in some places by as much as

15 to 20 feet. Continued land subsidence may increase the relative rate of locally observed sea level change for the Delta area when comparing water levels to local land elevations.

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Figure 5-4  
**Flood Hazard and Levee Protection Zones**



Source: City of Stockton; San Joaquin County; Federal Emergency Management System (FEMA), 2016; PlaceWorks, 2017.

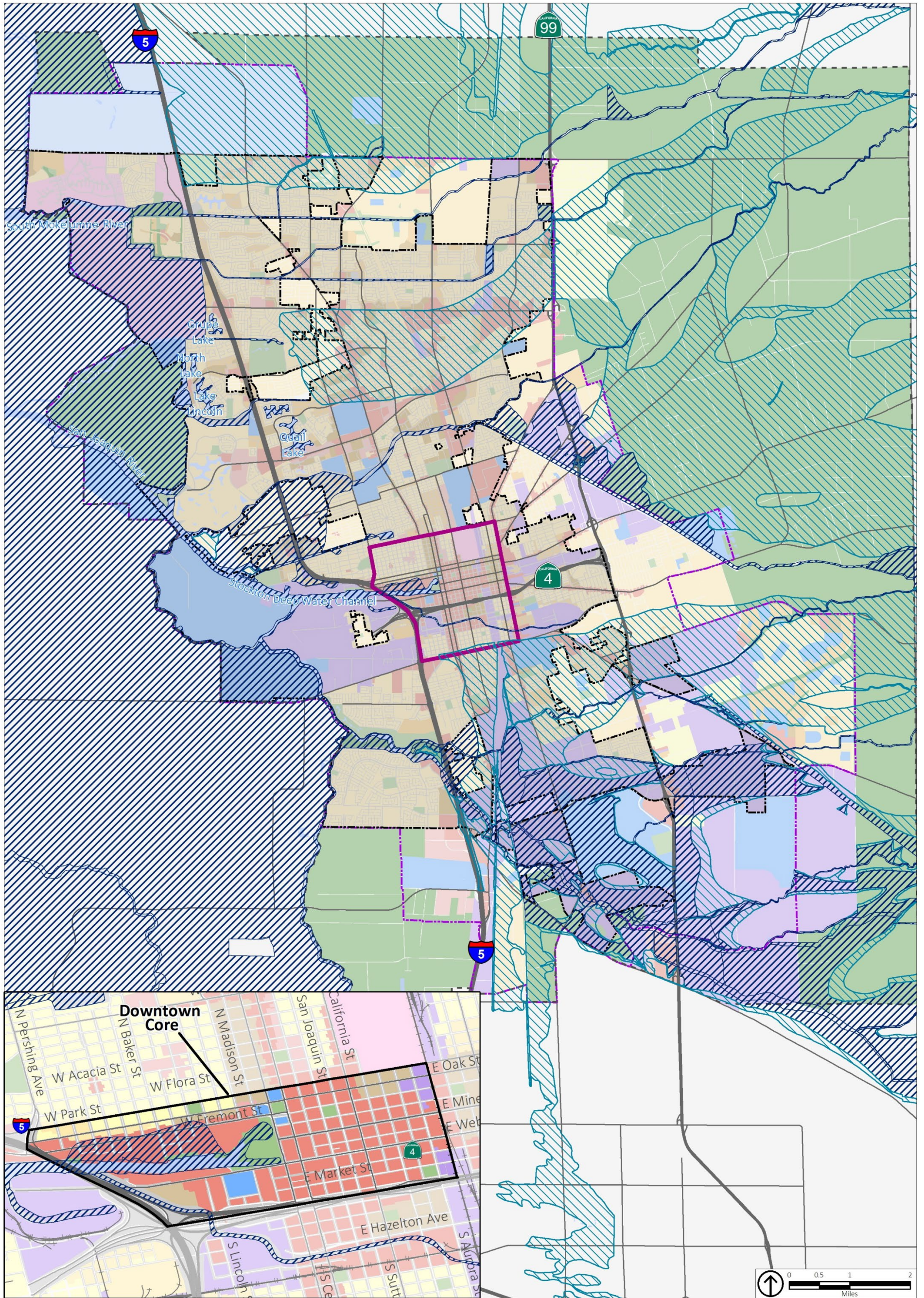
- |                      |                            |
|----------------------|----------------------------|
| <b>Flood Zones</b>   | City Limit                 |
| 100-Year Flood Zone  | Sphere of Influence        |
| 500-Year Flood Zone  | General Plan Planning Area |
| Protected by a Levee |                            |

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**Figure 5-65**

**Planned Land Uses in Flood Hazard Zones**



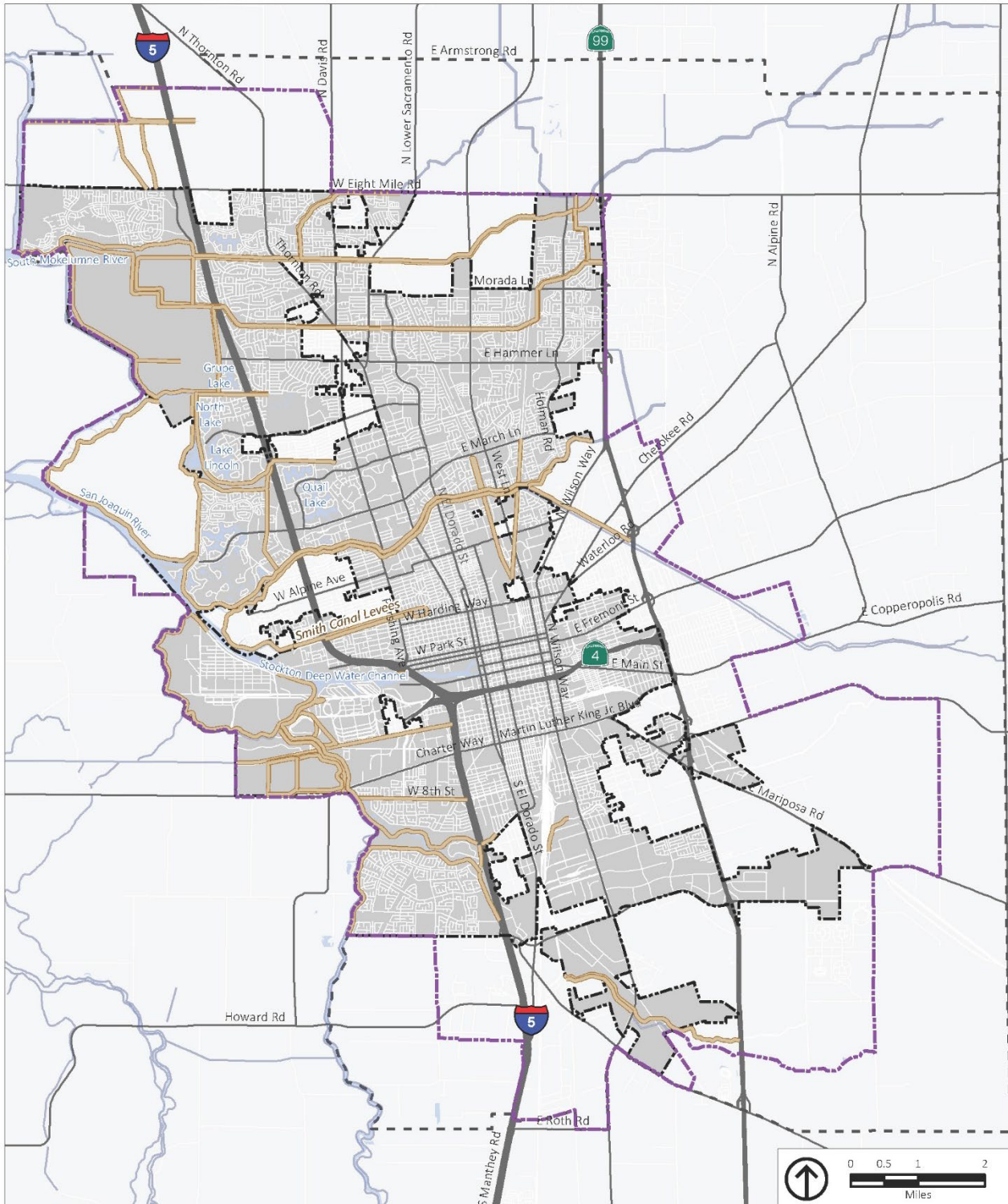
Source: Federal Emergency Management Agency, 2016; City of Stockton, 2017; PlaceWorks, 2017.

- |                     |                            |                            |                             |                                   |
|---------------------|----------------------------|----------------------------|-----------------------------|-----------------------------------|
| <b>Flood Zones</b>  | City Limit                 | Residential Estate         | Mixed Use                   | Economic and Education Enterprise |
| 100-Year Flood Zone | Sphere of Influence        | Low Density Residential    | Commercial                  | Institutional                     |
| 500-Year Flood Zone | General Plan Planning Area | Medium Density Residential | Administrative Professional | Parks and Recreation              |
|                     | Greater Downtown Boundary  | High Density Residential   | Industrial                  | Open Space/Agriculture            |

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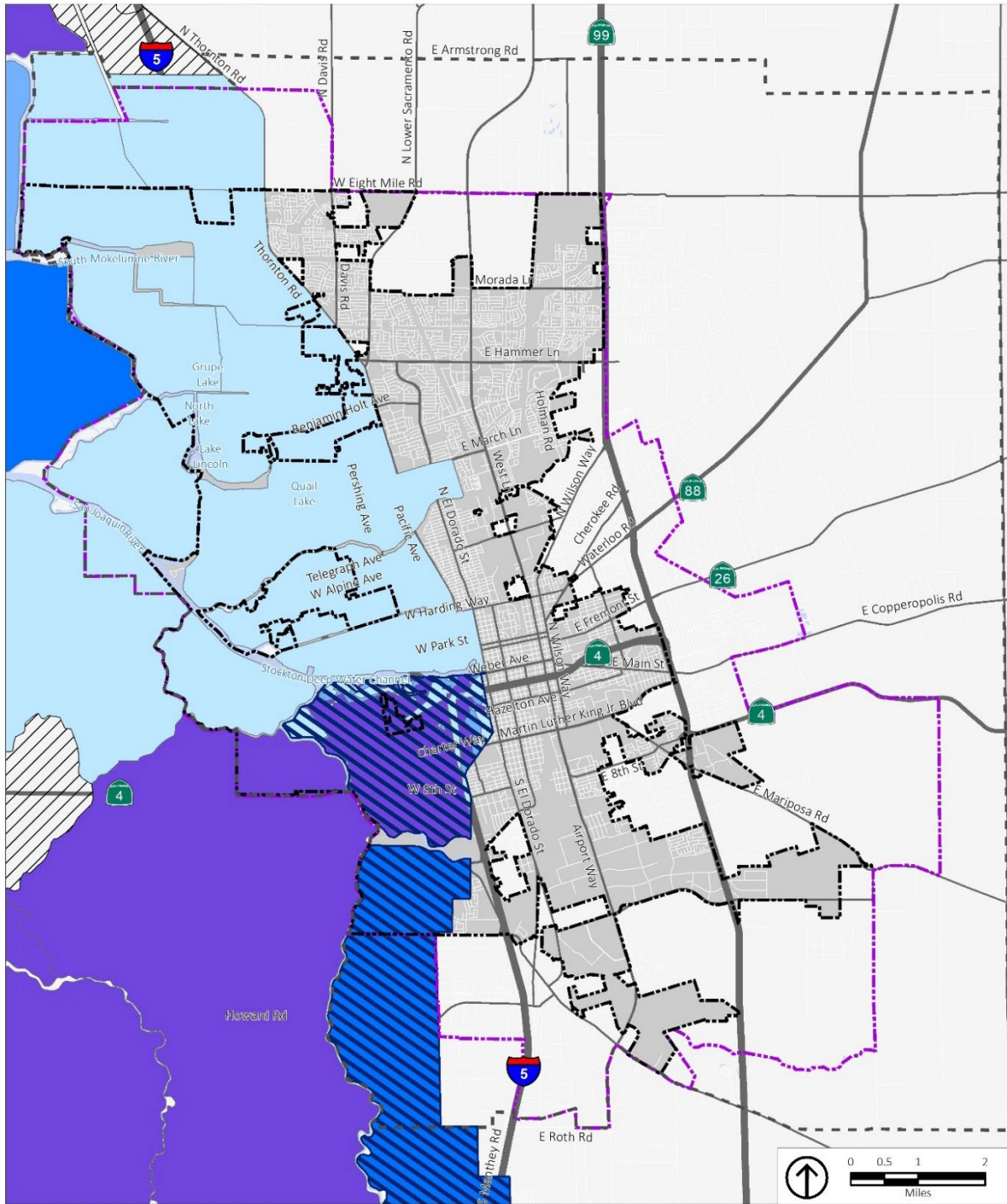
Figure 5-6  
**Flood Protection Levels**



Source: Federal Emergency Management System (FEMA), 2017; PlaceWorks, 2017.

- Levees
- City Limit
- Sphere of Influence/ EIR Study Area
- General Plan Planning Area

Figure 5-7  
**2050 Sea Level Rise Projections (Probabilistic)**



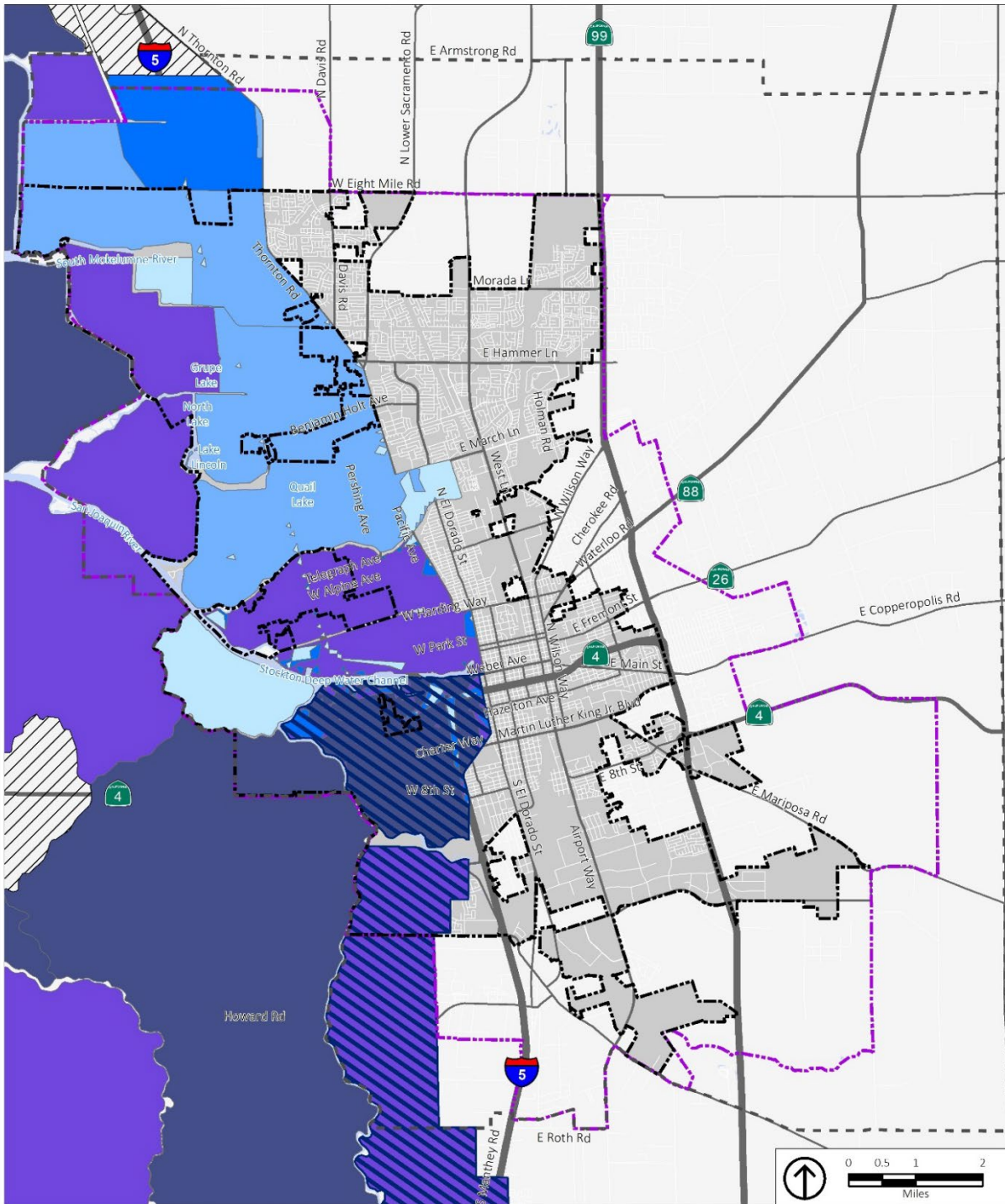
Source: City of Stockton; Fehr & Peers, 2016; PlaceWorks, 2023; ESRI 2019, Delta Stewardship Council 2021

**Flood Hazard for 2050 Probabilistic Conditions**

<ul style="list-style-type: none"> <li> General Plan Planning Area</li> <li> City Limit</li> <li> Sphere of Influence</li> <li> Not Modeled</li> <li> High Risk of River Flooding</li> </ul>	<i>Annual Chance</i>	<i>Return Period</i>	<i>Chance over 10 years</i>
	10%	Less than 10 years	Greater than 65%
	2-10%	10 to 50 years	18% to 65%
	1-2%	50 to 100 years	10% to 18%
	.5-1%	100 to 200 years	5% to 10%
	<.5%	Greater than 200 years	Less than 5%



Figure 5-8  
**2085 Sea Level Rise Projections (Probabilistic)**



Source: City of Stockton; Fehr & Peers, 2016; PlaceWorks, 2023; ESRI 2019, Delta Stewardship Council 2021

**Flood Hazard for 2085 Probabilistic Conditions**

- General Plan Planning Area
- City Limit
- Sphere of Influence
- Not Modeled
- High Risk of River Flooding

<i>Annual Chance</i>	<i>Return Period</i>	<i>Chance over 10 years</i>
10%	Less than 10 years	Greater than 65%
2-10%	10 to 50 years	18% to 65%
1-2%	50 to 100 years	10% to 18%
.5-1%	100 to 200 years	5% to 10%
<.5%	Greater than 200 years	Less than 5%

### **Dam Failure**

A dam failure is an uncontrolled release of water from a reservoir through a dam because of structural failures or deficiencies in the dam, usually associated with intense rainfall or prolonged flooding. Dam failures can range from minor to catastrophic. Although dam failures are very rare, they are not unprecedented. There are four major causes of dam failures: overtopping (when water levels in a reservoir rise above the top of the dam), foundation defects in the dam structure, piping and seepage failure in the dam or surrounding rock, and conduit and valve failure.

Stockton is within the inundation areas of four major dams: the New Hogan Dam on the Calaveras River, the New Melones Dam on the Stanislaus River, the Camanche Dam on the Mokelumne River, and the Don Pedro Dam across the Tuolumne River at the Don Pedro Reservoir. Failure of any of these dams would give residents about seven hours to evacuate. Other major regional dams could also affect Stockton, but would have longer warning times. Figure 5-89 shows the dam hazard areas in Stockton.

### **Likelihood of Future Flooding**

The city's proximity to the Delta, relatively low elevation, and potential to experience heavy rains mean that flood will continue to pose a significant hazard to the community. Climate change is expected to increase the frequency and intensity of strong storms that are more likely to create flooding. Sea level rise is expected to exacerbate this risk by increasing the height of the water surface in the Delta, including expanding the parts of the city that are considered prone to flood. By 2050, an addition 29,550 residents of Stockton are expected to be exposed to flooding, and 55,690 by the end of the century.

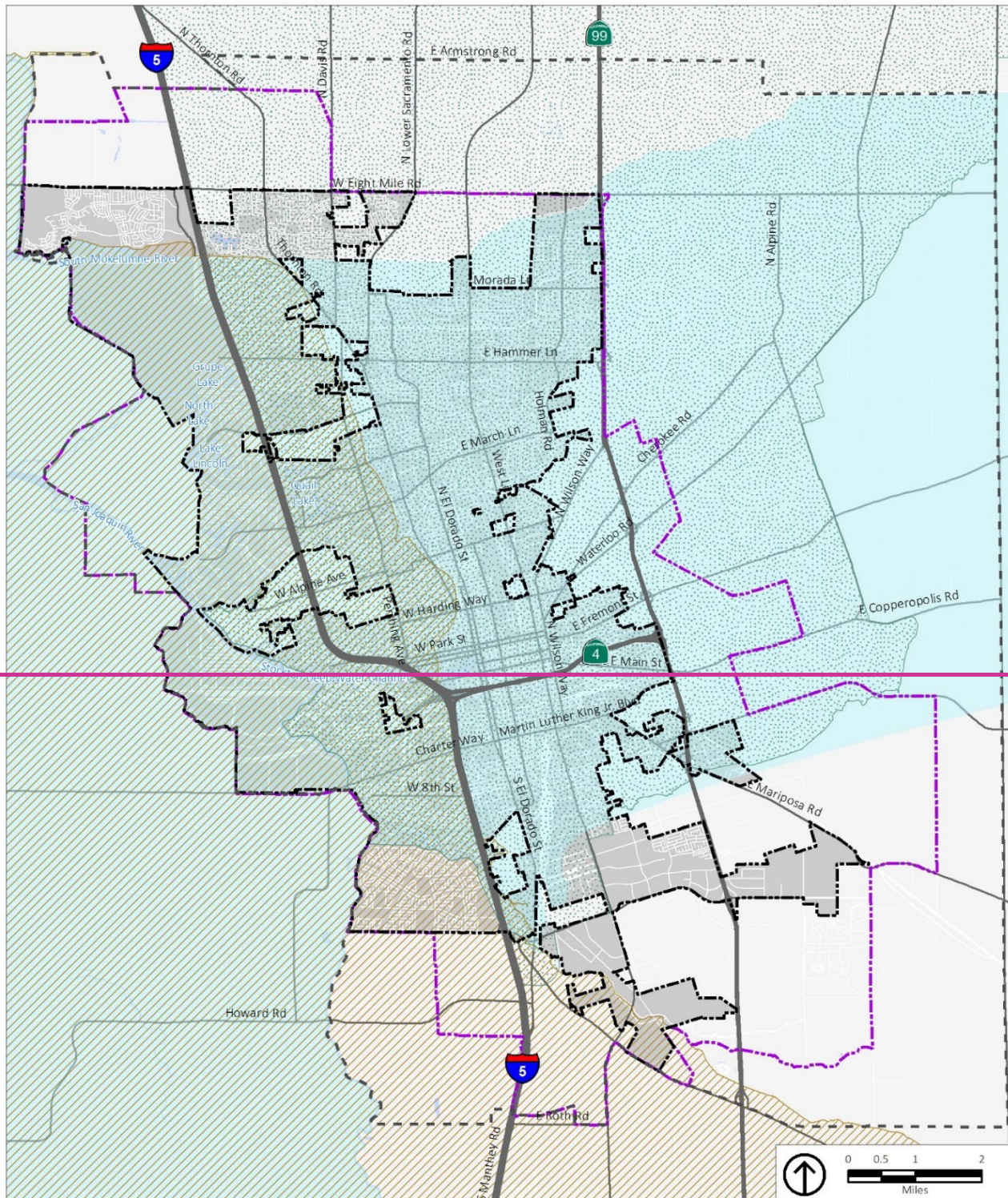
Increased frequency and severity of Delta flooding could have significant impacts on some of Stockton's most vulnerable residents. Approximately 65 percent of the Delta's

population that could be exposed to the 100-year flood by 2050 reside in areas with high concentrations of socially vulnerable residents. Increases in damaging flood events will cause greater property damage, public health and safety concerns, displacement, and loss of life.

As sea levels rise and heavy precipitation becomes more common, the likelihood of levee overtopping will increase. Levee breaks could cause large amounts of salt water from the Bay to enter the Delta and would have an adverse effect on Delta water quality and water system operations. Salt water intrusion could take months to dissipate, depending on the severity of the levee break and the degree of intrusion.

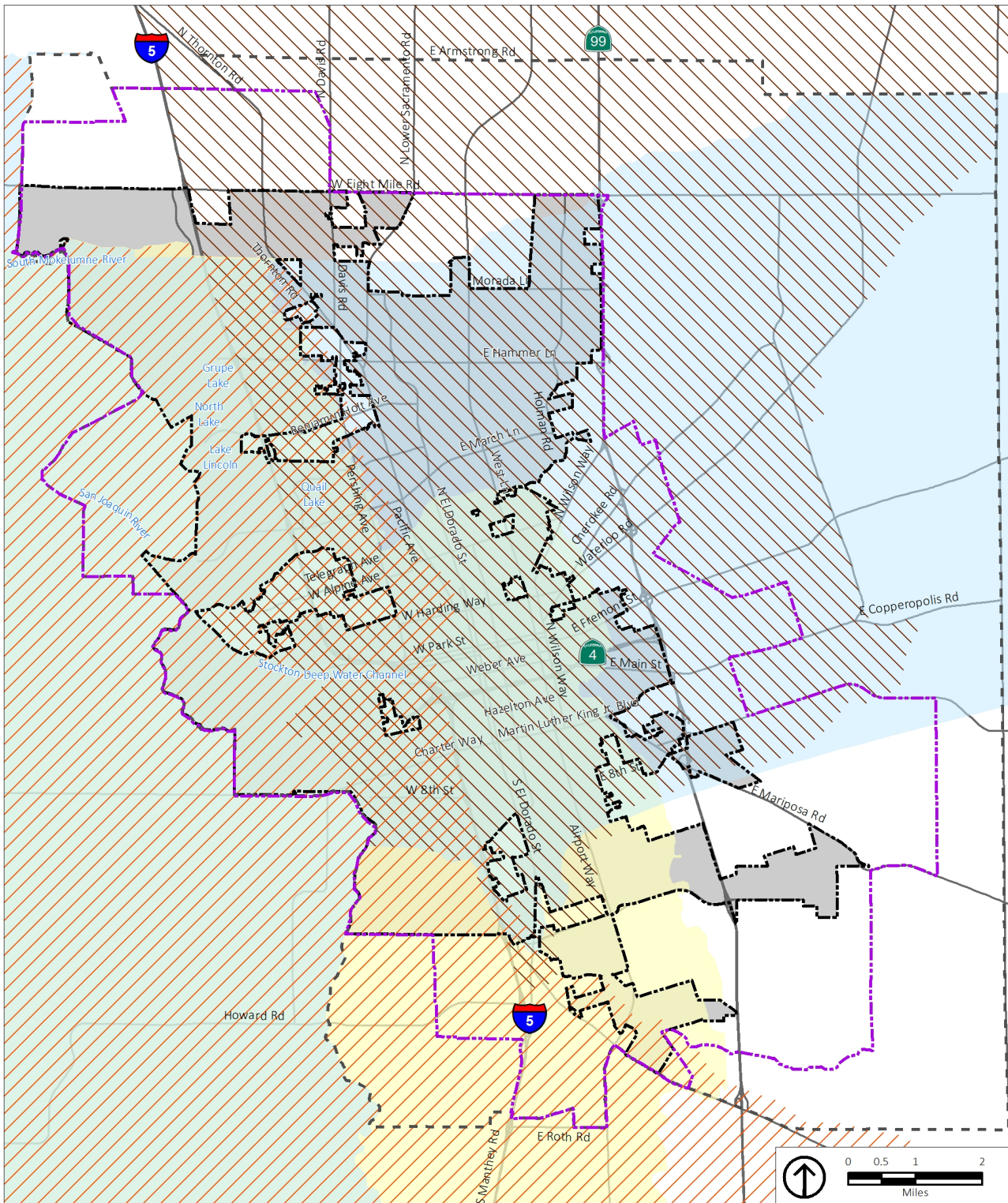
Of the ecosystems currently protected by levees in the Delta region, 73 percent are at risk of flooding due to levee overtopping resulting from a combination of sea level rise and storm events. By 2085, rising sea levels are expected to cause all critical remaining tidal wetland ecosystems in the Delta to transition to different plant communities or drown completely.

Figure 5-9  
**Dam Inundation**










Source: San Joaquin County, 2017; PlaceWorks, 2017.

- |                             |                            |
|-----------------------------|----------------------------|
| <b>Dam Inundation Areas</b> | City Limit                 |
| Camanche Dam                | Sphere of Influence        |
| New Melones Dam             | General Plan Planning Area |
| New Hogan Dam               |                            |



Source: San Joaquin County, 2017; PlaceWorks, 2023; DWR, 2023 .

**Dam Inundation Areas**

-  Camanche Dam
-  New Melones Dam
-  New Hogan Dam
-  Don Pedro Reservoir
-  City Limit
-  Sphere of Influence/ EIR Study Area
-  General Plan Planning Area

**POLICY SAF-2.35****Protect the community from potential flood events.****Action SAF-2.3A5A**

Coordinate with appropriate State, federal, and local flood control agencies to develop a flood protection plan for the levee systems protecting the city that:

- Identifies the levees protecting the city and the entities responsible for the operation and maintenance of the levees.
- Determines the flood levels in the waterways and the level of protection offered by the existing levees along the waterways.
- Identifies a long-term plan to upgrade the system as necessary to provide at least a 100-year level of flood protection to the city, and 200-year level of flood protection, where feasible.
- Encourages multi-purpose flood management projects that, where feasible, incorporate recreation, resource conservation, preservation of natural riparian habitat, and scenic values of the city's streams, creeks, and lakes.
- Includes provisions for updates to reflect future State or federally mandated levels of flood protection.

**Action SAF-2.3B5B**

Collaborate with State and local flood management agencies and other interested parties to develop funding mechanisms to finance the local share of flood management responsibilities and maintain cooperative working relationships with appropriate agencies to minimize flood hazards and improve safety.

**Action SAF-2.3C5C**

Require new public and private waterfront development to be oriented to waterways and provide setbacks and easements along levees and channels to provide space for levee widening, flood fighting, roadway and

maintenance access, open space and trail amenities, and appropriate landscaping.

**Action SAF-2.35D**

For any critical public facility sited within the 100-year floodplains (as shown in Figure 5-4) or within the areas at risk of inundation from sea level rise by 2085 projected sea level (as shown in Figure 5-8) inundation zone as shown in Figures XX, the responsible agency or department shall implement site or building flood protection improvement methods to ensure operability and minimize damage.

**Action SAF-2.3D**

**Prepare and maintain a map of evacuation routes for major flood events.**

**Action SAF-2.35E**

Work with residents experiencing insecure housing, with low incomes, with access and functional needs, and/or living in mapped flood hazard zones and levee protection areas (as identified in Figure XX5-4) to connect with local, regional, state, and federal initiatives to improve housing resiliency.

**Action SAF-2.3G5F**

Work with residents experiencing insecure housing, with low incomes, with access and functional needs, and/or living in mapped flood hazard zones and levee protection areas (as identified in Figure XX5-4) to insure their property and receive recovery resources in the aftermath of a flood.

**Action SAF-2.3H5G**

Work with residents experiencing insecure housing, with low incomes, with access and functional needs, and/or living in mapped flood hazard zones (as identified in Figure XX5-4) to obtain relocation assistance and/or obtain affordable housing outside of flood hazard zones.

☐

## Identify

### **POLICY SAF-2.46**

**Minimize risks to the community from flooding through appropriate siting and protection of structures and occupants.**

#### **Action SAF-2.4A6A**

Regulate new urban development in accordance with State requirements for 200-year level of flood protection and federal requirements for 100-year level of flood protection.

#### **Action SAF-2.46B**

Require flood-proofing of new and expanded buildings and structures in the mapped flood hazard zones and levee protection areas shown in Figure XX5-4. Flood-proofing methods will be determined on a project-by-project basis, and may include, but not be limited to:

- (a) Anchoring to prevent flotation, collapse, or lateral movement.
- (b) Using flood-resistant construction materials.
- (c) Employing construction methods and practices that minimize flood damage.
- (d) Elevating building pads and habitable building floors above the base flood elevation plus required freeboard.
- (e) Providing adequate venting to allow for equalization of hydrostatic flood forces.

#### **Action SAF-2.4C6B**

Investigate and implement when feasible mitigation measures that offer 200-year level of flood protection for existing urban development in flood-prone areas.

#### **Action SAF-2.4D6C**

**Preserve floodways and floodplains for non-urban uses to maintain existing flood carrying**

**capacities, except when mitigated in conformance with the City's floodplain management program.**

#### **Action SAF-2.4E6D**

Consider the best available flood and sea-level hazard information and mapping from regional, State, and federal agencies to inform land use and public facilities investment decisions.

## **OTHER HAZARDS OF CONCERN**

### **Drought**

A drought is an extended period when precipitation levels are well below normal and but is a normal part of the climate cycle. Drought may cause losses to agriculture; affect domestic water supply, energy production, public health, and wildlife; or contribute to wildfire. Like most of California and the western United States, Stockton chronically experiences drought cycles.

Drought impacts the city's water supply, which and, in severe instances, ultimately makes less water available for people, businesses, and natural systems. Both the City of Stockton Municipal Utilities District (COSMUD) and the California Water Service Company Stockton District (Cal Water) supply water to different parts of the community. Stockton's primary water sources during base years are surface water from several local and regional rivers (including the Calaveras, Stanislaus, and San Joaquin Rivers) and the East San Joaquin Subbasin of the San Joaquin Valley Groundwater Basin. As of August 2023, Stockton and the location of its water sources were not in drought conditions, although San Joaquin County was in a state of extreme to exceptional drought—the highest level of drought recognized by the US Drought Monitor—as recently as December 2022. COSMUD The City Utilities District and Cal-California Water both project that they will have an adequate water supply through 2045 for normal years, single dry years, and multiple dry years—water supply conditions.

Although droughts are a regular feature of California's climate, scientists expect that climate change will lead to more frequent and intense droughts statewide. Climate change is expected to cause more precipitation to fall as rain instead of snow, and the snow that does fall will melt earlier, reducing the Sierra Nevada spring snowpack by as much as 70 to 90 percent. How much snowpack will be lost depends in part on future precipitation patterns, the projections for which remain uncertain. However, even under wetter climate projections, the loss of snowpack would pose potential water shortage issues and exacerbate drought conditions.

Increasing frequency and severity of droughts will likely have negative impacts on Delta agriculture. Drought, especially in combination with other climate change stressors and hazards, such as extreme heat, may reduce crop productivity. Reductions in agricultural productivity would disproportionately impact low-income agricultural laborers, who would be more likely to lose their jobs first and who tend to have fewer resources to cope with drought and other climate change impacts. Drought and other climate change impacts may exacerbate existing water affordability issues. Increased frequency of droughts may also contribute to harmful algal blooms and degrade raw water quality, requiring drinking water treatment system upgrades.

### **Fire Hazards**

Fire hazards include both wildfires and urban fires. Though the city is vulnerable to both kinds of fire threats, the climatic and vegetative conditions in Stockton are generally not conducive to the spread or development of wildfires. Fuel, weather, and topography are primary factors that affect how wildland fires spread. Wildfire risk in San Joaquin County is generally low. Fire protection in Stockton is provided by the SFD, as described in Section 2.1, Public Safety.

CAL FIRE (California Department of Forestry and Fire Protection) establishes fire hazard severity zones (FHSZ), designating each as moderate,

high, or very high severity. There are no FHSZs in or immediately next to the city. However, there are high and very high FHSZs in neighboring counties, and smoke from fires in these areas could impact local air quality.

The wildland-urban interface (WUI) is an area where buildings and infrastructure (e.g., cell towers, schools, water supply facilities) mix with areas of flammable wildland vegetation. There are two types of WUI: interface (areas where housing and other development borders wildland areas) and intermix (where development is mingled and interspersed with wildland areas). Additionally, the influence zone refers to an area made up of wildfire-susceptible vegetation up to 1.5 miles from the WUI, and the threat zone is an additional strip of vegetation modified to reduce flame heights and radiant heat. Figure 5-10 shows the WUI zones around Stockton.

Although the wildfire risk in Stockton is low, there is a risk of structural fires. Structural fires are often due to faulty wiring or mechanical equipment and combustible construction materials. The absence of fire alarms and fire sprinkler systems are often conditions that exacerbate the damages associated with a structural fire. Structural fires are largely from human accidents, although some fires may be started deliberately (arson). Older buildings that lack modern fire safety features may face greater risk of damage from fires.

Greater frequency of regional fires can create recurrent air quality degradation, leading to respiratory health effects. Wildfire smoke consists of a mix of gases and fine particulate matter from burning vegetation and materials. The pollutant of most concern from wildfire smoke is fine particulate matter (PM<sub>2.5</sub>). PM<sub>2.5</sub> from wildfire smoke is damaging to human health due to its ability to deeply penetrate lung tissue and affect the heart and circulatory system. Although wildfire smoke presents a health risk to everyone, sensitive groups may experience more severe acute and chronic symptoms from exposure to wildfire smoke, such as children, older adults, people with

chronic respiratory or cardiovascular disease, or people experiencing low socioeconomic status. Air quality in Stockton has been impacted by major recent wildfires, most notably the Lightning Complex Fire of 2020, Creek Fire of 2020, and Camp Fire of 2018. All of these fires resulted in elevated levels of particulate matter in San Joaquin County for several days.

Warmer weather, reduced snowpack, and earlier snowmelt attributable to climate change are expected to increase wildfire risk due to increased fuel and ignition risks. Although Stockton itself faces a low wildfire risk, wildfire risk is generally projected to increase across Northern California, and wildfires are expected to become larger and harder to control, so Stockton will likely continue to be subject to wildfire smoke. Regional wildfires may also interfere with the city's power supply via Public Safety Power Shutoff events or damage to electricity transmission infrastructure.

### **Agricultural and Ecosystem Pests**

Though there is limited agricultural land and open space within Stockton itself, San Joaquin County contains significant farmland, including prime farmland and farmland of statewide importance, as well as extensive wetlands and levee systems. Therefore, the county is vulnerable to agricultural and ecosystem pests. Pests that have been of particular concern in San Joaquin County recently include nutria and Russian knapweed.

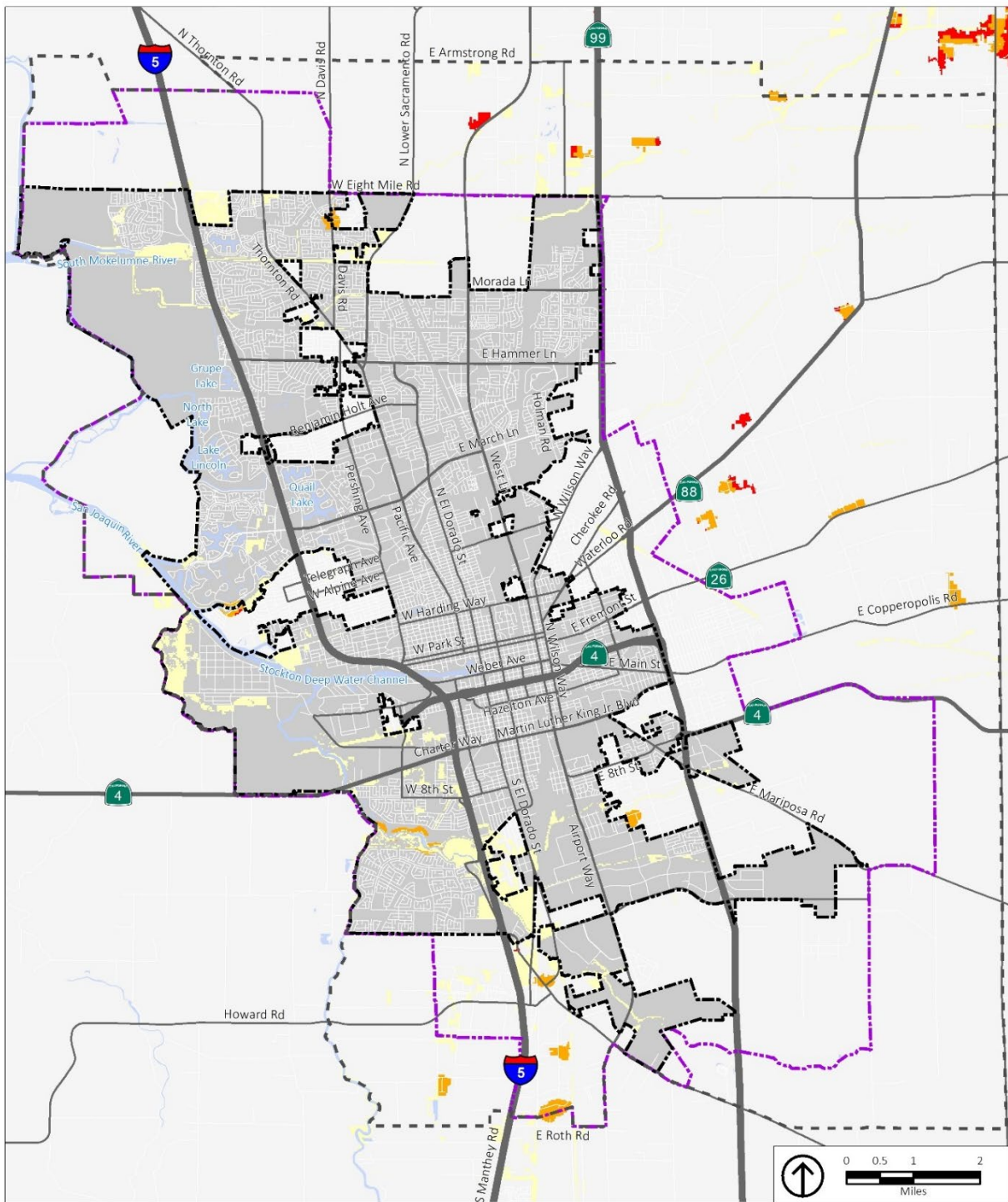
Agricultural and ecosystem pests will likely maintain a presence in San Joaquin County, though their activity can be at least partially managed via the County's pest-control initiatives. Pest activity is likely to increase because higher temperatures caused by global warming allow insects to reproduce more rapidly and increase the activity window for pests and diseases. Row crops can be affected by fungal pathogens and invasive disease vectors as temperatures continue to rise, affecting the quality and viability of crops.









FIGURE 5-10

Wildland-Urban Interface Zones

DRAFT



Source: City of Stockton; Fehr & Peers, 2016; PlaceWorks, 2023; ESRI 2019, CalFire 2015

-  General Plan Planning Area
-  City Limit
-  Sphere of Influence
-  Wildland/Urban Intermix Zone
-  Wildland/Urban Interface Zone
-  Wildland/Urban Influence Zone

### **Extreme Heat**

California's Cal-Adapt database of climate change effects defines extreme heat as temperatures that are hotter than 98 percent of the historical high temperatures for the area, as measured between April and October of 1961 to 1990. Days that reach this level are called extreme heat days. In Stockton, the extreme heat threshold is 102.3°F. An event with five extreme heat days in a row is called a heat wave. Extreme heat also takes the form of warm nights when temperatures do not cool down overnight to provide community members with relief from the hot days. This can also cause higher electricity use during the nighttime hours as community residents use more energy to cool homes. In Stockton, a warm night occurs when the temperature stays above 66°F.

Health impacts are the primary concern with this hazard, though economic impacts are also an issue. People exposed to extreme heat can suffer heat-related illnesses such as heat cramps, heat exhaustion, and (most severely) heat stroke. The elderly, individuals below the poverty level, outdoor workers, immigrant communities, and those experiencing homelessness are among the most vulnerable to extreme heat. Very high temperatures can harm plants, animals, and natural ecosystems that are not well adapted to them. The heat causes more demand for electricity (usually to run air conditioning units), and, in combination with the stress on the power lines, may lead to brownouts and blackouts.

Extreme heat tends to occur on an annual basis and is likely to continue occurring annually. According to California's climate change projections, the number of extreme heat days in Stockton is expected to rise from a historical annual average of 4 to 23 by the middle of the century (2035 to 2064) and 44 by the end of the century (2070 to 2099), with occasional years experiencing many more extreme heat days. The number of warm nights in Stockton is projected to increase from an annual average of 4 historically

to 27 by midcentury and 66 by the end of the century.

### **Severe Weather**

Severe weather is generally any destructive weather event, but usually occurs in Stockton as strong storms and/or heavy fog. Severe weather is usually caused by intense storm systems, although strong winds can occur without a storm. The types of dangers posed by severe weather vary widely and may include injuries or deaths, damage to buildings and structures, fallen trees, roads and railways blocked by debris, and fires sparked by lightning. Severe weather can produce high winds and lightning that can damage structures and cause power outages. Lightning from these storms can ignite structure fires that can cause damage to buildings and endanger people. Objects such as vehicles, unprotected structures (e.g., bus stops, car ports), fences, telephone poles, or trees can also be struck directly by lightning, which may result in an explosion or fire.

Severe weather is an annual occurrence in San Joaquin County. However, actual damage associated with the primary effects of severe weather have been limited. Climate change is expected to cause an increase in intense rainfall and strong storm systems. This means that Stockton could see more intense weather resulting from these storms in the coming years and decades, although such an increase may not affect all forms of severe weather. Though average annual rainfall may increase only slightly, climate change is expected to cause an increase in the number of years with intense levels of precipitation. Heavy rainfall can increase the frequency and severity of other hazards, including flooding. The incidence of winter fog has decreased dramatically over the past three decades, due in part to declines in winter chill caused by climate change.

### **Human Health Hazards**

Human health hazards are bacteria, viruses, parasites, and other organisms that are spread by

insects, animals, and other pest organisms and can cause diseases and illness in people. Some of these diseases may cause only mild inconvenience, but others are potentially life threatening. These diseases can be and often are carried by animals, such as mice and rats, ticks, and mosquitos. Warmer temperatures and high levels of precipitation can lead to increased populations of disease-carrying animals, creating a greater risk of disease and increased rates of infection. Populations most vulnerable to human health hazards are those who spend a disproportionate amount of time outdoors, those with fragile immune systems or existing illnesses, and those who may live in sub-standard housing or not have access to health insurance and medical care.

Human health hazards of various scales and levels of severity are likely to continue to occur in the future. Climate change is projected to contribute to increases in average temperature and changes in precipitation patterns that favor large precipitation events and associated flooding. These changes in climatic changes promote the reproduction and speed the growth of many pest species, leading to higher populations of potential disease vectors. Overall risk of human health hazards is thus expected to increase.

#### **POLICY SAF-2.7CH-5.21**

**Accommodate a changing climate through adaptation, mitigation, and resiliency planning and projects.**

#### **Action SAF-2.7CH-5.21A**

Create a city-specific Local Hazard Mitigation Plan and incorporate this plan into the Safety Element. Begin creation of the plan within one year.

#### **Action SAF-2.7CH-5.2B**

Conduct regular updates to the ~~Upon the next revision of the City's Local Hazard Mitigation Plan, conduct a comprehensive climate change vulnerability assessment and associated to inform~~

the development of adaptation and resilience policies and strategies, and incorporate them into the Safety Element, in accordance with SB 379.

#### **Action CH-5.1B**

Maintain and implement the City of Stockton Climate Action Plan (CAP) and update the CAP to include the following:

- Updated communitywide GHG emissions inventory;
- 2030 GHG emissions reduction target, consistent with SB 32;
- Estimated 2030 GHG emissions reduction benefits of State programs;
- Summary of the City's progress toward the 2020 local GHG emissions reduction target;
- New and/or revised GHG reduction strategies that, when quantified, achieve the 2030 reduction target and continue emission reductions beyond 2030; and
- New or updated implementation plan for the CAP.

#### **Action SAF-2.7CH-5.21C**

Continue to participate in regional climate change vulnerability assessment, adaptation planning, and resilience efforts. Accommodate a changing climate through adaptation and resiliency planning and projects, including through pursuit of grant funding for implementation of resilience efforts.

#### **Action SAF-2.7CH-5.2D**

Continue to identify opportunities to expand the City's organization capacity to respond to the effects of climate change.

#### **Action SAF-2.7CH-5.2E**

Establish a network of equitably located community resilience centers that would offer refuge and backup power for community members in the event of a large-scale disaster or extreme heat event, including as a last resort shelter-in-place location.

**Action SAF-2.7CH-5.2F**

Install backup power and water resources at critical City facilities, emergency shelters, and cooling centers in case of power and water outages.

**Action SAF-2.7CH-5.2G**

Work with regional and local partners to increase the number of solar and battery systems installed at homes, businesses, and City facilities.

**~~community~~ Action SAF-2.7CH-5.2H**

Coordinate with transit providers to identify and advertise ways for individuals with restricted mobility to reach resilience centers, cooling centers, and alternate care sites.

**Action SAF-2.7CH-5.2I**

Conduct targeted public outreach and education about cooling strategies for those populations sensitive to higher temperatures, especially seniors and those who work outdoors, lack permanent shelter, and lack air conditioning.

**Action SAF-2.7CH-5.2J**

Partner with local community-based organizations to pursue grant funding opportunities to provide financial assistance or reduced costs for energy retrofits, cooling, ventilation, or other adaptation measures to help protect low-income households, senior citizens, and other vulnerable persons against extreme heat events.

**Action SAF-2.7CH-5.2K**

~~Deploy~~Plant trees and installation more of green space in order to provide shade and combat high heat, with a focus on neighborhoods that are most vulnerable to heat.

**Action SAF-2.7CH-5.2L**

Target residents living within the wildland urban interface (as shown in Figure XX5-10) with

information about the dangers of living in a wildfire hazard area and strategies for reducing wildfire risk.

**Action SAF-2.7CH-5.2M**

~~Target residents living within the wildland urban interface (as shown in Figure XX) with information about the dangers of living in a wildfire hazard area and strategies for reducing wildfire risk.~~

**Action SAF-2.7CH-5.2NM**

Work with existing property owners within wildland-urban interface areas to establish and maintain fire breaks and defensible space, vegetation clearance, emergency access roads, water supply and fire flow, signage, and firefighting infrastructure that meets current adopted State, County, or community fire safety standards.

**Action SAF-2.7CH-5.2ON**

Discourage new development within the wildland-urban interface (as shown in Figure XX5-10). If new development does occur within these areas, require any construction of buildings or infrastructure to incorporate fire-safe design features that meet the State Fire Safe Regulations and Fire Hazard Reduction Around Buildings and Structures Regulation for road ingress and egress, fire equipment access, and adequate water supply.

**Action SAF-2.7CH-5.2PO**

Expand and maintain the City's network of public drinking fountains and water dispensers.

**Action SAF-2.7CH-5.2QP** 

Coordinate with local medical providers and Public Health Services of San Joaquin County to ensure low-cost medical and emergency medical services are available to all residents in the city.

**Action SAF-2.7CH-5.2RQ** 

Work with San Joaquin County and the San Joaquin County Mosquito and Vector Control District to monitor the status of mosquitoes and

agricultural and ecosystem pests and contribute resources to pest management initiatives as feasible.

~~Earthquakes are also among the threats to levee and dam stability. According to the Federal Emergency Management Agency (FEMA), most of the levees in the Planning Area meet minimum standards, but levees are subject to structural failure, erosion, and damage from vegetation and rodents, as well as earthquakes and floods (see next section). Given these possible risks, the California Department of Water Resources (DWR) provides Levee Flood Protection Zone (LFPZ) maps to increase awareness of flood risks from levee failure. These zones, shown in Figure 5-2, estimate the maximum area that may be flooded from failure of a State or federal levee.~~

~~As shown in Figure 5-3, Stockton is also within the inundation areas of three major dams:~~

- ~~■ New Hogan Dam on the Calaveras River~~
- ~~■ New Melones Dam on the Stanislaus River~~
- ~~■ Camanche Dam on the Mokelumne River~~

~~Failure of any of these dams (each is about 30 miles from the city) would give residents about 7 hours to evacuate. Other major regional dams could also affect Stockton, but would have longer lead times. The California Division of Safety of Dams (DSOD) inspects each dam on an annual basis to ensure the dam is safe and performing as intended. The dams have also been assessed for seismic stability and are projected to withstand the maximum credible earthquake.~~

#### **POLICY SAF-2.1**

**Ensure that community members are adequately prepared for natural disasters and emergencies through education and training.**

##### **Action SAF-2.1A**

~~Develop neighborhood watch and emergency support groups to be trained and put into action in the event of an emergency in support of government staff.~~

##### **Action SAF-2.1B**

~~Inform the public about the specific risks of living in flood-prone areas, and provide residents instructional information on how to take steps to reduce their exposure to flood damages.~~

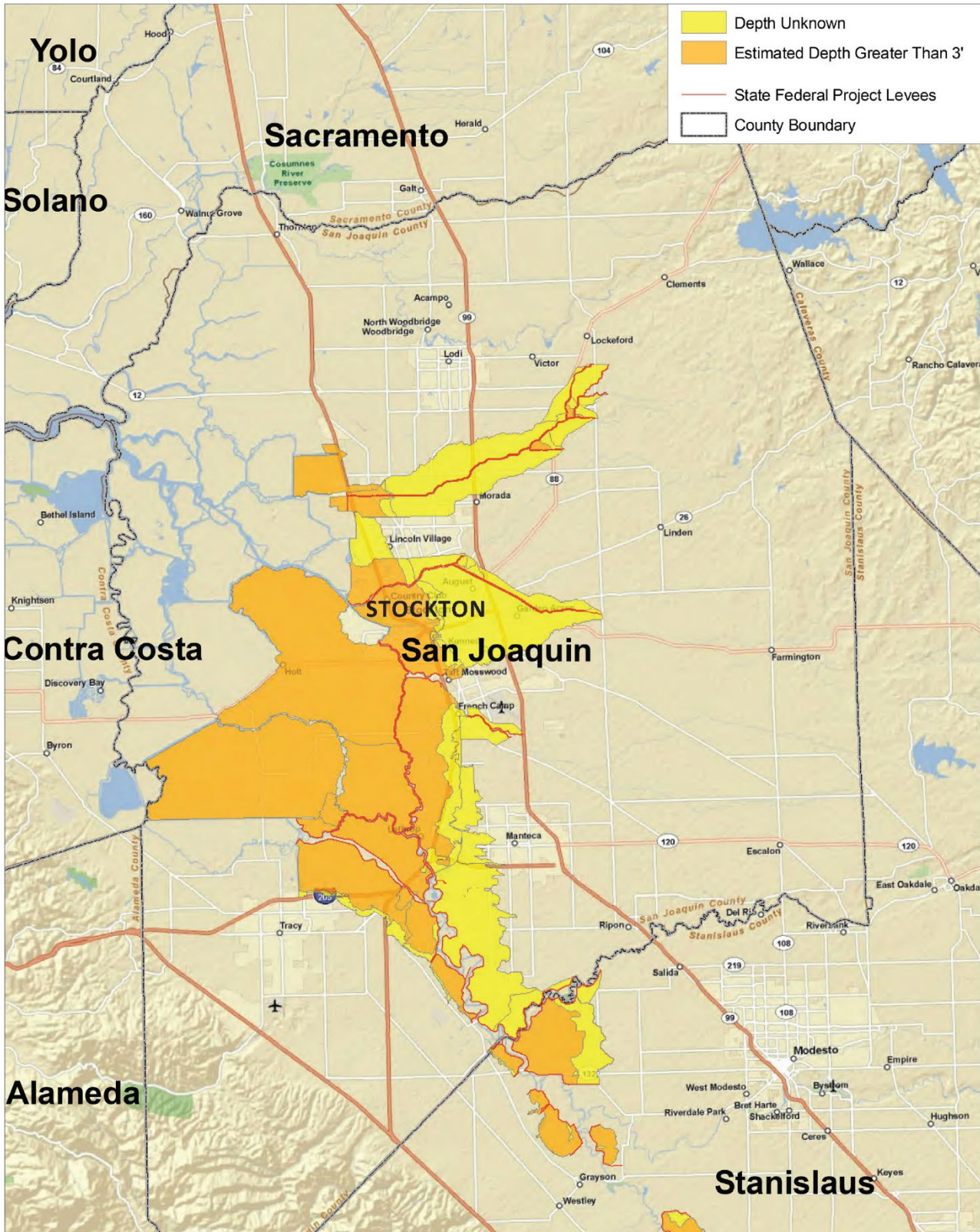
#### **POLICY SAF-2.2**

**Prepare sufficiently for major events to enable quick and effective response.**

##### **Action SAF-2.2A**

~~Require new development to provide adequate access for emergency vehicles and evacuation routes, including by designing roadway systems to provide multiple escape routes in the event of a levee failure.~~

**Figure 5-2**  
**Levee Flood Protection Zones**

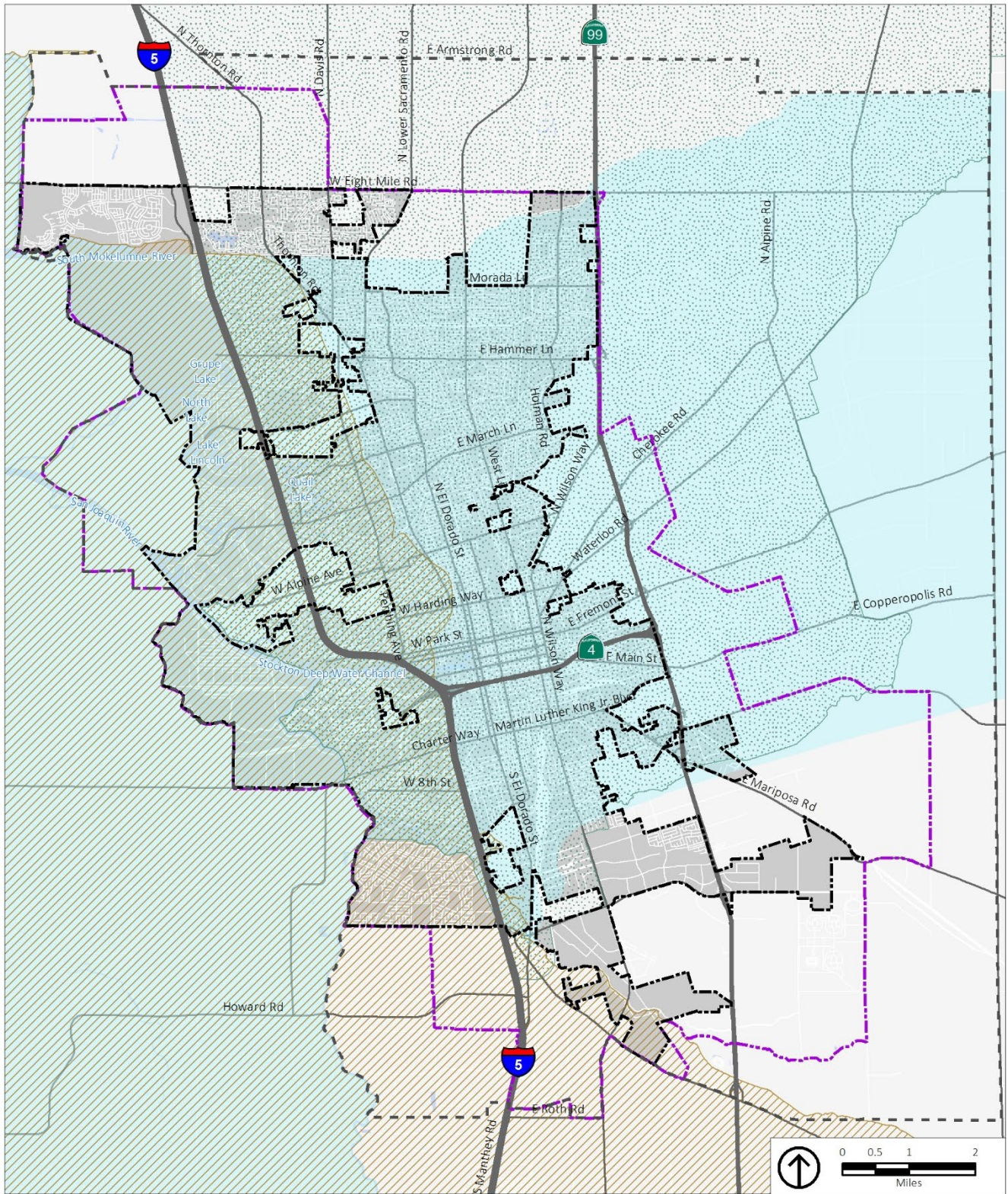


Source: California Department of Water Resources, 2011.





**Figure 5-3**  
**Dam Inundation Areas**



Source: San Joaquin County, 2017; PlaceWorks, 2017.

- |                             |                            |
|-----------------------------|----------------------------|
| <b>Dam Inundation Areas</b> | City Limit                 |
| Camanche Dam                | Sphere of Influence        |
| New Melones Dam             | General Plan Planning Area |
| New Hogan Dam               |                            |

**Action SAF-2.2B**

~~Formulate, review, periodically update, and make available to the public emergency management plans for the safe evacuation of people from areas subject to inundation from levee and dam failure.~~

**Action SAF-2.2C**

~~Require new critical facilities, including hospitals, emergency operations centers, communications facilities, fire stations, and police stations, to be located, designed, and constructed to avoid or mitigate potential risks and ensure functional operation during flood events (i.e., avoid locating in the 100-year and 200-year floodplains), seismic and geological events, fires, and explosions.~~

**Action SAF-2.2D**

~~Continue to work with San Joaquin County, the County Office of Emergency Services, other cities in the region, and disaster agencies to coordinate disaster and emergency preparedness planning.~~

## **~~PARTS OF STOCKTON ARE AT RISK FROM FLOODING~~**

~~Reclamation of Delta land over many years has reduced available floodplain and increased flooding potential, especially along the western boundary of the community. Land along local waterways is protected by levees, but earthquakes or overtopping due to major storms can cause levees to fail. Stockton has historically faced flooding, especially during the 1950's:~~

- ~~■ **1950:** Almost 14,000 acres of the Delta~~



~~flooded, washing out the Southern Pacific Railroad tracks and State Highway 50 west of Stockton.~~

- ~~■ **1955-1956:** Extensive flooding occurred along the eastern tributaries of the San Joaquin River.~~

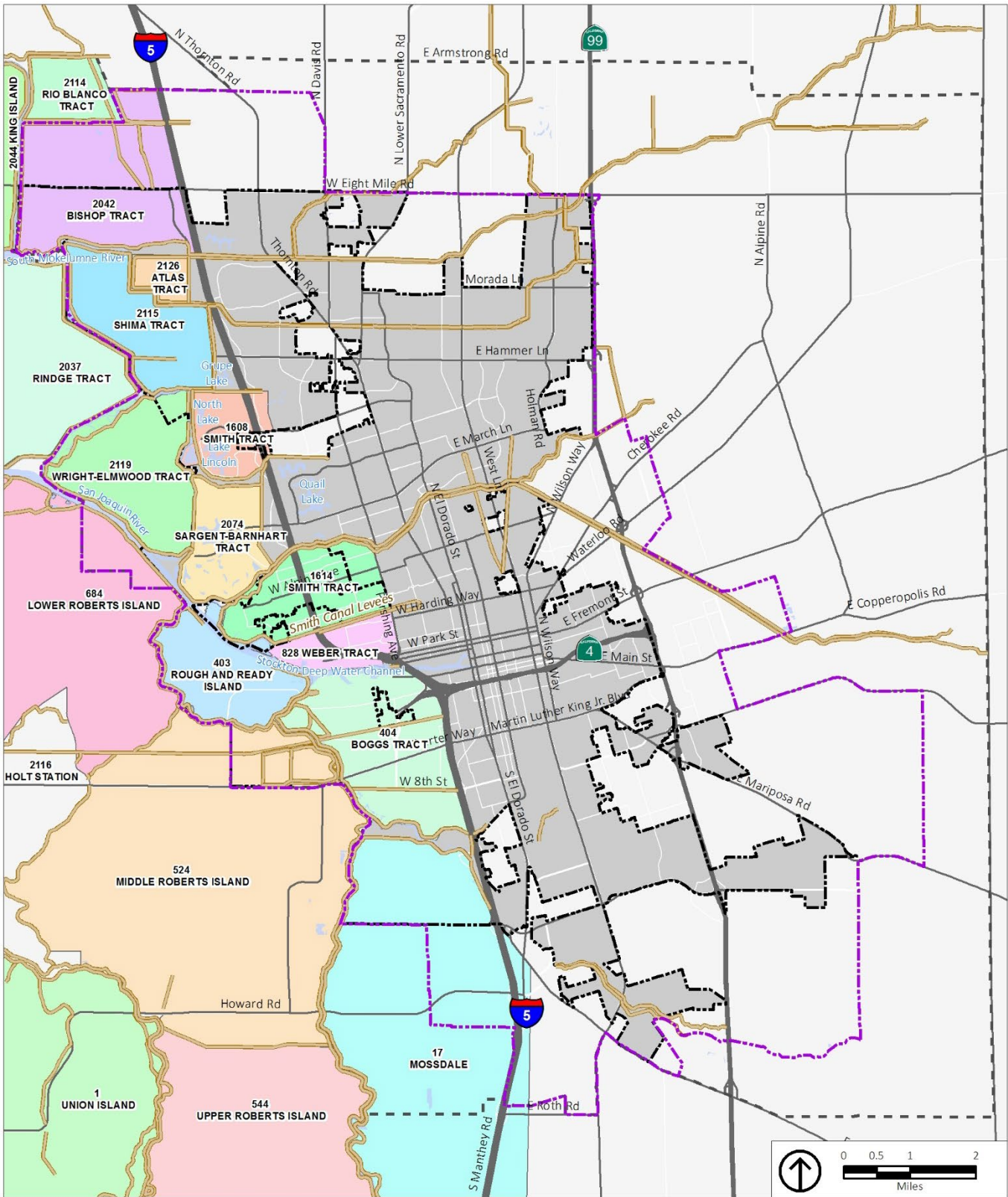
- ~~■ **1958:** Approximately 250,000 acres from Stockton to Fresno along the San Joaquin River flooded, in part due to prolonged and unusually voluminous snowmelt from the Sierra Nevada.~~

~~Since 1998, flood risks have been reduced significantly through the Locally Constructed Flood Control Project by the San Joaquin Area Flood Control Agency, which includes flood protection facilities on Bear Creek, Little Bear Creek, Pixley Slough, Upper Mosher Creek, the Mosher Diversion, Mosher Slough, the Calaveras River, the Stockton Diverting Canal, and Mormon Slough. Figure 5-4 shows levees in the Stockton area and the boundaries of the local reclamation districts that are responsible for maintaining levees and other flood protection facilities.~~

~~The Federal Emergency Management Agency maps areas at risk of inundation from a 100-year flood, which has a 1 percent chance of occurring in any year, and a 500-year flood, where the risk of flooding is 0.2 percent annually, along with areas protected by levees, as shown in Figure 5-5.~~

~~In Figure 5-6, these flood hazard zones are overlaid on the General Plan land use map to illustrate how planned land uses are affected by flood risk. State Senate Bill 5, adopted in 2007, also requires Central Valley cities to protect development from a 200-year flood, which has a 0.5 percent probability of occurring in any year. Areas that would be subject to flooding levels of 3 feet or more during a 200-year storm are shown on Figure 5-7. The 2012 Central Valley Flood Protection Plan provides additional guidance for regional flood protection, including suggestions for improvements to levees along the San Joaquin River and tributary channels in and around Stockton that are part of the State Plan of Flood Control Facilities, which are shown in Figure 5-8. Areas already protected by those facilities are shown in Figure 5-9, and Figure 5-10 shows waterway and land areas that can help accommodate flood and storm waters.~~

**Figure 5-4**  
**Levees and Reclamation Districts**

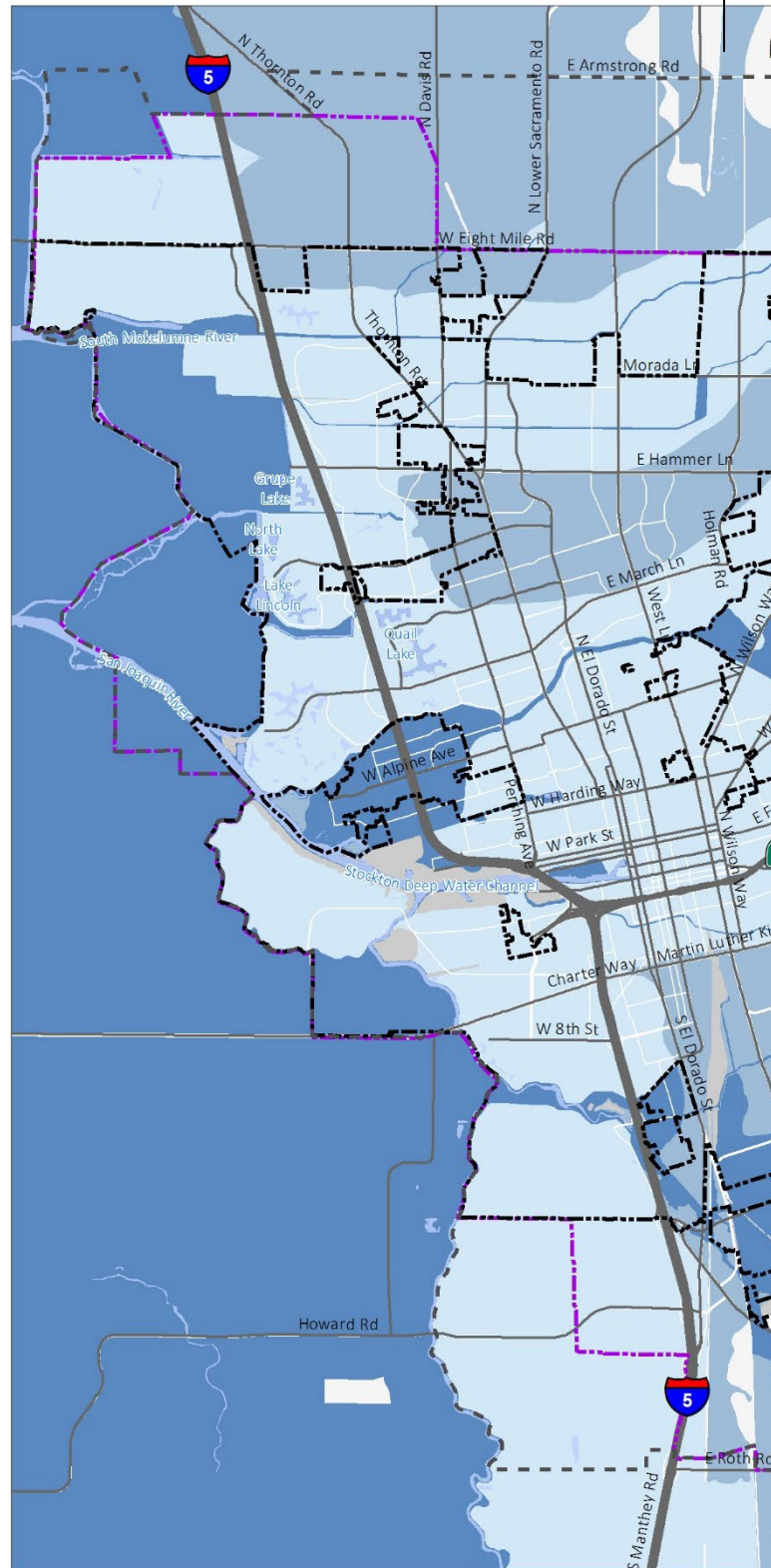


Source: San Joaquin County, 2016; PlaceWorks, 2017.

- Levees
- City Limit
- Sphere of Influence
- General Plan Planning Area

Figure 5-5

FEMA Flood Zones



Source: City of Stockton; San Joaquin County; Federal Emergency Management System

- |                      |                            |
|----------------------|----------------------------|
| <b>Flood Zones</b>   | City Limit                 |
| 100-Year Flood Zone  | Sphere of Influence        |
| 500-Year Flood Zone  | General Plan Planning Area |
| Protected by a Levee |                            |

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### **POLICY SAF-2.3**

#### **Protect the community from potential flood events.**

##### **Action SAF-2.3A**

Coordinate with appropriate State, federal, and local flood control agencies to develop a flood protection plan for the levee systems protecting the city that:

- Identifies the levees protecting the city and the entities responsible for the operation and maintenance of the levees;
- Determines the flood levels in the waterways and the level of protection offered by the existing levees along the waterways;
- Identifies a long term plan to upgrade the system as necessary to provide at least a 100-year level of flood protection to the city, and 200-year level of flood protection, where feasible;
- Encourages multi-purpose flood management projects that, where feasible, incorporate recreation, resource conservation, preservation of natural riparian habitat, and scenic values of the city's streams, creeks, and lakes; and
- Includes provisions for updates to reflect future State or federally mandated levels of flood protection.

##### **Action SAF-2.3B**

Collaborate with State and local flood management agencies and other interested parties to develop funding mechanisms to finance the local share of flood management responsibilities, and maintain cooperative working relationships with appropriate agencies to minimize flood hazards and improve safety.

##### **Action SAF-2.3C**

Require new public and private waterfront development to be oriented to waterways and provide setbacks and easements along levees and channels to provide space for levee widening, flood fighting, roadway and

~~maintenance access, open space and trail amenities, and appropriate landscaping.~~

##### **Action SAF-2.3D**

~~Prepare and maintain a map of evacuation routes for major flood events.~~

### **POLICY SAF-2.4**

~~Minimize risks to the community from flooding through appropriate siting and protection of structures and occupants.~~

##### **Action SAF-2.4A**

~~Regulate new urban development in accordance with State requirements for 200-year level of flood protection and federal requirements for 100-year level of flood protection.~~

##### **Action SAF-2.4B**

~~Investigate and implement when feasible mitigation measures that offer 200-year level of flood protection for existing urban development in flood-prone areas.~~

##### **Action SAF-2.4C**

~~Preserve floodways and floodplains for non-urban uses to maintain existing flood-carrying capacities, except when mitigated in conformance with the City's floodplain management program.~~



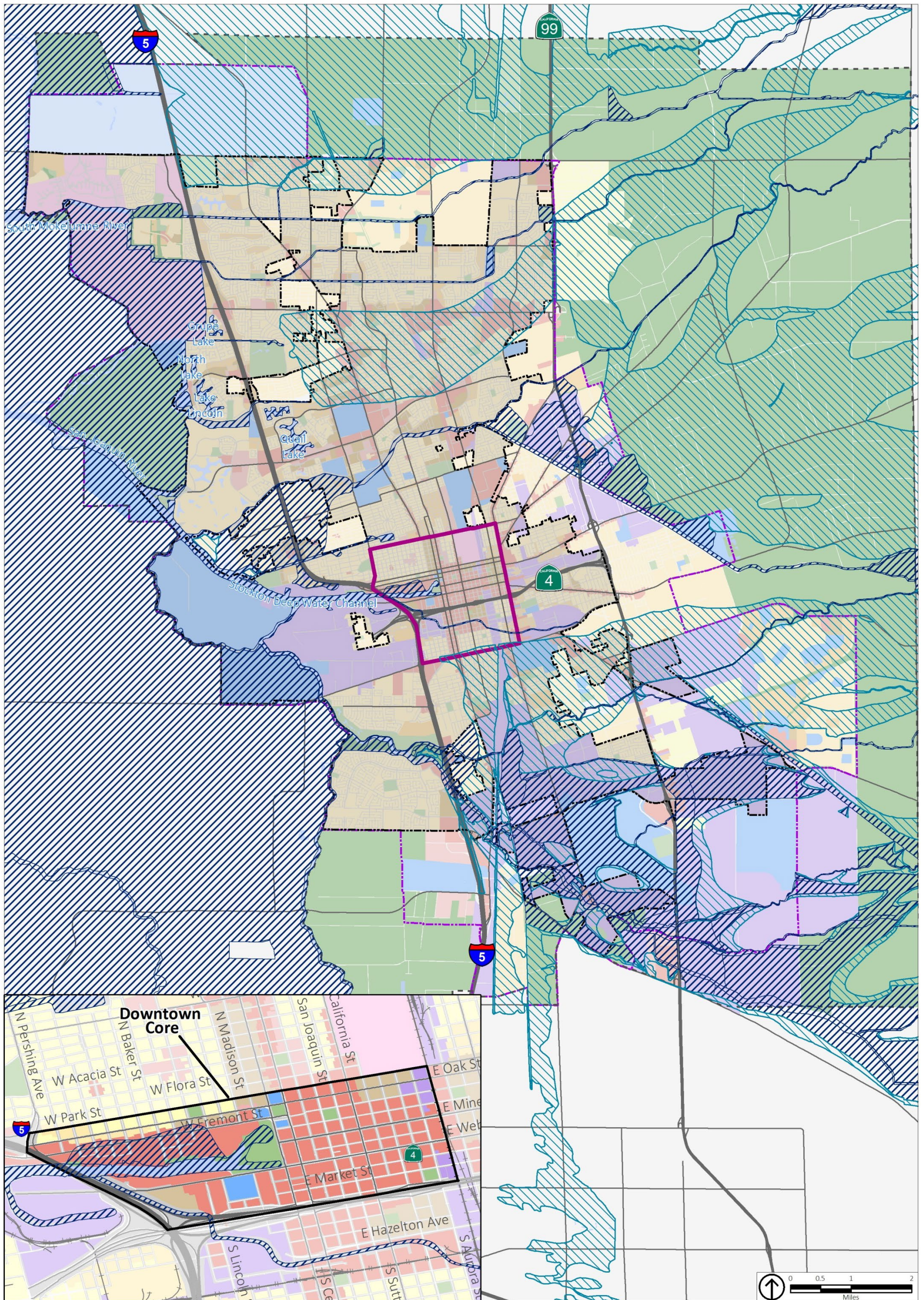
~~**Action SAF-2.4D**~~

~~Consider the best available flood hazard information and mapping from regional, State, and federal agencies to inform land use and public facilities investment decisions.~~

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Figure 5-6

Planned Land Uses in Flood Hazard Zones



Source: Federal Emergency Management Agency, 2016; City of Stockton, 2017; PlaceWorks, 2017.

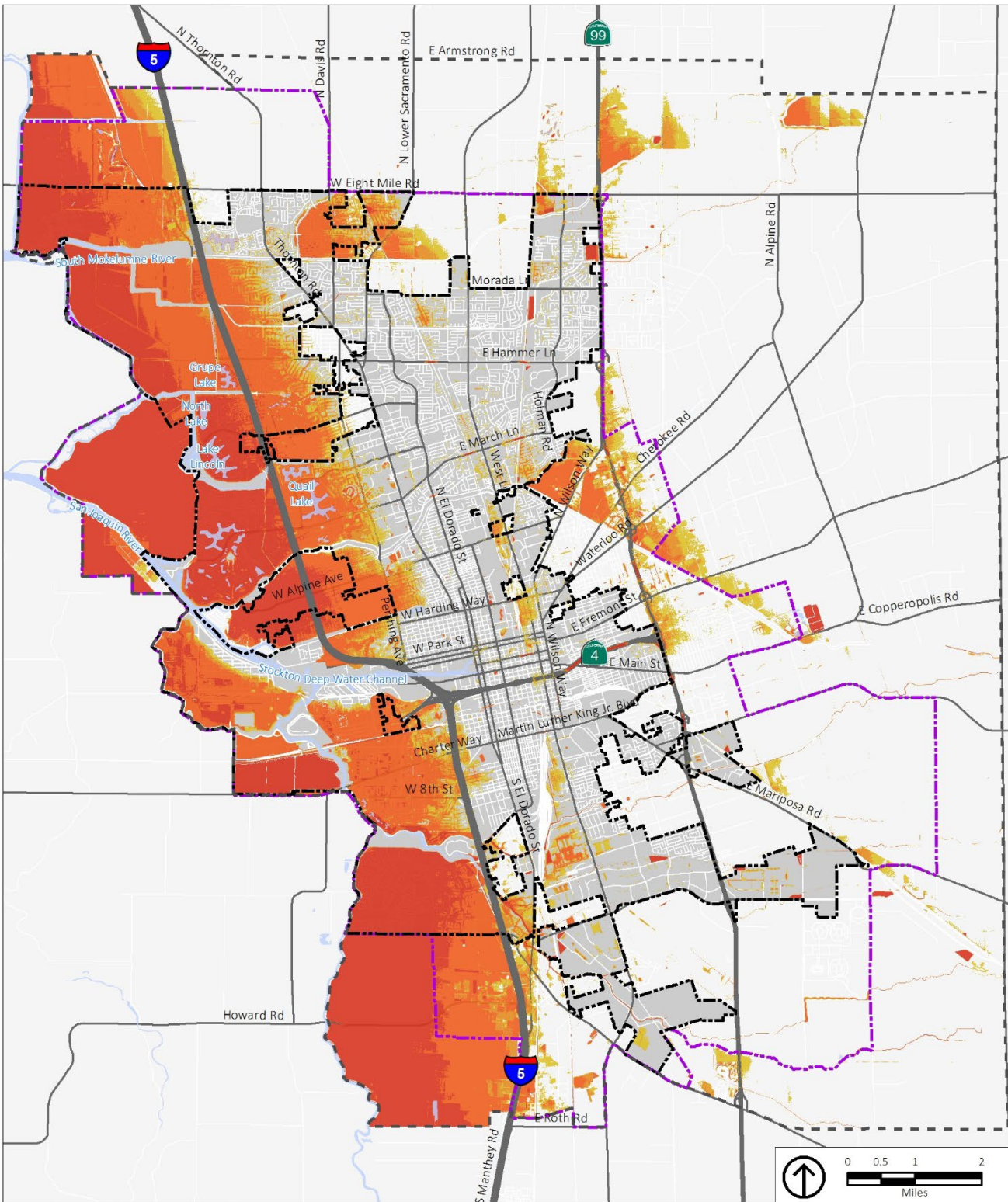




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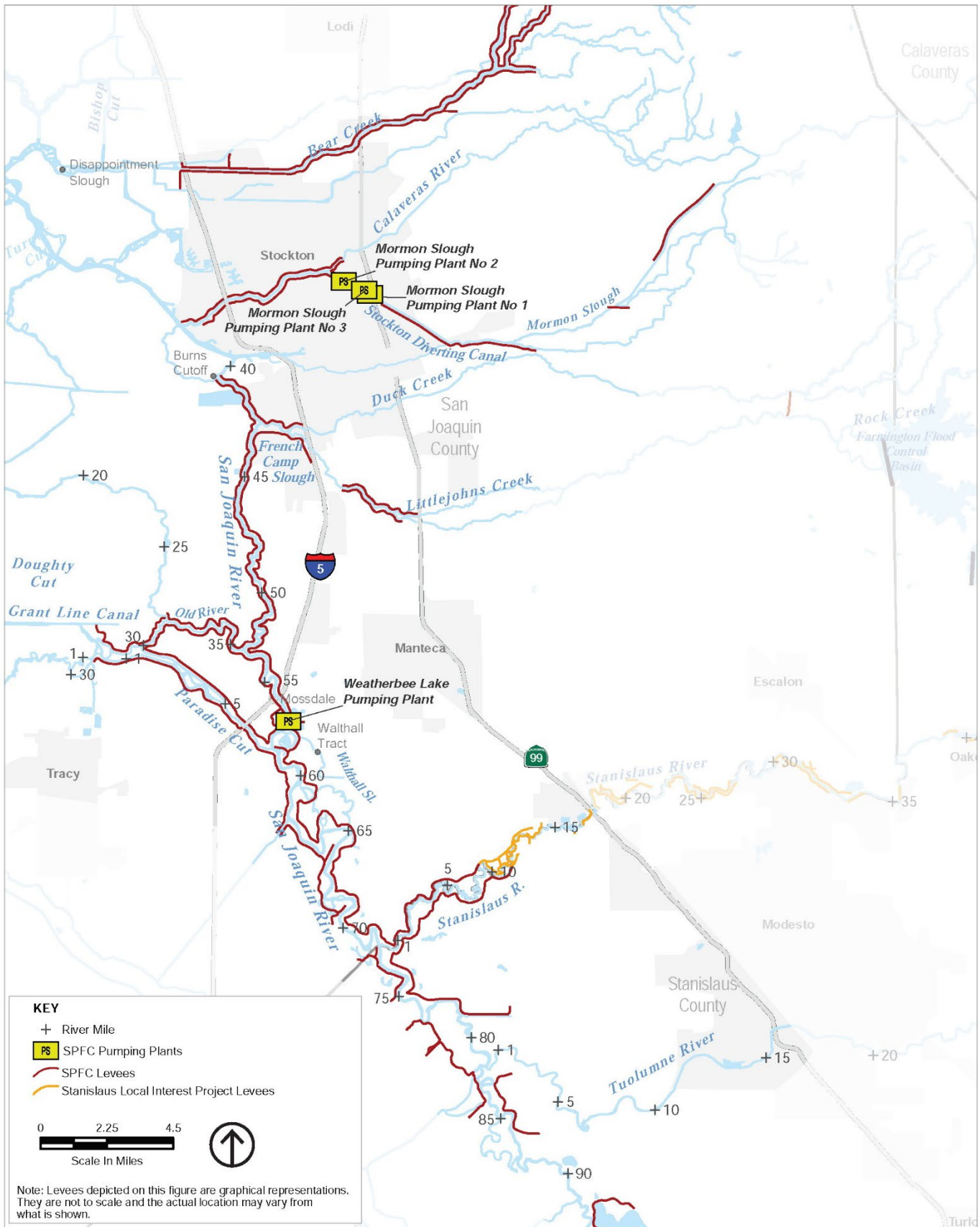
**Figure 5-7**  
**200-Year Storm Flood Depths**



Source: California Department of Water Resources, 2016; PlaceWorks, 2017.

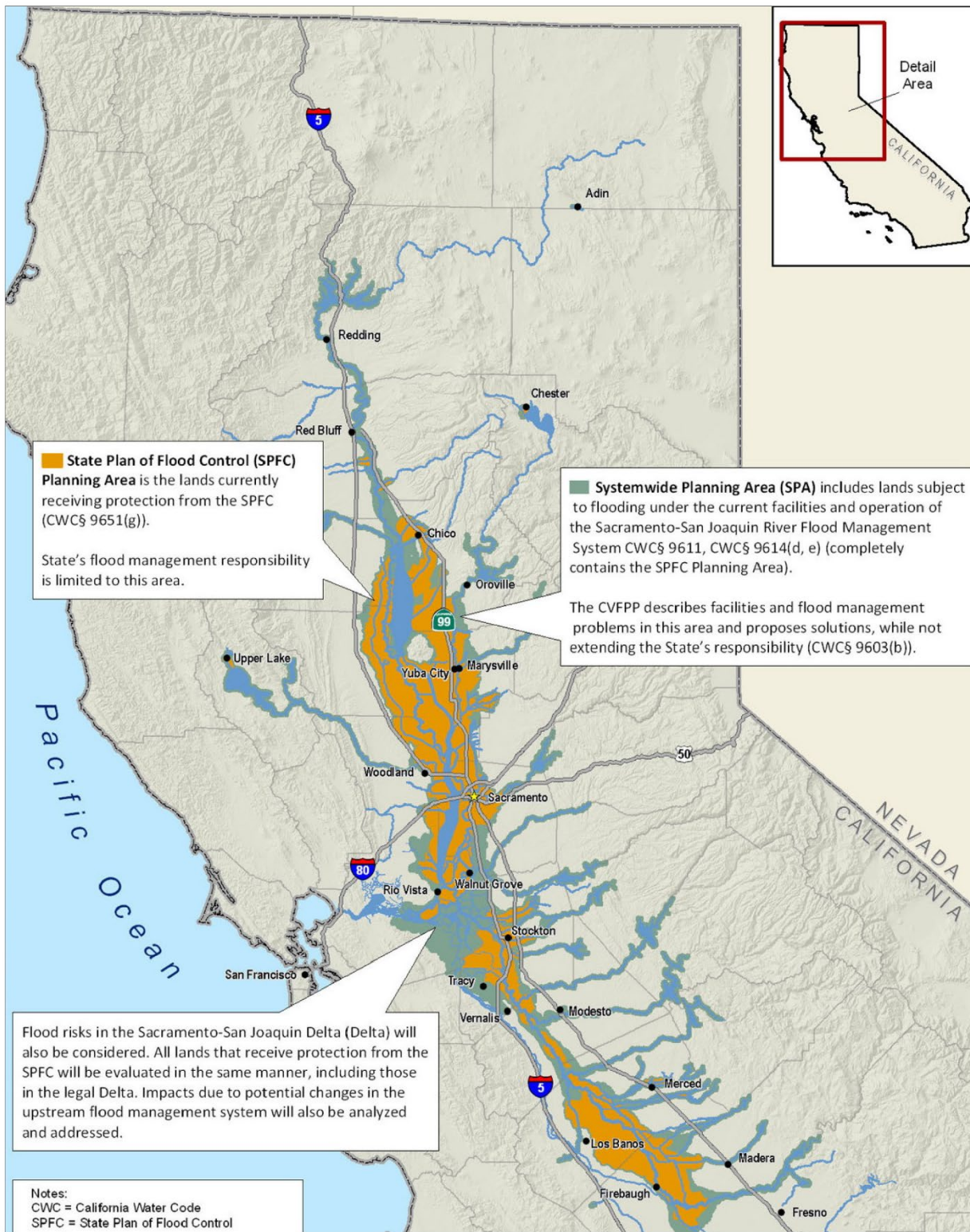
- |                                   |                            |
|-----------------------------------|----------------------------|
| <b>200-Year Storm Flood Depth</b> | City Limit                 |
| 3 - 4 feet                        | Sphere of Influence        |
| 4 - 5 feet                        | General Plan Planning Area |
| 5 - 10 feet                       |                            |
| > 10 feet                         |                            |

**Figure 5-8**  
**State Plan of Flood Control Facilities in the Stockton Area**



Source: California Department of Water Resources, 2010.

**Figure 5-9**  
**Areas Protected by State Plan of Flood Control Facilities**



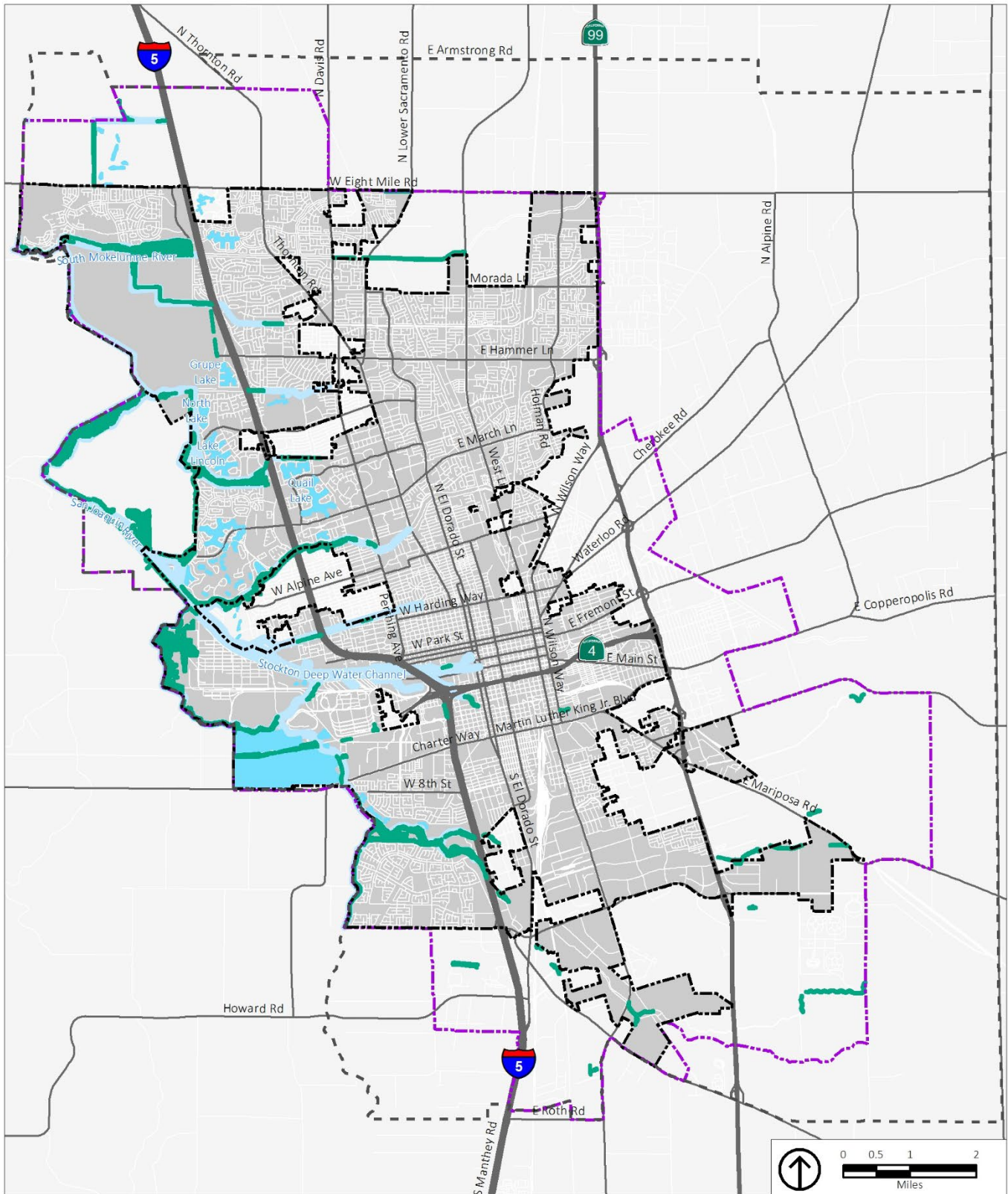
Source: California Department of Water Resources, 2011.



Figure 5-7  
**Areas Protected by State Plan of Flood Control Facilities**

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**Figure 5-10**  
**Floodwater Accommodations**



Source: CA Department of Fish & Wildlife, 2016; City of Stockton, 2017; PlaceWorks, 2017.

- Riparian Areas and Wetlands
- City Limit
- Lakes, Reservoirs, and Ponds
- Sphere of Influence
- Streams and Rivers
- General Plan Planning Area

## NOISE CAN DETRACT FROM QUALITY OF LIFE

Noise can affect the way people live and work. Some types of noise are only short-term irritants, like the pounding of a jackhammer or the whine of a leaf blower. These mobile sources can generally be controlled through the City's noise ordinance, but fixed sources such as roads, the railroad, and the airport instead require the City to ensure that land uses, especially "sensitive receptors" like homes and schools, do not bring people too close to noise, unless noise reduction measures like thicker walls and windows are determined to be acceptable.

State law requires general plans to use the Community Noise Equivalent Level (CNEL) or the Day/Night Average Sound Level ( $L_{dn}$ ) to describe the community noise environment (in decibels, "dBA") and its effects on the population. The City of Stockton land use compatibility standards for noise are shown in Table 5-1, and the future 2040 roadway noise conditions are depicted graphically on Figure 5-11.

### **POLICY SAF-2.58**

**Protect the community from health hazards and annoyance associated with excessive noise levels.**

### **Action SAF-2.5A**

Prohibit new commercial, industrial, or other noise-generating land uses adjacent to existing sensitive noise receptors such as residential uses, schools, health care facilities, libraries, and churches if noise levels are expected to exceed 70 dBA Community Noise Equivalent (CNEL) (decibels on A-weighted scale CNEL) when measured at the property line of the noise sensitive land use.

### **Action SAF-2.5B**

Require projects that would locate noise sensitive land uses where the projected ambient noise level is greater than the "normally acceptable" noise level indicated on Table 5-1 to provide an acoustical analysis that shall:

- Be the responsibility of the applicant;
- Be prepared by a qualified person experienced in the fields of environmental noise assessment and architectural acoustics;
- Include representative noise level measurements with sufficient sampling periods and locations to adequately describe local conditions;
- Estimate existing and projected (20-year) noise levels in terms of  $L_{dn}$ /CNEL and compare the levels to the adopted noise policies and actions in this General Plan;
- Recommend appropriate mitigation to achieve compatibility with the adopted noise policies and standards;
- Where the noise source in question consists of intermittent single events, address the effects of maximum noise levels in sleeping rooms in terms of possible sleep disturbance;
- Estimate noise exposure after the prescribed mitigation measures have been implemented;
- If the project does not comply with the adopted standards and policies of this General Plan, provide acoustical information for a statement of overriding considerations for the project; and
- Describe a post-project assessment program, which could be used to evaluate the effectiveness of the proposed mitigation measures.

### **Action SAF-2.5C8C**

Require noise produced by commercial uses to not exceed 75 dB  $L_{dn}$ /CNEL at the nearest property line.

### **Action SAF-2.5D8D**

Grant exceptions to the noise standards for commercial and industrial uses only if a recorded noise easement is conveyed by the affected property owners.



**Action SAF-2.5E8E**

Require all new habitable structures to be set back from railroad tracks to protect residents from noise, vibration, and safety impacts.

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**Table 5-1: Maximum Allowable Noise Exposure by Land Use**

LAND USE TYPE	NOISE LEVEL, $L_{DN}$ (DBA)						
	0-55	56-60	61-65	66-70	71-75	75-80	>81
Residential			Normally Acceptable	Normally Acceptable	Unacceptable	Unacceptable	Unacceptable
Urban Residential Infill					Conditionally Acceptable	Unacceptable	Unacceptable
Hotels, Motels			Normally Acceptable	Normally Acceptable	Normally Acceptable	Unacceptable	Unacceptable
Schools, Libraries, Churches, Hospitals, Extended Care Facilities			Normally Acceptable	Normally Acceptable	Unacceptable	Unacceptable	Unacceptable
Auditoriums, Concert Halls, Amphitheaters	Conditionally Acceptable	Conditionally Acceptable	Conditionally Acceptable	Conditionally Acceptable	Unacceptable	Unacceptable	Unacceptable
Sports Arenas, Outdoor Spectator Sports		Conditionally Acceptable	Conditionally Acceptable	Conditionally Acceptable	Conditionally Acceptable	Unacceptable	Unacceptable
Playgrounds, Neighborhood Parks					Unacceptable	Unacceptable	Unacceptable
Golf Courses, Riding Stables, Water Recreation, Cemeteries				Conditionally Acceptable	Conditionally Acceptable	Conditionally Acceptable	Unacceptable
Office Buildings, Business Commercial and Professional				Conditionally Acceptable	Conditionally Acceptable	Unacceptable	Unacceptable
Mining, Industrial, Manufacturing, Utilities, Agriculture					Conditionally Acceptable	Conditionally Acceptable	Unacceptable

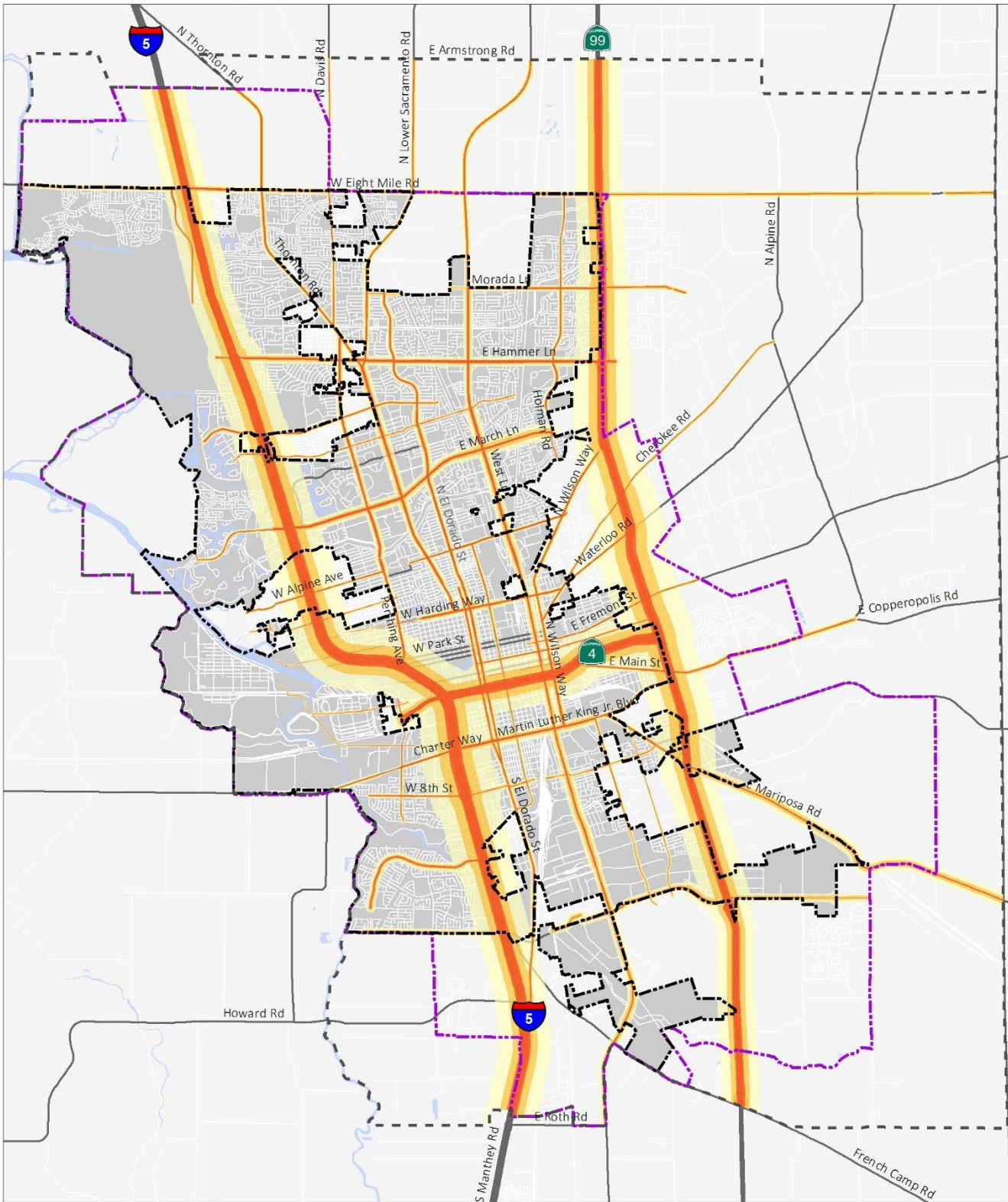
**Normally Acceptable.** Specified land use is satisfactory based on the assumption that any buildings involved are of normal, conventional construction, without any special noise insulation requirements.

**Conditionally Acceptable.** New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed insulation features have been included in the design.

**Unacceptable.** New construction or development should not be undertaken.

Notes: If existing noise standards are currently exceeded, a proposed project shall not incrementally increase noise levels by more than 3 dBA. Urban residential infill applies to residential uses in the Greater Downtown.

**Figure 5-11**  
**2040 Roadway Noise Contours**



Source: City of Stockton; PlaceWorks, 2016.

**Future (2040) Noise Contours**

- 70dB
- 65dB
- 60dB

- City Limit
- Sphere of Influence
- General Plan Planning Area

## HAZARDOUS MATERIALS NEED TO BE CONTROLLED

State and federal laws regulate the production, storage, handling, and disposal of hazardous materials and waste, including industrial wastes, pesticides, radioactive substances, asbestos, and combustible fuels. Hazardous materials commonly used in the home include garden pesticides, waste oil, paint supplies, car batteries, and pool chemicals. Limited quantities of household hazardous waste may be transported to and dropped off at a recycling center. State and federal rules require inventory and reporting for businesses that store more than 55 gallons of hazardous liquids, 500 pounds of solids, or 200 cubic feet of compressed gases, including plans for incident prevention and emergency response and evacuation.

Although hazardous materials are carefully regulated today, past activities have left some contaminated sites in Stockton, as well as others where contamination is suspected and investigation is underway. Contamination has resulted from leaking underground storage tanks, disposal of hazardous materials, and various past industrial practices. The California Department of Toxic Substances Control oversees cleanup of such sites, but the potential for accidents and spills means that the City also must strive to reduce risks.

### **POLICY SAF-2.69**

**Minimize the risk to city residents and property associated with the transport, distribution, use, and storage of hazardous materials.**

### **Action SAF-2.6A9A**

Restrict transport of hazardous materials within the city to routes that have been designated for such transport.



### **Action SAF-2.6B9B**



When appropriate, require new development to prepare a hazardous materials inventory and/or prepare Phase I or Phase II hazardous materials studies, including any required cleanup measures.

### **Action SAF-2.6C**



Educate the public regarding about the types of household hazardous wastes and the proper methods of for their disposal.

### **Action SAF-2.79DE**



Restrict, to the extent feasible, development of new hazardous- waste storage facilities in within mapped 100-year flood hazard zones, -levee protection areas, and areas subject to sea level rise in 2085 (see Figures 5-4XX and XX5-8)rise.

### **Action SAF-2.79EE**



Work with existing handlers of hazardous materials and the Stockton Fire Department to reduce the risk of hazardous materials exposures in the event of flooding.

## GOAL SAF-3: CLEAN WATER

Sustain clean and adequate water supplies.

### EVERYONE HAS A RIGHT TO CLEAN WATER

Access to safe water is a fundamental human need for both physical and social health. Maintaining clean water supplies requires constant vigilance, significant expenditures, and sometimes changes in behavior, especially as the impacts of human activities become more pervasive.

Water supply, quality, and distribution are vital to Stockton's ability to serve its population now and in the future. Regulatory pressures, droughts, and saline intrusion affecting groundwater supplies have already strained the region's water supplies. As a result, the City has focused attention on the availability of existing surface water supplies, and is cooperating with other agencies in the region to manage groundwater resources at a sustainable yield.

Meanwhile, water conservation and efficiency has become a normal way of life in and around Stockton. Increasing use of reclaimed (or "recycled") water can be an effective way to protect water supply. For example, simple "graywater" systems can re-use water from bathroom sinks, showers, bathtubs, and washing machines to irrigate landscaping. Stockton also is committed to protecting water quality by ensuring adequate collection, treatment, and safe disposal of wastewater.

#### POLICY SAF-3.1

**Secure long-term renewable contracts and related agreements to ensure that surface water rights will be available to meet projected demand.**



#### Action SAF-3.1A

Actively participate in appropriate forums designed to discuss and solve regional water supply and quality issues.

#### POLICY SAF-3.2

**Protect the availability of clean potable water from groundwater sources.**

#### Action SAF-3.2A

Continue to cooperate with San Joaquin County, Stockton East Water District, and CalWater to monitor groundwater withdrawals and ensure that they fall within the target yield for the drinking water aquifer.

#### Action SAF-3.2B

Require new development to employ low impact development (LID) approaches, including:

- Conserving natural areas and reducing imperviousness
- Runoff storage
- Hydro-modification (to mimic pre-development runoff volume and flow rate)
- Reducing trash accumulation
- Public education and outreach

### **POLICY SAF-3.3**

**Encourage use of recycled ("gray") water for landscaping irrigation to reduce demand on potable supplies.**

#### **Action SAF-3.3A**

Require new development to install non-potable water infrastructure for irrigation of large landscaped areas where feasible.

#### **Action SAF-3.3B**

Investigate and implement Code amendments to allow installation of dual plumbing and/or rainwater capture systems to enable use of recycled water and/or captured rainwater generated on-site.

### **POLICY SAF-3.4**

**Ensure adequate collection, treatment, and safe disposal of wastewater.**

#### **Action SAF-3.4A**

Require all new urban development to be served by an adequate wastewater collection system to avoid possible contamination of groundwater from onsite wastewater disposal systems.

#### **Action SAF-3.4B**

Conduct outreach and provide information to encourage homeowners with septic tanks to abandon existing septic tanks and hook up to the City wastewater collection system.

#### **Action SAF-3.4C**

Continue to discharge treated effluent to the Delta and reuse that water through the City's California Water Code Section 1485 water right.

## GOAL SAF-4: CLEAN AIR

Improve local air quality.

### AIR QUALITY IN THE VALLEY HAS TO IMPROVE

The San Joaquin Valley Air Basin is burdened by air pollution from a variety of industrial and vehicular sources. Topographic and meteorological conditions unique to the area trap these particulates and generate high levels of unhealthy air in the region. The San Joaquin Valley Air Pollution Control District oversees plans and control measures to address air pollution, primarily from stationary sources such as industry and power plants. The District also enforces rules and regulations to control air pollution and to assess potential air quality impacts of proposed land uses. The City of Stockton also plays an important role in helping to minimize air pollutant emissions, both through direct regulations on land use activities and through policies and actions that help reduce the need to travel long distances and that promote alternatives to single-occupancy vehicular travel. Goals, policies, and actions that address air quality are highlighted with the icons throughout the document.

#### POLICY SAF-4.1

**Reduce air impacts from mobile and stationary sources of air pollution.**

##### Action SAF-4.1A

Require the construction and operation of new development to implement best practices that reduce air pollutant emissions, including:

- Use of low-emission and well-maintained construction equipment, with idling time limits.
- Development and implementation of a dust control plan during construction.
- Installation of electrical service connections at loading docks, where appropriate.

- Installation of Energy Star-certified appliances.
- Entering into Voluntary Emissions Reduction



Agreements with the San Joaquin Valley Air Pollution Control District.

#### Action SAF-4.1B

Use the results of the Health Risk Assessments required by the California Air Toxics "Hot Spots" Act to establish appropriate land use buffer zones around any new sources of toxic air pollutants that pose substantial health risks.

##### Action SAF-4.1C

Require the use of electric-powered construction and landscaping equipment as conditions of project approval when appropriate.

##### Action SAF-4.1D

Limit heavy-duty off-road equipment idling time to meet the California Air Resources Board's idling regulations for on-road trucks.

#### POLICY SAF-4.2

**Encourage major employers to participate in a transportation demand management program (TDM) that reduces vehicle trips through approaches such as carpooling, vanpooling,**

shuttles, car-sharing, bike-sharing, end-of-trip facilities like showers and bicycle parking, subscription bus service, transit subsidies, preferential parking, and telecommuting.

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**Action SAF-4.2A**  

Provide information and conduct marketing and outreach to major existing and new employers about the transportation demand management (TDM) program facilitated by the San Joaquin Council of Governments.

**POLICY SAF-4.3**

**Coordinate with the San Joaquin Valley Air Pollution Control District and non-profit organizations to promote public awareness on air quality issues and consistency in air quality impacts analyses.**

**Action SAF-4.3A** 

Distribute educational materials from the San Joaquin Valley Air Pollution Control District on the City's website and at its Permit Center.

**Action SAF-4.3B** 

Coordinate review of development project applications with the San Joaquin Valley Air Pollution Control District to ensure that air quality impacts are consistently identified and mitigated during CEQA review.

**Policy SAF-4.4**

**Help the public prepare for and avoid the negative impacts of poor air quality events.**

**Action SAF-4.4A**  

Develop and implement a plan to provide convenient, equitable, accessible clean air indoor refuges during times when outdoor air quality is deemed unhealthy.

**Action SAF-4.4B** 

Work with local employers, service agencies, and health providers to distribute N95 masks during poor air quality events.

**Action SAF-4.4C**  

Work with residents, community service providers, and employers to improve residential and commercial indoor ventilation systems, including

identifying funding assistance for low-income households to purchase air purifiers, air conditioners, fans, or similar devices.

**POLICY CH-5.1SAF-4.5** 

**Reduce community GHG emissions.**

**Action SAF-4.5CH-5.1BA** 

Maintain, implement, and regularly update the City of Stockton Climate Action Plan (CAP) and update the CAP to include the following:

- Updated communitywide GHG emissions inventory;
- 2030 and 2045 GHG emissions reduction targets, consistent with SB 32 and AB 1279;
- Estimated 2030 and 2045 GHG emissions reduction benefits of State programs;
- New and/or revised GHG reduction strategies that, when quantified, achieve the 2030 and 2045 reduction targets and continue emission reductions beyond 2045; and
- New or updated implementation plan for the CAP.

**POLICY SAF-4.6CH-5.32** 

**Expand opportunities for recycling, re-use of materials, and waste reduction.**

**Action CH-5.3SAF-4.62A** 

Use recycled materials and products for City projects and operations where economically feasible, and work with recycling contractors to encourage businesses to use recycled products in their manufacturing processes and encourage consumers to purchase recycled products.

**Action SAF-4.6CH-5.32B**

Continue to require recycling in private and public operations, including construction/demolition debris.





**Action SAF-4-6CH-5.32C**

Expand educational and outreach efforts to promote recycling by occupants of multi-family housing, businesses, and schools.

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