City of Needles

2025 Local Hazard Mitigation Plan

Cal OES/FEMA Review Draft, August 2025

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CHAPTER 1 – INTRODUCTION

Plan Purpose and Authority

Hazard events are emergencies due to a natural or human-caused event that has the potential to cause harm. These events can lead to injuries or death, affect the overall health and safety of a community, damage or destroy public and private property, harm ecosystems, and disrupt key services. Although the hazard event often gets the most attention, it is only part of a larger emergency management cycle.

Emergency planners and responders can take steps during the cycle's response, recovery, mitigation, and preparedness phases to minimize the harm caused by a disaster. The City of Needles 2024 Local Hazard Mitigation Plan (LHMP) focuses on optimizing the mitigation phase of the process.

Hazard mitigation is "any sustained action taken to reduce or eliminate long-term risk to people and property from natural or human-caused hazards and their effects."[1] This mitigation involves making a community more resilient so that when hazard events do ultimately occur, the community suffers minor damage and can recover quickly and effectively. Mitigation differs from preparedness, which involves advanced planning for how best to respond when a disaster occurs or is imminent. For example, a policy to make homes structurally stronger so they suffer minor damage during an earthquake is a mitigation action, while fully equipping emergency shelters to accommodate people who lose their homes in an earthquake is a preparedness action. Some activities may qualify as both.

The Emergency Management Cycle

Resiliency is the "capacity of any entity—an individual, a community, an organization, or a natural system—to prepare for disruptions, to recover from shocks and stresses, and to adapt and grow from a disruptive experience."[2]

Like other communities, the City of Needles (City) could suffer severe harm from hazard events. Although large disasters may cause widespread devastation, minor disasters can have more substantial effects. The City cannot make itself completely immune to hazard events, but this LHMP can help make the community a safer place to live, work, and play. This LHMP provides a comprehensive assessment of the city's threats from natural and human-caused hazard events and a coordinated strategy to reduce these threats. It identifies resources and information to help community members, City staff, and local officials understand local threats and make informed decisions. The LHMP can also support increased coordination and

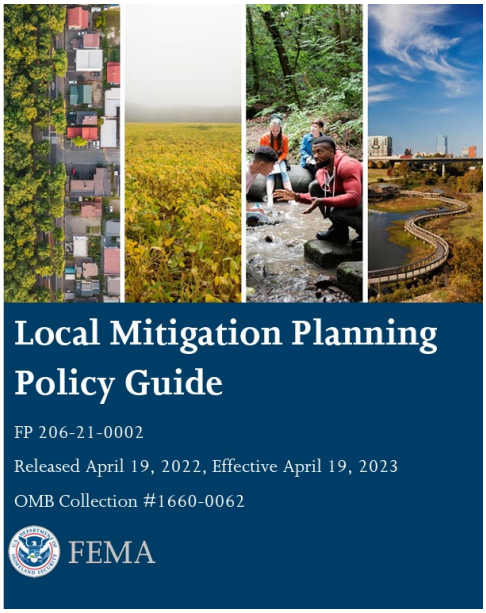
[1] California Governor's Office of Emergency Services. 2017. State of California Emergency Plan. https://www.caloes.ca.gov/wp-content/uploads/Preparedness/Documents/California_State_Emergency_Plan_2017.pdf

[2] Rodin, J. 2014. The Resilience Dividend: Managing Disruption, Avoiding Disaster, and Growing Stronger in an Unpredictable World. New York: Public Affairs.

collaboration between the City, other public agencies, local employers, service providers, community members, and other key stakeholders.

Federal Authority

The City is not required to prepare an LHMP, but state and federal regulations encourage it. The federal Robert T. Stafford Disaster Relief and Emergency Act, amended by the Disaster Management Act of 2000, creates a federal framework for local hazard mitigation planning. It states that jurisdictions that wish to be eligible for federal hazard mitigation grant funding must prepare a hazard mitigation plan that meets a particular set of guidelines and submit this plan to the Federal Emergency Management Agency (FEMA) for review and approval. These guidelines are outlined in the Code of Federal Regulations, Title 44, Part 201, and discussed in greater detail in FEMA's Local Mitigation Plan Review Tool.



FEMA's Local Mitigation Planning Policy Guide

This guide provides the official policy and interpretation of the applicable statutes and mitigation planning regulation in 44 Code of Federal Regulations.

State Authority

California Government Code Sections 8685.9 and 65302.6

California Government Code Section 8685.9 (also known as Assembly Bill 2140) limits the State of California's share of disaster relief funds paid out to local governments to 75 percent of the funds not paid for by federal disaster relief efforts unless the jurisdiction has adopted a valid hazard mitigation plan consistent with the Disaster Management Act of 2000 and has incorporated the hazard mitigation plan into the jurisdiction's general plan. The State may cover over 75 percent of the remaining disaster relief costs in these cases.

All cities and counties in California must prepare a general plan, including a safety element that addresses various hazard conditions and other public safety issues. The safety element may be a stand-alone chapter or incorporated into another section, as the community wishes. California Government Code Section 65302.6 indicates that a community may adopt an LHMP into its safety element if the LHMP meets applicable state requirements. This allows communities to use the LHMP to satisfy state requirements for safety elements. As the General Plan is an overarching long-term plan for community growth and development, incorporating the LHMP into it creates a stronger mechanism for implementing the LHMP.

California Government Code Section 65302 (g)(4)

California Government Code Section 65302 (g)(4), also known as Senate Bill (SB) 379, requires that the safety element of a community's general plan address the hazards created or exacerbated by climate change. The safety element must identify how climate change is

expected to affect hazard conditions in the community and include measures to adapt and be more resilient to these anticipated changes.

Because the LHMP can be incorporated into the safety element, including these items in the LHMP can satisfy the state requirement. SB 379 requires that climate change be addressed in the safety element when the LHMP is updated after January 1, 2017, for communities that already have an LHMP or by January 1, 2022, for communities without an LHMP.

This LHMP is consistent with current standards and regulations, as outlined by the California Office of Emergency Services (Cal OES) and FEMA. It uses the best available science, and its mitigation actions/strategies reflect best practices and community values. It meets the requirements of current state and federal guidelines and makes the City eligible for all appropriate benefits under state and federal law and practices. Note that while FEMA is responsible for reviewing and certifying this LHMP, and Cal OES is responsible for conducting a preliminary review, it does not grant FEMA or Cal OES an increased role in the governance of the city or authorize either agency to take any specific action in the community.

Plan Organization and Use

The Needles LHMP is both a reference document and an action plan. It has information and resources to educate readers and decision-makers about hazard events and related issues and a comprehensive strategy that the City and community members can follow to improve resilience in the city. It is divided into the following chapters:

- **Chapter 1: Introduction.** This chapter describes the Plan's background, its goals and objectives, and the process used in its development.
- **Chapter 2: Community Profile.** This chapter discusses Needles' history, physical setting, land use, demographics, and other important community characteristics.
- **Chapter 3: Hazard Assessment.** This chapter identifies and describes the hazards that threaten Needles and discusses past and future events and the effects of climate change.
- **Chapter 4: Vulnerability Assessment.** This chapter describes each hazard's threat to Needles' key facilities and community members, including socially vulnerable individuals.
- **Chapter 5: Mitigation Strategy.** This chapter lists the mitigation actions to reduce Needles' vulnerability to hazard events and provides an overview of the community's existing capabilities to improve hazard resilience.
- **Chapter 6: Plan Maintenance.** This chapter summarizes implementing, monitoring, and updating the LHMP and opportunities for continued public involvement.

Previous Needles LHMP

This is an update to the City of Needles' 2019 LHMP, which will reinstate the City's eligibility, once approved and adopted by the City Council, to apply for FEMA grants for hazard mitigation projects and monetary relief during emergency situations. The content from the previous plan

has been included in this document and updated accordingly. Key modifications in this plan focus on expanding the risk assessment (understanding potential losses and vulnerable populations) within **Chapter 4** and revised and modified mitigation strategies and actions within **Chapter 5**.

Key updated elements from the previous Needles LHMP include the following:

- Updated Plan Goals
- Integration of the General Plan, Housing Element, Safety Element, and Climate Adaptation Vulnerability Assessment into the Community Profile, Hazards Assessment, and Vulnerability Assessment chapters of the plan
- Expanded historic events discussions within the plan
- Updated Capabilities Assessment
- Updated Mitigation Actions and Strategies, including progress on previous actions

Previous Plan Integration

The previous LHMP has not been incorporated or integrated into any of the City's planning policies and documents. To ensure future integration occurs, **Chapter 6** of this plan includes additional guidance on how to best integrate the LHMP into the General Plan Safety Element, Emergency Operations Plan, and other planning mechanisms used by the City.

Disaster Declaration Connections

Since 2018, the following major disasters, emergency declarations, and fire management events (**Table 1-1**) have been issued by the FEMA. Past events identified in this plan have been identified in connection with these events in the "Past Events" sections within each Hazard Profile located in **Chapter 3** of this Plan. If no event has been identified in a hazard profile in Chapter 3, that indicates that a disaster declaration has not been declared for that hazard type.

Table 1-1: Disaster Declaration – San Bernardino County (2018-2023)

Year	Declaration Number	Declaration Title	Incident Type	Affected the City	Activated EOC or Requested PA
2023	DR-4699-CA	SEVERE WINTER STORMS, STRAIGHT-LINE WINDS, FLOODING, LANDSLIDES, AND MUDSLIDES	Severe Storm	No	No
2023	EM-3591-CA	SEVERE WINTER STORMS, FLOODING, AND MUDSLIDES	Flood	No	No
2023	EM-3592-CA	SEVERE WINTER STORMS, FLOODING, LANDSLIDES, AND MUDSLIDES	Flood	No	No
2021	DR-4569-CA	WILDFIRES	Fire	No	No

2021	FM-5381-CA	BLUE RIDGE FIRE	Fire	No	No
2020	DR-4482-CA	COVID-19 PANDEMIC	Biological	Yes	No
2020	EM-3428-CA	COVID-19	Biological	Yes	No
2020	FM-5350-CA	EL DORADO FIRE	Fire	No	No
2020	FM-5325-CA	APPLE FIRE	Fire	No	No
2020	FM-5301-CA	HILLSIDE FIRE	Fire	No	No
2019	EM-3415-CA	EARTHQUAKES	Earthquake	No	No

DR = Major Disaster
EM = Emergency Declaration
FM = Fire Management

Plan Goals

This plan was developed to increase resilience in Needles broadly, relying on the following revised goals.

This Plan was developed to broadly increase resilience in Needles. The following goal is from the 2011 LHMP:

1) Reduce damage and injuries from future hazards.

During the planning process, the Hazard Mitigation Planning Committee (HMPC) identified these new goals to replace the previous goals:

1) Protect against threats from natural hazards to life, injury, and property damage within the Needles community.
2) Increase public awareness of potential hazard events.
3) Preserve critical services and functions by protecting key facilities and infrastructure for the community.
4) Protect natural systems from current and future hazard conditions.
5) Coordinate mitigation activities among City departments, neighboring jurisdictions, and federal agencies.
6) Prepare for long-term change in hazard conditions associated with climate change.

Planning Process

State and federal guidance for LHMPs does not require that jurisdictions follow a standardized planning process. FEMA encourages communities to create a planning process that reflects local values, goals, and characteristics. FEMA does suggest a general planning process that follows the steps identified below:

The planning process used to create this plan for the City of Needles is described as follows:

Hazard Mitigation Planning Committee

The City established a Hazard Mitigation Planning Committee (hereafter referred to as the HMPC). The HMPC comprises representatives from key city departments and stakeholders from local and regional agencies and companies that are key to hazard mitigation activities. **Table 1-2** identifies the members who were invited and/or attended HMPC meetings.

Table 1-2: Needles Hazard Mitigation Planning Committee (HMPC)

Name	Title	Department
Kathy Raasch	Interim Development Services Director	Development Services
Rainie Torrance	Utility Manager	Needles Public Utility Agency
Irene Romero	City Planner	Planning
Jennifer Valenzuela	Recreation Services Manager	Parks & Recreation
Cheryl Sallis	Community Services Manager	Community Services Department
Will Guzman	Building Inspector	Building & Safety
Adrian Chavez	Senior Code Enforcement	Code Enforcement
Steve Ledbetter	Contract City Engineer	Engineering
Angelica Deermer	Housing Manager	Needles Housing Authority Manager
Aaron Pfannenstiel	LHMP Project Manager	Atlas Planning Solutions
Crystal Stueve	LHMP Planner	Atlas Planning Solutions
Robert Jackson	LHMP Planner	Atlas Planning Solutions

The HMPC held two meetings throughout the plan development process to lay out the methods and approach for the Plan, draft and review content, make revisions and engage members of the public.

- **HMPC Meeting #1 (July 31, 2024):** The HMPC members confirmed the project goals and responsibilities. They revised the community engagement and outreach strategy, confirmed and prioritized the hazards included in the Plan, and identified critical threat assessment facilities.
- **HMPC Meeting #2 (November 25, 2024):** The HMPC discussed and reviewed mitigation actions and strategies, made revisions, and assigned priorities.

Invitations and materials for meetings were provided via email. **Appendix A** contains copies of invitations, meeting agendas, sign-in sheets, and other relevant materials distributed for these meetings.

Public Engagement

Under FEMA guidelines, local hazard mitigation planning processes should create opportunities for the public to be involved in plan development—at a minimum, during the initial drafting stage and plan approval. Due to the policy changes in the post-COVID-19 pandemic world, in-person public workshops and meetings were replaced with virtual workshops, meetings, and discussion groups for health and safety reasons. A listing of several key activities of the LHMP follows.

Stakeholder Engagement

As part of the plan update process, the City invited stakeholders to review and comment on the Public Review Draft of the LHMP. These stakeholders included neighboring jurisdictions, utility providers, local school districts, energy producers, water districts, and County agencies. Information regarding this engagement opportunity can also be located in **Appendix B**. All jurisdictions and stakeholders were invited via email and/or direct communication via telephone. The following is a list of those stakeholders invited to participate in the plan development process and review.

- Colorado River Medical Center
- Fort Mohave Indian Tribe
- Mohave County Public Works
- Needles Chamber of Commerce
- Needles Regional Museum
- Needles Unified School District
- San Bernardino County Fire Protection District
- San Bernardino County Sheriff's Department
- St. Vincent De Paul Society
- Tri-State Community Healthcare

Vulnerable Populations Outreach

Based on demographics, the City recognizes that a large segment of Needles residents live below the poverty limit. Needles also has a significant number of residents older than 65 years of age in the city, which should be considered in the planning process. Additionally, those primarily speaking another language may be more linguistically isolated than in other parts of the county.

To address vulnerable population needs as part of outreach and engagement during the planning process, the City sent out a utility flyer insert. The flyer provided information regarding the LHMP planning process and provided links to access the survey and other engagement opportunities.

The purpose of this contact was to inform the residents in these locations about the LHMP update and provide an opportunity to participate in the planning process. Residents were invited to review the public review draft LHMP and provided access to an online form to submit feedback.

Future Outreach Opportunities

Recognizing that other vulnerable populations do exist in the city, this update focused on the one of greatest concern. For the next update, the City plans to enhance outreach efforts to daily workers who are employed within the city but reside elsewhere. The goal is to ensure these individuals are better informed about potential risks and challenges that may affect their well-being.

Public Engagement Opportunities

The City regularly conducts community meetings and events intended to provide useful information to participants/ attendees. In-person engagement opportunities were a central component of the City's engagement efforts. These meetings allowed members of the public to learn about the hazards of concern identified by the HMPC during this update. Atlas Planning Solutions and City staff presented the LHMP planning process and relevant information at one public engagement meeting early on in the process. Additionally, City staff advertised the public survey at various public events and through e-blasts and alerts shared throughout the city.

- **December 12, 2024** – Public Outreach Workshop: The City's consultant, Atlas, Planning Solutions, presented the City of Needles 2025 Local Hazard Mitigation Plan Update Project and planning process to the residents of the city as a part of the public outreach process. There were 12 residents in attendance. In addition to answering questions and feedback, a QR code linked to a comment card was shared to record feedback from attendees.

Appendix B includes a copy of the materials shared at the outreach meeting.

ONLINE ENGAGEMENT

The City recognized that not all community members can attend public meetings and conducted public engagement through social media and online platforms.

The City promoted the planning process through the following online methods:

- Online survey
- Needles Connect e-blast
- City of Needles website

LHMP Project Webpage

The City created a page on the City's website dedicated to the Local Hazard Mitigation Plan development to reach a broad audience and increase public engagement and participation. The webpage is a simple, one-stop location where community members can learn about the LHMP. The webpage explains what an LHMP is, why the City should have one, how it is developed, and how the public can participate in the planning process. It also includes a link to the LHMP survey described in the next section.

The webpage can be found at https://cityofneedles.com/wp-content/uploads/2024/05/Project-Website-Content.pdf.

Online Survey

The City released an online survey to community members to gather feedback on the planning process and hazards of concern. The City received 96 responses from community members and stakeholders during the survey period. Responses were received from all zip codes and areas within Needles, ensuring the entire city was represented geographically. Based on these responses, the following information was shared with the City:

- About 72% of respondents live in the City of Needles, while approximately 18% of respondents live *and* work in the City of Needles.
- According to respondents, the top (4) hazards of concern for the city are Extreme Heat, Hazardous Materials Incident, Dam Failure, and Drought. These responses confirmed that the concerns identified by City staff during the planning process were similar to those of residents who responded to the survey.
- Approximately 59% of respondents are concerned about how climate change may create new hazardous situations in the city or could make existing natural hazards worse.
- Approximately 39% of respondents believe climate change already threatens their health, property, livelihood, and overall well-being.
- Approximately 41% of respondents are familiar with the special needs of their neighbors in the event of a disaster situation (special needs may include limited mobility, severe medical conditions, or memory impairment).

As part of the outreach strategy, a QR code was created for promotional materials and handouts at fairs and booths used by City staff at community events. This QR Code provided quick access to the City's online survey.

The results from the survey were provided to the HMPC. The data was then analyzed, reviewed, and incorporated by the HMPC within the LHMP content. The data provided by the survey presented unique local insight into hazard concerns and assessed the public's overall opinion and perception of the hazards that affect Needles. The survey results are also provided in **Appendix B** of the LHMP, including the survey questions and answers.

Social Media Outreach

The City promoted and provided information on the Hazard Mitigation Survey and the LHMP Public Review Draft on multiple social media platforms.

- City of Needles – LinkedIn account with 133 followers
- City of Needles YouTube account with 129 subscribers

PUBLIC REVIEW DRAFT

On June 11, 2025, the City released a draft copy of the LHMP for public review and comment. To ensure public access and awareness, the City distributed notifications about the Public Review Draft of the 2025 LHMP through multiple channels:

- **City Website:** A public notice announcing the draft comment period was posted on the City's official website. The notice included information on where the draft could be accessed both online and in person.
- **Public Viewing Locations:** Printed copies of the draft and the notice were made available at City Hall and at the El Garces Center, where public hearings were scheduled.
- **Newspaper Publication:** A public notice was published in the *Desert Sun*, the local newspaper, to reach a wider audience within the community.
- **Direct Stakeholder Outreach:** The City also directly emailed each identified stakeholder with a copy of the Draft 2025 LHMP. The email included information on the review process, how to submit comments, and the timeline for public input.

The Public Review Draft period extended from June 11, 2025, through July 11, 2025.

PLAN REVISION AND ADOPTION

The City received one response from a stakeholder on the plan during the public review period; however, the response didn't require any edits or modifications to the plan content or major revisions. Following public comment, the City submitted the plan to Cal OES and FEMA, initiating their review process. Upon completing this review process, City staff transmitted the final plan to the City Council for final adoption. The Needles City Council adopted the final LHMP on [Month, Day, 2024]. **Appendix C** contains a copy of the adoption resolution.

Plan Resources

The City referred to several plans, studies, technical reports, datasets, and other resources to prepare the Plan's hazard assessment, mapping, threat assessment, and other components. **Table 1-3** provides some of the HMPC's primary resources to prepare this Plan.

TABLE 1-3: KEY RESOURCES FOR PLAN DEVELOPMENT		
Section	**Key Resources Reviewed**	**Data Incorporated from Resource**
Multiple	• Cal-Adapt • California Department of Conservation • California Geological Survey • California Office of Emergency Services • California State Hazard Mitigation Plan • City of Needles General Plan • FEMA Local Hazard Mitigation Plan Handbook • National Oceanic and Atmospheric Administration • National Weather Service • US Geological Survey • US Census Bureau 2018-2022 American Community Survey • San Bernardino County Vulnerability Assessment • San Bernardino County Hazard Mitigation Plan	• Science and background information on different hazard conditions • Records of past disaster events in and around Needles • Current and anticipated climate conditions in and around Needles • Projections of future seismic conditions and events
Community Profile	• US Census Bureau 2018-2022 American Community Survey • California Energy Commission	• Demographic information for Needles and San Bernardino County • History of the region • Economic trends in Needles • Commute patterns in Needles • Local land-use patterns • Background information on utilities serving Needles • Current Climate information in Needles
Hazard Assessment		
Dam Failure	• California Department of Water Resources • San Bernardino County Flood Control District • US Army Corps of Engineers	• Mapping of dam failure inundation areas • Profiles and conditions of dams in and around Needles
Flood	• FEMA Map Service Center • San Bernardino County Flood Control District	• Records of past flood events in and around Needles • Locations of flood-prone areas in Needles

Hazardous Materials Release	• Department of Toxic Substances and Control • Environmental Protection Agency • Cal OES Spill Reporting Database	• Location and dates of past hazardous materials release • Effects of hazardous materials release
Human-Caused Hazards – Cyber Threat	• Cyber Security Index	• Rate of Cyber Attacks over a period of time
Human-Caused Hazards – Transportation Accidents	• National Transportation Safety Board (NTSB)	• Records of past transportation accidents
Seismic and Geologic Hazards	• Southern California Earthquake Data Center • The Third California Earthquake Rupture Forecast (UCERF3) • California Geological Survey	• Location of fault zones • Records of past earthquakes • Probability of future earthquake events • Location of seismically vulnerable areas
Severe Weather	• Cal Adapt • California Department of Water Resources • US Drought Monitor • Western Regional Climate Center •	• Historic drought information • Current drought conditions • Science and background information on extreme weather events • Historical record of extreme weather events in and around Needles
Wildfire	• California Department of Forestry and Fire Prevention • Fire and Resource Assessment Program	• Records of past fire events • Location of fire hazard zones in and around Needles
Note: Sections not individually identified in this table relied primarily on sources identified in multiple sections.		

CHAPTER 2 –
COMMUNITY PROFILE

The Community Profile section of the LHMP describes Needles, including information about the community's physical setting, history, economy and demographics, current and future land uses, and key infrastructure. The Community Profile helps establish the baseline conditions in Needles, which informs the development of the hazard mitigation strategies and actions in **Chapter 5**.

Setting and Location

The City of Needles is located within the Mojave Desert in eastern San Bernardino County, CA. The city sits along the western bank of the Colorado River, near the Arizona border. Needles covers approximately 30 square miles and sits at an elevation of 488 feet. The city is accessible via Interstate 40 and U.S. Route 95.

The city is in a desert environment and experiences temperature extremes. The temperatures range from 40-80 degrees Fahrenheit in winter, autumn, and spring. The temperatures are typically above 100 degrees in the summer but may exceed 120 degrees on extreme days. The city experiences an average of 310 sunny days yearly, compared to the national average of 205. Precipitation averages 4.7 inches per year, with an equal amount falling during the monsoon season (summer) and winter. When precipitation occurs, it tends to be in the form of a cloudburst. It rains so hard that the soil becomes inundated and cannot absorb the water, leading to flash flooding.

History

Founded in 1883, Needles is one of the oldest cities in San Bernardino County. The city was incorporated on October 30, 1913, and became a charter city on January 28, 1959. Located in the heart of the lower Colorado River recreation area just across the bridge from Arizona and just minutes to Nevada (the “Tri-State” area), Needles is the gateway to the Golden State.

The Needles Eye newspaper office, circa the late 1890s. Photo provided by the City of Needles.

The Aha Macav (now federally designated as the Fort Mojave Indian Tribe) has managed their desert homeland's natural resources for as long as 8,000 years. There is evidence to suggest that the ancestors of today’s Mojave people migrated into the mountains and valleys along the Colorado River soon after the last ice age.

In 1776, Father Francisco Garces was the first white man to visit the homeland of the Mojave. The United States Army established Camp Colorado (later changed to Ft. Mojave) on the east side of the Colorado River in 1859 to protect settlers migrating west.

In 1883, the first railroad crossed the Colorado River from Topock in Arizona Territory to the present site of Needles. The town of Needles was formed at that time. Needles became a regular stop for the Santa Fe Railroad and served as an icing station for the fruits and vegetables shipped east from California's fields and orchards. Today, Needles remains an important part of the backbone of America's shipping – the railroad.

Demographics

The data used in this section comes from the most comprehensive American Community Survey 2017 – 2022 (ACS), administered by the United States Census Bureau (U.S. Census) completed in 2022, and the California Department of Finance (DOF). Based on this dataset, Needles' projected population is 4,931, with a median age of 48.8. This median age is approximately 14.9 years older than the average median age in San Bernardino County (33.9). The percentage of children under the age of 10 is lower (8.6%) than the rest of San Bernardino County, which is 13.6%. The percentage of senior residents (aged 65 and older) in the city is 21.6%, which is significantly higher than the rest of San Bernardino County (11.9%). Needles residents have a lower median income than the rest of San Bernardino County. In addition, a higher proportion of Needles' residents rent their homes (42.4%) than the rest of San Bernardino County residents (38.9%).

Table 2-1 identifies the basic demographics for Needles and San Bernardino County according to the 2022 ACS 5-year projections. Note that these statistics may vary from the demographic information in **Chapter 4**, Threat Profiles, as that data set comes directly from ESRI's Business Analyst Tool.

TABLE 2-1: BASIC DEMOGRAPHICS—NEEDLES & SAN BERNARDINO COUNTY

Demographic	Needles	San Bernardino County
Total Population	4,931	2,180,563
Percent of children who are less than 10 years old	8.6%	13.6%
Percent of residents who are senior citizens (65+)	21.6%	11.9%
Median Age	48.8	33.9
Total households	2,016	659,928
Median household income	$38,368	$77,423
Percent of rental households	42.4%	38.9%

Sources: American Community Survey (2017-2022), ACS 2022 5-Year Projections
* 2022 Census projections identify an estimated population of 4,900 which is used in Chapter 4 of this plan.

Regarding its racial and ethnic composition, Needles is a white-majority city, with 67.4% of all Needles residents identifying as white. According to the ACS, this population makeup differs from San Bernardino County, where most of the population identify as Hispanic or Latino. **Table 2-2** shows the racial and ethnic composition of all Needles and San Bernardino County groups.

Needles residents have attained lower education levels than San Bernardino County residents. For example, a lower percentage of the city's population has earned a bachelor's degree (7.0%) compared to the rest of San Bernardino County (14.5%). Similarly, a lower percentage of the city has attained a graduate or professional degree (2.7%) compared to San Bernardino County (8.5%). However, more residents in Needles have a high school diploma or equivalent (33.7%) compared to San Bernardino County residents (28.7%). **Table 2-3** shows all levels of educational attainment of residents 25 years of age or older in both Needles and San Bernardino County, according to the American Community Survey as of 2022.

TABLE 2-2: DETAILED DEMOGRAPHIC BREAKDOWN—NEEDLES & SAN BERNARDINO COUNTY

Race or Ethnicity	Needles		San Bernardino County	
	Population	Percentage	Population	Percentage
White	3,322	67.4%	975,461	44.7%
Black	121	2.5%	171,762	7.9%
American Indian and Alaskan Native	445	9.0%	25467	1.2%
Asian	60	1.2%	169,063	7.8%
Native Hawaiian and Other Pacific Islander	12	0.2%	7,333	0.3%
Some Other Race Alone	415	8.4%	484,024	22.2%
Two or more races	556	11.8%	347,453	15.9%
Hispanic or Latino (of any race) *	1,255	25.5%	1,200,147	55.0%
Total	**4,931**	**100%**	**2,180,563**	**100%**

* The US Census Bureau does not currently count persons who identify as Latinx as a separate racial or ethnic category. Persons who identify as Hispanic or Latinx are already included in the other racial or ethnic categories

Note: Percentage values are rounded to the nearest tenth decimal.

Source: U.S. Census Bureau, 2022 American Community Survey (ACS) – Needles and San Bernardino County

TABLE 2-3: EDUCATIONAL ATTAINMENT OF RESIDENTS 25+ YEARS OF AGE

Educational Attainment	Needles		San Bernardino County	
	Number	Percentage	Number	Percentage
Less than 9th grade	154	4.2%	129,465	9.2%
9th grade to 12th grade (no diploma)	595	16.3%	124,445	8.8%
High school graduate or equivalent	1,230	33.7%	405,744	28.7%
Some college (no degree)	1,107	30.3%	311,528	22.1%
Associate's degree	207	5.7%	115,913	8.2%
Bachelor's degree	256	7.0%	205,233	14.5%
Graduate or professional degree	100	2.7%	119,723	8.5%
Total	**3,649**	**100%**	**1,412,051**	**100%**

Note: Percentage values are rounded to the nearest tenth decimal.

Source: U.S. Census Bureau, 2022 American Community Survey (ACS) – Needles and San Bernardino County

Needles has a wide range of non-English languages spoken at home among its residents, with varying proficiency levels. Generally, Spanish is the second most spoken language in Needles, with approximately 17.5% of the population speaking English less than "very well." Asian and Pacific Islander languages are Needles' third most spoken language category, with 89.7% of the population speaking English less than "very well." This is similar to populations in San Bernardino County, where Spanish is the second most spoken language and Asian and Pacific Islander is the third most spoken language category. **Table 2-4** shows the most spoken languages and the levels of fluency among speakers aged five years and older in Needles and San Bernardino County, according to the ACS.

TABLE 2-4: ENGLISH PROFICIENCY AND LANGUAGES SPOKEN AT HOME AMONG RESIDENTS AGED 5+ YEARS

Languages	Needles			San Bernardino County		
	Number of speakers	Speak English "less than very well"	% not fluent in English	Number of speakers	Speak English "less than very well"	% not fluent in English
English only	4,184	_	_	1,153,879	--	--
Spanish	435	76	17.5%	723,044	237,418	32.8%
Indo-European*	6	0	0%	29,093	7,283	25.0%
Asian and Pacific Islander*	29	26	89.7%	109,024	50,873	46.7%
All other languages	55	2	3.6%	20,594	6,700	32.5%
Total	**4,709**	**106**	**110.8%****	**2,035,634**	**302,274**	**34.3%****

*Census data does not breakdown the specific languages for languages spoken in these regions.
**Due to these figures only being a percentage of the overall number of speakers, they will not add up to 100%.
Source: U.S. Census Bureau, 2022 American Community Survey (ACS) – Needles and San Bernardino County

Economy and Commute Patterns

Needles has a diverse economy of employers from various sectors, including agriculture, public administration, healthcare, and education, with a total employment base of 2,804 jobs for employees. Some of the city's top employers include Burlington Northern Santa Fe Railroad, Colorado River Medical Center, Needles Unified School District, and various entities in the cannabis industry. **Table 2-5** shows the top ten employment sectors in Needles, according to the City's 2022-2025 Marketing Plan.

As of 2022, over 1,700 Needles residents are employed, with approximately 477 (28.1%) working within the city. The remaining workforce commutes from surrounding cities throughout the region. **Table 2-6** shows the top five cities contributing to Needles' workforce, accounting for approximately 62.2% of those employed within the city.

TABLE 2-5: EMPLOYMENT BY INDUSTRY IN NEEDLES		
Industry	**Number of Jobs**	**Percentage of Total City Employment**
Public Administration	533	19.0%
Agriculture – Cannabis-related	509	18.2%
Health Care and Social Assistance	359	12.8%
Arts/Entertainment/Recreation	351	12.5%
Education	329	11.7%
Retail	219	7.8%
Other Services	131	4.7%
Real Estate & Rental/Leasing	64	2.3%
Transportation & Warehousing	60	2.1%
Construction	49	1.7%
Total	**2,275**	**92.8%**

Source: City of Needles, CA Marketing Plan 2022-2025
Percentage rounded to the nearest tenth percentage.

TABLE 2-6: TOP FIVE CITIES-OF-ORIGIN FOR NEEDLES' WORKFORCE (2021)		
City of Origin	**Number of Employees**	**Percentage**
Needles, CA	477	33.1%
Lake Havasu City, AZ	166	11.5%
Mohave Valley, AZ	91	6.3%
Fort Mohave, AZ	83	5.8%
Bullhead City, AZ	79	5.5%
Total	**689**	**62.2%**

Source: https://onthemap.ces.census.gov/

While most Needles' residents commute outside the city for work, most commuting residents (47.1%) travel between 50 miles or greater to reach their place of employment—most of those trips heading into the Los Angeles or San Bernardino areas. The city has convenient access to Amtrak at the El Garces Intermodal Transportation Facility and highway and interstate access with routes connecting to Barstow, Kingman, and Las Vegas. **Table 2-7** shows the outflow of workers from Needles to other regional worksites.

TABLE 2-7: WORK COMMUTE DISTANCES FOR NEEDLES RESIDENTS (2021)		
Work Destination	**Number of Employees**	**Percentage**
Less than 10 miles	594	36.9%
10 to 24 miles	160	10.0%
25 to 50 miles	97	6.0%
Greater than 50 miles	757	47.1%
Total	**1,608**	**100%**
Source: https://onthemap.ces.census.gov/		

Development Trends

Needles is located within a somewhat isolated part of eastern San Bernardino County. From 2010 to 2021, the city's population increased from 4,844 to 5,353 (approximately 10.5%). Growth forecasts prepared by the Southern California Association of Governments (SCAG) estimate that Needles' population could surpass 6,000 people sometime between 2020 and 2035. At this rate, the population is expected to grow by less than 1 percent per year. Since 2019, the City has experienced a decrease in housing stock, from 2,897 (2019) to 2,867 (2021). The loss of housing units by fire and no new units being built in over a decade has contributed to the city's decrease in housing stock. Additionally, a decrease could also be contributed to units originally classified as residential converted for commercial use. Of the approximately 2,867 residential units within the City, 69.3% are single-family, 16.9% are multi-family, and 13.7% are mobile homes. In Needles, 25.3 percent of housing is less than 30 years old, and nearly 75 percent is at least 30 years old. In other words, almost 8 in 10 homes in Needles most likely require some degree of repair. **Figure 2-1** shows land use and zoning for the city.

According to the 2021-2029 City of Needles Housing Element, the City has a state-mandated regional housing needs allocation (RHNA), residential development requirement, and housing allocation of 87 units. The RHNA process is part of the Housing Element Law used to determine how many new homes and the affordability of those homes each local government must plan for in its Housing Element. Currently, the city has ample vacant sites and zoned land to meet and exceed the RHNA. The City has other strategies outlined in the Housing Programs section of the 2021-2029 Housing Element, which can be accessed on the City of Needles website here.

Vulnerability and Risk Reduction

All new development and redevelopment occurring in the amended zoning areas will provide the city with hazard vulnerability and risk reduction. This reduction will occur due to the anticipated improvements and investments implemented in these older parts of the city due to these amendments to the General Plan and zoning regulations. In addition, the new developments that will be built will comply with the most up-to-date building codes and use the latest techniques, further reducing vulnerabilities throughout the city.

Major Community Components

El Garces Historic Train Depot

El Garces Train Depot is a historic freight and passenger depot in Needles, along Route 66. Opened in 1908, the train depot was built to model a Greek temple and included a hotel and restaurant amenities. The depot was named after Father Francisco Garces, the first European to cross the Mojave Desert. As automobile travel became more accessible to people with a wider range of incomes, who often could afford to travel but not to dine or stay at a place as elegant as El Garces, El Garces closed in 1949, at which time the building was partitioned and used as Santa Fe Railway offices. In 1988, the Santa Fe Railroad moved to another facility and closed the building. Abandoned, El Garces was under threat of destruction until 1993, when a local group called Friends of El Garces formed and petitioned the City to purchase the station. In 1999, the City of Needles purchased El Garces. The National Park Service recognized the building's significance in 2002 by listing it in the National Register of Historic Places. In 2014, the facility opened as an Intermodal Transportation Facility. In 2016, Amtrak opened a dedicated waiting room for passengers. A room is also available for community events in what was formerly the luggage room.[3]

Colorado River

The Colorado River runs along the easter portion of the city. Along the river are sandy beaches and waterfront campgrounds. People travel from neighboring states for boating and various other water activities that can be enjoyed on the Colorado River.

Moabi Regional Park

Located along the banks of the Colorado River, at the California and Arizona state lines, Moabi is the place where people can enjoy water recreation and beautiful scenery. Moabi Regional Park Campground offers a mix of group/tent camping and dedicated campsites. Fishing, hiking, boating, and off-road driving are popular activities in Moabi. The Pirate Cove Resort, a hot spot popular among boaters and RVers, operates the park.[4]

Infrastructure Assessment

Infrastructure plays a vital role in mitigating the effects of hazard events. When infrastructure fails, it can exacerbate the effects of a hazard event or create complications for rescue workers trying to reach victims. For example, fallen utility poles resulting from strong winds or seismic activity can obstruct roadways and prevent emergency vehicles from reaching affected areas. The following are Needles' electrical, gas, water and wastewater, and infrastructure transportation networks.

[3] National Park Service. California: El Garces. https://www.nps.gov/places/el-garces.htm

[4] San Bernardino County Regional Parks. Moabi Regional Park. https://parks.sbcounty.gov/park/moabi-regional-park/

Electricity Service

Through the Needles Public Utility Authority (NPUA), the City owns and operates the electric utility. The electric system expands from the Nevada state line, south of Laughlin, Nevada, to Topock, Arizona. Needles' peak electric demand is 26.72 MW (as of July 2024), serving approximately 3,000 customers. The Western Area Power Administration (WAPA) delivers energy to the City of Needles on a 69KVA transmission line. The distribution line crosses the river in town at 3240 Needles Hwy, the firehouse switchyard. The City of Needles also has a back 69KVA Line from the Nora McDowell Substation located 15 miles north of Needles. The electric department is under direct supervision from the Utility Manager and City Manager; there is one Power Line Supervisor, two power line technicians, and three apprentice linemen.

The threat of wildfires in California is real and growing. One critical tool used to prevent wildfires is the Public Safety Power Shutoff (PSPS) circuits, in which power providers may temporarily shut off power to circuits during dangerous weather conditions to prevent their electric system from becoming a source of ignition, resulting in a wildfire. These safety shutoffs are a measure of last resort for keeping residents and the community safe. Although no part of the Electric Company's service territory is located in the California Public Utilities Commission High Fire Threat Districts, and there have been no PSPS events in the city, the NPUA has the authority to conduct a PSPS event if fire-threat conditions occur.[5]

Natural Gas

The Southwest Gas Company provides natural gas to Needles and surrounding jurisdictions. Southwest Gas owns and operates transmission lines throughout San Bernardino County to ensure sufficient natural gas throughout the region. If these lines are damaged, there is potential for interrupting natural gas flow and delivery throughout the region. Additionally, natural gas ignites easily. Any rupture in a transmission line could cause additional damage to properties near the leak due to fire from the escaped natural gas. The presence of this infrastructure creates unique challenges for the city from an emergency management perspective. Including hazards associated with damage to this infrastructure is an important element of an effective response to future incidents involving natural gas use and transmission.

Water Service

The City of Needles Water Department provides water to its residents and other customers. Groundwater is the source of Needles' water supply. Approximately 781 million gallons per year are pumped from four wells. The wells are approximately 100 feet deep. The water distribution system consists of 66 miles of lines varying from 2" to 16" in diameter. Water storage capacity for the Needles water supply is provided by two 1.5 million gallon tanks for the lower pressure zone, one 1.5 million gallon tank, and one 100,000 gallon tank for the upper pressure zone. Drinking water standards are established by the State Water Resource Control Board and the United States Environmental Protection Agency (EPA) in compliance with the Safe Water

[5] Needles Public Utility Authority Wildfire Mitigation Plan. 2023. https://cityofneedles.com/wp-content/uploads/2023/06/NPUA-Wildfire-Mitigation-Plan-2023-4.0.pdf

Drinking Act. The City follows these standards and publishes them yearly in its Consumer Confidence Report.[6]

Wastewater Treatment

The City's Wastewater Department is responsible for managing the City's sanitary sewer collection system. The field operation and maintenance services are fulfilled by City staff. The collection system consists of 19.25 miles of sewer line, 3.6 miles of Force Main, 4 lift stations, 390 manholes, and a 1.2 mgd wastewater treatment plant (WWTP). The sewer system was first installed in 1950. The City has four lift stations. Once reaching the WWTP, the effluent water is pumped to the City's Percolation Ponds. Here, the water percolates back into the ground and starts the life cycle all over again. The City receives Colorado River recharge credits for all water percolated back into the ground from the effluent. In Needles, the last of the sewer service on the south side goes as far as Victory Drive & Cherry; on the north side, it goes to Pashard Ave. Needles has several septic systems, mostly in North Needles along the Colorado River.[7]

Transportation System

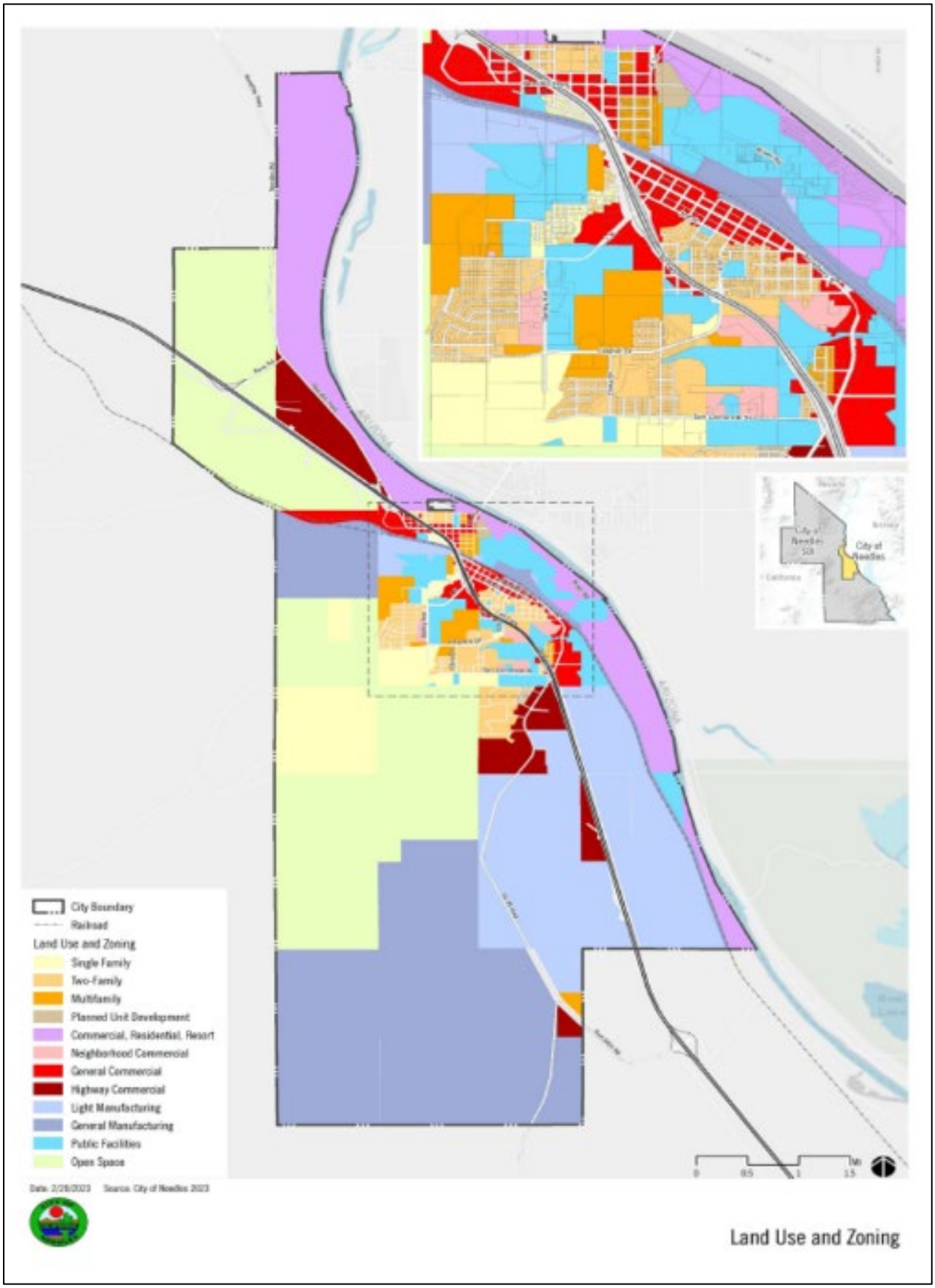
Private automobiles are the dominant means of transportation in Southern California and the City of Needles. However, the City of Needles meets its public transportation needs through the Needles Area Transit (NAT). In addition to route service in and around Needles, the NAT provides the following services:

- **Dial-A-Ride:** Provides specialized, curb-to-curb transportation for seniors (55+) and persons with disabilities within the City of Needles.
- **Medical Transportation:** Provides all Needles residents with medical transportation to Valley View Medical Center or Bullhead City Medical Facilities.
- **Shopper Shuttle:** Provides shuttle services to Walmart, Safeway, Smith's, and CVS in Fort Mohave.

[6] City of Needles. Water Department. https://cityofneedles.com/services/water-department/

[7] City of Needles. Wastewater. https://cityofneedles.com/services/waste-water/

Figure 2-1: Land Use and Zoning Map



CHAPTER 3 – HAZARD ASSESSMENT

Hazard Profiles

This chapter discusses the types of hazards that might reasonably occur in Needles. It describes these hazards and how they are measured, where they may occur, a history of these hazards in and around the city, and the future risk they pose. The discussion of future risks includes changes to the frequency, intensity, and/or location of these hazards due to climate change. This chapter also discusses how the HMPC selected and prioritized this Plan's hazards.

Hazard Identification

FEMA guidance identifies several hazards that communities should evaluate for inclusion in a hazard mitigation plan. Communities may also consider additional hazards for their plans. The HMPC reviewed an extensive list of hazards and excluded those that do not pose a significant threat to Needles. **Table 3-1** lists the hazards considered and explains the reasoning for inclusion/exclusion. For context, this table also shows if a hazard is recommended for consideration by FEMA if it is included in the 2023 California State Hazard Mitigation Plan (SHMP) and if it is included in the San Bernardino County Hazard Mitigation Plan (SB HMP). This table does not include all potential impacts; the table is based on FEMA and State guidance and the most probable impacts within Needles. As a result, some hazards like war or foreign invasion are better addressed at the Federal level.

Table 3-1: Hazard Evaluation for Needles LHMP

Hazard	Recommended for Consideration	Included in LHMP?	Reason for Inclusion or Exclusion
Agricultural Pests	SHMP	No	Needles has minimal agricultural uses within the city that contribute to the economy. Concerns regarding agricultural pests are not a significant concern citywide.
Air Pollution	SHMP	No	Air pollution is a state and regional issue addressed through plans and regulations administered by the Mojave Desert Air Quality Management District and/or California Air Resources Board. Since the City has little control over regulating air quality, this hazard was not included.
Aircraft Incident	SHMP	No	The city is located approximately 24 miles from Laughlin/Bullhead International Airport and approximately 35 miles from Lake Havasu City Airport. Given the distance and lack of history associated with this hazard in the city, it was determined that it should not be included in the plan.

TABLE 3-1: HAZARD EVALUATION FOR NEEDLES LHMP			
Hazard	**Recommended for Consideration**	**Included in LHMP?**	**Reason for Inclusion or Exclusion**
Aquatic Invasive Species	SHMP	No	There are no major bodies of water within the city, which would create a concern regarding aquatic invasive species. This was not deemed a concern by the City.
Avalanche	FEMA guidance SHMP	No	There is no potential for avalanches to occur within the city.
Civil Disturbance or Riot	SHMP	No	The city has no major tourist destinations or facilities that allow large crowds of people to gather. This is not a concern for the City.
Climate Change	SHMP SBC HMP	Yes	Climate change is a concern identified by the HMPC and has been included within each hazard profile where relevant.
Coastal Flooding and Storm	FEMA guidance SHMP	No	Based on its distance from the coast, coastal flooding and storms are not a concern for the City.
Cyber Threats	SHMP	Yes	The growing threat of cyber security and data breaches has increasingly become a potential hazard of concern for the City.
Dam Failure	FEMA guidance SHMP SBC HMP	Yes	There are several dams and reservoirs that could affect the city in the event of failure. The HMPC identified dam failure as a potential hazard of concern.
Drought	SHMP SBC HMP	Yes	Droughts are a recurring hazard in Needles and Southern California and can affect city water supplies.
Energy Shortage	SHMP	Yes	Although the Needles Electric Company has a long history of reliability, the HMPC has identified this as a hazard of concern due to energy demands during the extreme heat of the summer months.
Epidemic, Pandemic, Vector-Borne Disease	SHMP	No	Needles is in San Bernardino County, which has experienced several health-related incidents in the past. The city and the rest of the country have recently responded to the COVID-19 pandemic, which has impacted staff and resources. However, the HMPC felt this issue did not need to be addressed within the LHMP.
Erosion	FEMA guidance SHMP	No	The city has not experienced many major cases of erosion; the HMPC decided it was not a concern for the City.
Expansive Soil	FEMA guidance	Yes	The City has identified expansive soils as a hazard of concern.
Extreme Cold	FEMA guidance SHMP	No	Temperatures in Needles rarely fall to a level that would be considered a danger to public safety. This was not identified as a hazard of concern in the city.

TABLE 3-1: HAZARD EVALUATION FOR NEEDLES LHMP			
Hazard	**Recommended for Consideration**	**Included in LHMP?**	**Reason for Inclusion or Exclusion**
Extreme Heat	FEMA guidance SHMP	Yes	Extreme heat conditions regularly occur in the city and are expected to be a future recurring issue. The City identified this as a concern.
Fault Rupture	FEMA guidance SHMP SBC HMP	No	Alquist-Priolo fault zones occur within the county; however, there are no Alquist-Priolo fault zones in the city.
Flooding	FEMA guidance SHMP	Yes	Portions of the city are located within floodplains and have experienced historic flooding. More localized floods also occur during the monsoons. This has been identified as a hazard of concern for the City.
Fracking	SHMP	No	Fracking does not occur in Needles.
Hail	FEMA guidance	No	Hail that is severe enough to pose a threat to people and property is not a concern identified by the HMPC.
Hazardous Materials release	SHMP	Yes	Hazardous material spills occur most frequently along railroad tracks and major highways, both of which run through the center of Needles. This is a hazard of concern for the City.
Hurricane	FEMA guidance SHMP	No	Hurricanes do not occur in Needles.
Infrastructure Failure	SHMP	No	Infrastructure failure can pose a threat to people and property in Needles. Infrastructure failure is discussed as a function of other hazards.
Landslide	FEMA guidance SHMP	No	The HMPC did not identify this as a hazard of concern for the City.
Levee Failure	SHMP	No	The HMPC identified flooding as a hazard of concern, given the lack of levees within the city; however, this was not identified as a hazard of concern.
Lightning	FEMA guidance	No	Although lightning occasionally occurs in Needles, it does not pose a significant threat to people or property.
Liquefaction	FEMA guidance SHMP SBC HMP	No	This is not an issue in Needles and was not identified as a hazard of concern by the HMPC.
Methane-containing Soils	SBC HMP	No	The city does not have methane-containing soils that pose a threat to the public health and safety of residents and businesses. The HMPC did not identify this as a hazard of concern to the City.

TABLE 3-1: HAZARD EVALUATION FOR NEEDLES LHMP			
Hazard	**Recommended for Consideration**	**Included in LHMP?**	**Reason for Inclusion or Exclusion**
Natural Gas Pipeline Hazards	SHMP	Yes	Natural gas transmission pipelines are located within the city and could pose a danger to people and property if they breach and release their contents into the community; therefore, the HMPC has identified this as a hazard of concern.
Oil Spills	SHMP	No	There is no history of oil drilling and extraction within the city. Based on this, the HMPC did not identify this as a hazard of concern to the City.
Power Failure	SHMP	Yes	Although the Needles Electric Company has a long history of reliability, the HMPC has identified this as a hazard of concern due to energy demands during the extreme heat of the summer months.
Radiological Accidents	SHMP	No	There are no known major radiation sources in Needles or the immediate surrounding area that could seriously threaten the community.
Sea-level Rise	FEMA guidance SHMP	No	Needles is not located within close proximity to the ocean.
Seiche	FEMA guidance SHMP	No	The HMPC did not identify this as a hazard of concern for the City.
Seismic Shaking	FEMA guidance SHMP SBC HMP	Yes	Needles is in a seismically active area where shaking can be severe enough to damage property or cause loss of life. For this reason, the HMPC determined it should be addressed in this plan.
Severe Wind	FEMA guidance	Yes	Severe wind events are a common occurrence within the city and Southern California. This hazard is included in the Severe Weather profile and is referred to as severe wind.
Severe Weather and Storms	FEMA guidance SHMP SBC HMP	Yes	Severe Weather includes discussions regarding severe wind, extreme heat, and thunderstorms, which are weather-related hazards that are most common in Needles.
Storm Surge	FEMA guidance	No	The HMPC did not identify this as a hazard of concern since the city is not located near the California coastline.
Subsidence	FEMA guidance	No	The HMPC did not identify subsidence as a hazard of concern for the City.
Mass-Casualty Incident (Terrorism)	SHMP	No	The HMPC did not identify this as a hazard of concern.
Thunderstorm	SHMP	Yes	The monsoons that occur in the city can bring dangerous thunderstorms. This hazard is discussed as part of the Severe Weather and Storms category.

TABLE 3-1: HAZARD EVALUATION FOR NEEDLES LHMP			
Hazard	**Recommended for Consideration**	**Included in LHMP?**	**Reason for Inclusion or Exclusion**
Tornadoes	FEMA guidance SHMP	No	Tornadoes are not a typical occurrence in the county or city; therefore, the City did not identify this as a hazard of concern.
Transportation Accidents	SHMP	Yes	The HMPC identified this as a hazard of concern due to the highway and rail infrastructure in and around the city.
Tree Mortality	SHMP	No	The HMPC did not identify this as a hazard of concern for the City.
Tsunami	FEMA guidance SHMP	No	The HMPC did not identify tsunamis as a hazard of concern since the city is not located near the California coastline.
Urban Fire	SHMP SBC HMP	No	The HMPC did not identify urban fires as a risk to property and life in Needles.
Volcano	SHMP	No	There are no volcanoes near Needles that pose a reasonable threat.
Wildfire	FEMA guidance SHMP	Yes	The HMPC identified wildfire as a major threat to the city.

After hazard evaluation and the organizational changes were made by the HMPC, this Plan discusses eight broad hazard types with their respective sub-categories (**Table 3-2**), including climate change, which is discussed in each hazard profile:

TABLE 3-2: HAZARD CATEGORIES AND SUB-CATEGORIES	
Hazard Category	**Sub-Categories**
Seismic Hazards	Seismic Shaking
Wildland Fires	
Severe Weather	Drought, Extreme Heat, Severe Wind, Thunderstorms
Infrastructure Failure	Energy Shortage, Power failure (PSPS)
Geologic Hazards	Expansive Soils
Flood	Dam Failure
Human-Caused Hazards	Cyber Threats, Hazardous Materials Incident, Natural Gas Pipeline Hazards, Transportation Accident
Climate Change	(*Discussed in all relevant Hazard Categories)*

Hazard Scoring And Prioritization

The HMPC followed FEMA guidance for hazard mitigation plans and prioritized each of the eight hazards and their respective subcategories. In the initial step, it assigned a score of 1 to 4 for each of the hazards for the following criteria:

- **Probability:** The likelihood that the hazard will occur in Needles in the future.
- **Magnitude/Severity:** The severity of the direct damage of the hazard to Needles.

- **Warning Time:** The time the city has before a disaster event/hazard impacts Needles.
- **Duration:** The time that the disaster event will affect Needles.

The HMPC assigned a weighting value to each criterion, giving a higher weight to the criteria deemed more important and multiplied the score for each criterion by weighing the factor in determining the overall score for each criterion.

FEMA recommended these weighting values:

- **Probability:** 2.0
- **Location:** 0.8
- **Maximum Probable Extent (Primary Impact):** 0.7
- **Secondary Impacts:** 0.5

After calculating the total impact score for each hazard (sum of the location, maximum probable extent, and the secondary impact). FEMA guidance recommends multiplying the total impact score by the overall probability to determine the final score for each hazard. A final score between 0 and 12 is considered a low-threat hazard, 12.1 to 42 is a medium-threat hazard, and a score above 42 is considered a high-threat hazard. This final score determines the prioritization of the hazards. **Table 3-3** depicts the criterion for the scoring for each hazard as previously discussed, including probability, location, primary impact, and secondary impacts.

In compliance with the Disaster Mitigation Act (and as further specified by Interim Final Rule 44 CFR Section 206.401(c)(2)(i)), this LHMP addresses, in substantial detail, the primary hazards facing the city. Lower-priority hazards are addressed at a lesser level of detail due to their relatively reduced impacts, as identified in the hazard assessment discussion. **Table 3-4** shows each hazard's criterion scores, final score, and threat level based on the above prioritization process.

TABLE 3-3: CRITERION SCORING				
CPRI Category	Degree of Risk Chart			Assigned Weight Factor
	Level ID	Description	Index	
Probability	Unlikely	• Extremely rare with no documented history of occurrences or events. • Annual probability of less than 0.001	1	45%
	Possible	• Extremely rare with no documented history of occurrences or events. • Annual probability of between 0.01 and 0.001	2	
	Likely	• Occasional occurrence with at least two or more documented historic events. • Annual probability of between 0.1 and 0.01	3	
	Highly Likely	• Frequent events with a well-documented history of occurrence. • Annual probability of greater than 0.1	4	
Magnitude/Severity	Negligible	• Negligible property damages (less than 5% of critical and non-critical facilities and infrastructure) • Injuries or illnesses are treatable with first aid and there are no deaths • Negligible quality of life lost • Shut down of critical facilities for less than 24 hours	1	30%
	Limited	• Slight property damages (greater than 5% and less than 25% of critical and non-critical facilities and infrastructures) • Injuries and illnesses do not result in permanent disability and there are no deaths • Moderate quality of life lost • Shut down of critical facilities for more than 1 day and less than 1 week	2	
	Critical	• Moderate property damages (greater than 25% and less than 50% of critical and non-critical facilities and infrastructures) • Injuries or illnesses result in permanent disability and at least one death • Shut down of critical facilities for more than 1 week and less than 1 month	3	
	Catastrophic	• Severe property damages (greater than 50% of critical and non-critical facilities and infrastructure) • Injuries or illnesses result in permanent disability and multiple deaths • Shut down of critical facilities for more than 1 month	4	
Warning Time	Less than 6 hours	Population will receive less than 6 hours of warning	4	15%
	6 to 12 hours	Population will receive between 6-12 hours of warning	3	
	12 to 24 hours	Population will receive between 12-24 hours of warning	2	
	More than 24 hours	Population will receive greater than 24 hours of warning	1	
Duration	Less than 6 hours	Disaster event will last less than 6 hours	1	10%
	Less than 24 hours	Disaster event will last between 6-24 hours	2	
	Less than one week	Disaster event will last between 24 hours and 1 week	3	
	More than one week	Disaster event will last more than 1 week	4	

Table 3-4: Needles Hazard Prioritization Worksheet

HAZARD RANKING WORKSHEET - City of Needles — DATE: 7/31/2024

Hazard Type	Probability	Impact			Total Score	Hazard Planning Consideration
		Location	Primary Impact	Secondary Impacts		
Drought	4	4	4	4	64.00	High
Extreme Heat	4	4	4	4	64.00	High
Severe Wind	4	4	4	4	64.00	High
Thunderstorm (Monsoons)	4	4	3	3	54.40	High
Wildfire	4	4	3	3	54.40	High
Cyber Threats	4	3	3	3	48.00	High
Flood (Monsoons)	3	3	3	3	36.00	Medium
Dam Failure/ Inundation	2	4	4	4	32.00	Medium
Energy Shortage	2	4	3	3	27.20	Medium
Hazardous Materials	3	2	2	2	24.00	Medium
Seismic Shaking	2	4	2	2	22.40	Medium
Natural Gas Pipeline Hazards	2	2	3	3	20.80	Medium
Transportation Accidents	2	2	3	3	20.80	Medium
Expansive Soils	2	2	2	2	16.00	Medium
Power Outage	1	3	3	3	12.00	Low
					0.00	Low

* Climate Change considerations discussed as appropriate within each hazard.

Probability	Importance
Based on estimated likelihood of occurrence from historical data	2.0
Probability	Score
Unlikely	1
Occasional	2
Likely	3
Highly Likely	4

Secondary Impacts	Importance
Based on estimated secondary impacts to community at large	0.5
Impact	Score
Negligible - no loss of function, downtime, and/or evacuations	1
Limited - minimal loss of function, downtime, and/or evacuations	2
Moderate - some loss of function, downtime, and/or evacuations	3
High - major loss of function, downtime, and/or evacuations	4

Location	Importance
Based on size of geographical area of community affected by hazard	0.8
Affected Area	Score
Negligible	1
Limited	2
Significant	3
Extensive	4

Maximum Probable Extent (Primary Impact)	Importance
Based on percentage of damage to typical facility in community	0.7
Impact	Score
Weak - little to no damage	1
Moderate - some damage, loss of service for days	2
Severe - devastating damage, loss of service for months	3
Extreme- catastrophic damage, uninhabitable conditions	4

Total Score = Probability x Impact, where:
Probability = (Probability Score x Importance)
Impact = (Affected Area + Primary Impact + Secondary Impacts), where:
Affected Area = Affected Area Score x Importance
Primary Impact = Primary Impact Score x Importance
Secondary Impacts = Secondary Impacts Score x Importance

Hazard Planning Consideration			
Total Score	Range	Distribution	Hazard Level
0.0	12.0	0	Low
12.1	42.0	0	Medium
42.1	64.0	0	High

The probability of each hazard is determined by assigning a level, from unlikely to highly likely, based on the likelihood of occurrence from historical data. The total impact value includes the affected area, primary impact and secondary impact levels of each hazard. Each level's score is reflected in the matrix. The total score for each hazard is the probability score multiplied by it's importance factor times the sum of the impact level scores multiplied by their importance factors. Based on this total score, the hazards are separated into three categories based on the hazard level they pose to the communities: High, Medium, Low.

Earthquake Hazards (Seismic Shaking)

Description

An earthquake is a sudden motion or trembling caused by a release of strain accumulated within or along the edge of the Earth's tectonic plates. The effects of an earthquake can be felt far beyond the site of its occurrence. They usually occur without warning and can cause massive damage and extensive casualties after just a few seconds. Common effects of earthquakes are ground motion and shaking, surface fault ruptures, and ground failure. Ground motion is the vibration or shaking of the ground during an earthquake. When a fault ruptures, seismic waves radiate, causing the ground to vibrate. The severity of the vibration increases with the amount of energy released and decreases with distance from the causative fault or epicenter.

Seismic Shaking

Seismic shaking is the motion felt on the earth's surface caused by an earthquake. In most cases, earthquakes are not powerful enough to feel the shaking. However, particularly powerful earthquakes can generate significant shaking, causing widespread destruction and property damage.

Location and Extent

Southern California, including Needles, is a highly seismic area due to the major faults that run through the region and are subject to seismic shaking. The intensity of seismic shaking is usually measured with the Modified Mercalli Intensity (MMI) scale, which is based on the amount of observed damage. The MMI scale has replaced the Richter scale, which is no longer used since it loses effectiveness when measuring larger earthquakes. Since the degree of shaking, and consequently damage, generally decreases as the seismic energy travels further away from the fault rupture's point of origin, different sections of a city or region can report different MMI measurements in different locations. The MMI scale uses Roman numerals on a 12-point scale to measure each degree of shaking intensity. **Table 3-4** shows the MMI scale, while **Table 3-5** lists the earthquake faults that can impact the city.

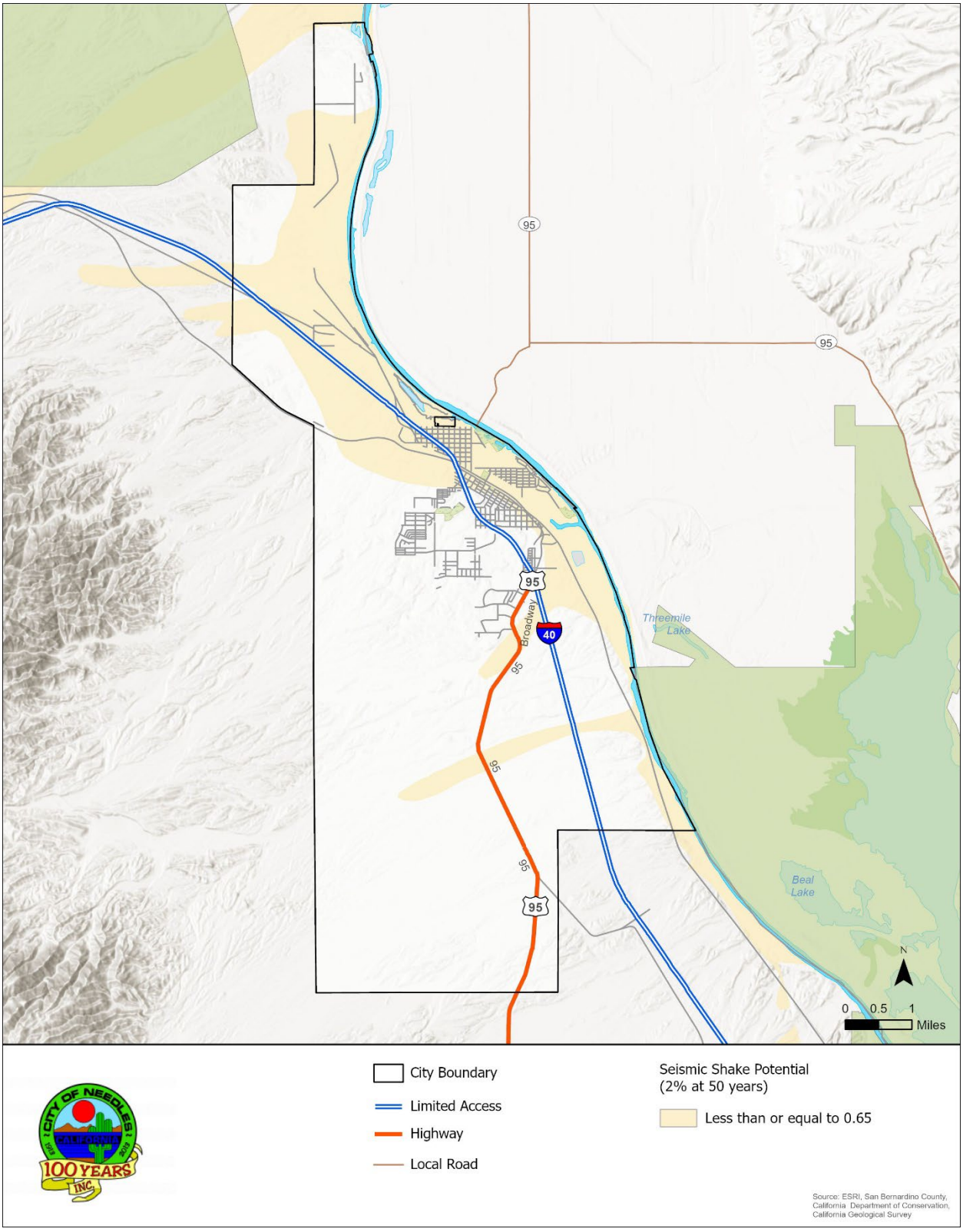
Another scale for measuring seismic shaking is the moment magnitude scale (MMS, denoted Mw or simply M). The MMS measures the energy the fault rupture releases, which begins at 1.0 and increases as the earthquake's energy grows. The MMS is a logarithmic scale, meaning that the difference between numbers on the scale multiplies as they increase. An earthquake with 5.0 M is approximately 1.4 times greater than 4.9 M, 32 times greater than 4.0 M, and 1,000 times greater than 3.0 M.

Seismic shaking can also be measured in relationship to the force of Earth's gravity (g) or percent g. This method is useful for geographically displaying areas of seismic shaking potential. Percent g is computed by determining the acceleration of the earthquake's motion relative to the force of gravity. The acceleration of gravity is 980 centimeters per second, so if, for example, an earthquake's acceleration is measured at 765 centimeters per second, the shaking is modeled as 765/980, or .781 g (78.1% g). **Figure 3-1** shows the seismic shaking potential in the city.

TABLE 3-4: MODIFIED MERCALLI INTENSITY SCALE		
Intensity	**Description**	**Description**
I	Instrumental	Felt only by very few people under especially favorable conditions.
II	Feeble	Felt only by a few people at rest, especially on the upper floors of buildings.
III	Slight	Noticeable by people indoors, especially on upper floors, but not always recognized as an earthquake.
IV	Moderate	Felt by many indoors and by some outdoors. Sleeping people may be awakened. Dishes, windows, and doors are disturbed.
V	Slightly strong	Felt by nearly everyone, and many sleeping people are awakened. Some dishes and windows broken, and unstable objects overturned.
VI	Strong	Felt by everyone. Some heavy furniture is moved, and there is slight damage.
VII	Very strong	Negligible damage in well-built buildings, slight to moderate damage in ordinary buildings, and considerable damage in poorly built buildings.
VIII	Destructive	Slight damage in well-built buildings, considerable damage and partial collapse in ordinary buildings, and great damage in poorly built buildings.
IX	Ruinous	Considerable damage in specially designed structures. Great damage and partial collapse in substantial buildings, and buildings are shifted off foundations.
X	Disastrous	Most foundations and buildings with masonry or frames are destroyed, along with some well-built wood structures. Rail lines are bent.
XI	Very disastrous	Most or all masonry structures are destroyed, along with bridges. Rail lines are greatly bent.
XII	Catastrophic	Damage is total. The lines of sight are distorted, and objects are thrown into the air.
Source: United States Geological Survey. 2019. The Modified Mercalli Intensity Scale. https://www.usgs.gov/media/images/modified-mercalli-intensity-mmi-scale-assigns-intensities		

TABLE 3-5: EARTHQUAKE FAULTS THAT IMPACT THE CITY OF NEEDLES				
Fault Name	**Magnitude**	**Modified Mercalli Ranking**	**Perceived Shaking**	**Potential Damage**
Manix-Afton Hills	7.1	IV	Light	None
Black Hills Fault (Nevada)	6.2	IV	Light	None
Bullion Mountains	6.9	IV	Light	None
Garlock	7.7	V	Moderate	Very Light
Hector Mine	6.8	I	Not Felt	None
Ludlow	7.1	V	Moderate	Very Light
Pinto Mountain	7.3	V	Moderate	Very Light
San Andreas	7.1	V	Moderate	Very Light
Source: USGS Earthquake Scenario Map				

Figure 3-1: Seismic Shaking Potential in Needles



PAST EVENTS

Since seismologists started recording and measuring earthquakes, there have been tens of thousands of recorded earthquakes in Southern California, most with a magnitude below three. No community in Southern California is beyond the reach of a damaging earthquake. **Table 3-6** shows all earthquakes in Southern California with a magnitude of 5.0 or higher

TABLE 3-6: EARTHQUAKE EVENTS IN THE SOUTHERN CALIFORNIA REGION (5.0+ MW)		
1812 Wrightwood	1941 Santa Barbara	1992 Joshua Tree
1812 Santa Barbara Channel	1942 Fish Creek Mountains	1992 Big Bear
1857 Fort Tejon	1947 Manix	1994 Northridge
1892 Laguna Salada	1948 Desert Hot Springs	2001 West Hollywood
1899 Cajon Pass	1952 Kern County	2008 Chino Hills
1899 San Jacinto Fault Zone	1954 San Jacinto Fault (Arroyo Salada)	2010 Baja CA
1910 Elsinore	1968 Borrego Mountain	2012 Brawley
1915 Imperial Valley	1971 San Fernando	2014 La Habra
1918 San Jacinto	1978 Santa Barbra	2016 Borrego Springs
1923 North San Jacinto Fault	1979 Imperial Valley	2019 Ridgecrest
1925 Santa Barbra	1986 North Palm Springs	2021 Antelope Valley
1927 Lompoc	1986 Oceanside	2024 Lamont
1933 Long Beach	1987 Whittier Narrows	
1940 Imperial Valley	1991 Sierra Madre	
Source: USGS Earthquake Catalog		

Needles has experienced two earthquakes in the last 30 years of a magnitude greater than 4.0.

- **January 17, 1994** – The Northridge Earthquake (DR-1008) caused at least 57 fatalities (subsequent findings put the death toll at 72) and injured thousands. The earthquake caused up to $20 billion in damage costs and $40+ billion in economic loss. Although light shaking was felt in Needles, no damage was reported.[8]
- **October 16, 1999** – The Hector Mine Earthquake struck a remote part of the desert between Barstow, CA and Needles. The earthquake measured as a 7.1 magnitude and originated at the 29 Palms Marine Corps Base. Although slight shaking was felt in Needles, no damage was reported.[9]

[8] California Department of Conservation. Northridge Earthquake, January 17, 1994. https://www.conservation.ca.gov/cgs/earthquakes/northridge

[9] United States Geological Survey. M 7.1 - The 1999 Hector Mine, California Earthquake. https://earthquake.usgs.gov/earthquakes/eventpage/ci9108652/executive

- **July 29, 2024** – A 4.9 magnitude earthquake struck the Mojave Desert. Shaking was felt throughout the Colorado River valley and all the way to Los Angeles. The earthquake was centered approximately 13 miles northeast of Barstow, CA.[10]

Other strong regional earthquakes have occurred in Southern California, but their epicenters have been so distant from Needles that seismic shaking generated by the event did not cause significant property damage or harm to the city. The most recent significant earthquake affecting the Southern California region was the Northridge Earthquake in 1994. At 4:31 A.M. on Monday, January 17, a 6.7 earthquake struck the San Fernando Valley. Thousands of aftershocks occurred in the following days and weeks, causing additional damage to affected structures. Fifty-seven people were killed, and more than 1,500 people were seriously injured. For days afterward, thousands of homes and businesses were without electricity; tens of thousands had no gas, and nearly 50,000 people had little or no water. Approximately 15,000 structures were moderately to severely damaged, leaving thousands of people temporarily homeless; 66,500 buildings were inspected, nearly 4,000 were severely damaged, and over 11,000 were moderately damaged. Several collapsed bridges and overpasses created commuter havoc on the freeway system. Extensive damage was caused by ground shaking, but the earthquake triggered liquefaction, and dozens of fires also caused additional severe damage. This extremely strong ground motion in large portions of San Bernardino County resulted in record economic losses.

Risk Of Future Events

Historical and geological records show California has a long history of seismic events. Southern California is probably best known for the San Andreas Fault, a 400-mile-long fault running from the Mexican border to a point offshore, west of San Francisco. Geologic studies show that over the past 1,400 to 1,500 years, large earthquakes have occurred at about 130-year intervals on the Southern San Andreas Fault. As the last large earthquake on the Southern San Andreas occurred in 1857, that section of the fault is considered a likely location for an earthquake within the next few decades. The Third Uniform California Earthquake Rupture Forecast (UCERF3) was released in 2015 and is the most recent assessment of the probability of a major earthquake on various faults between 2015 and 2044. **Table 3-7** shows the results for Needles' nearby and regional fault lines.

The U.S. Geological Survey scenarios show that the Garlock, Ludlow, Pinto Mountain, and San Andreas faults could cause the strongest seismic shaking in Needles. The more distant faults, like the San Andreas fault, can produce more intense earthquakes but are less likely to cause damage in Needles due to their greater distance from the city. However, as **Table 3-7** notes, the likelihood of a powerful earthquake occurring along most of these faults within the next 25 years is generally very low or negligible. Recent studies for State Route 95 realignment in Mohave Valley, AZ indicate that movement along faults in the Needles graben zone are not expected to generate earthquales larger than a magnitude 6.0.

[10] Needles Desert Star & Los Angeles Times, "4.9 Magnitude Earthquake Shakes Mojave Desert Monday," needlesdesertstar.com, July 29, 2024, https://www.needlesdesertstar.com/news/4-9-magnitude-earthquake-shakes-mojave-desert-monday/article_9e18d3de-4de9-11ef-a620-c343b46b269d.html.

As depicted in **Table 3-2** and **Table 3-3**, seismic shaking will remain a possible occurrence with an annual probability of between a one-tenth of a percent and a one percent chance each year.

TABLE 3-7: EARTHQUAKE PROBABILITIES FOR KEY FAULTS NEAR NEEDLES (2015-2044)

Fault	Distance (Miles)*	Estimated Probabilities			
		6.7+ Mw	7.0+ Mw	7.5+ Mw	8.0+ Mw
Baker	74.96	0.23%	0.12%	0.08%	Negligible
Bullion Mountains	92.78	1.06%	0.17%	Negligible	Negligible
Calico-Hidalgo	115.81	2.40%	2.18%	0.76%	Negligible
Garlock	144.02	4.79%	4.63%	2.82%	0.30%
Hector Mine	101.37	0.57%	0.22%	Negligible	Negligible
Manix-Afton Hills	88.06	0.83%	0.31%	Negligible	Negligible
Ludlow	89.90	0.47%	0.18%	Negligible	Negligible
Pinto Mountain	102.06	2.91%	2.83%	1.29%	Negligible
San Andreas	119.89	23.99%	20.78%	10.76%	2.80%

* Distance between Needles City Hall and the nearest point of the fault. All distances are approximate.

† Southern California segments only.

Note: UCERF3 results consist of two individual models (3.1 and 3.2), each of which provides rupture probabilities for each segment of the fault. This table shows the maximum probability for a section of the fault in either model.

Source: Working Group on California Earthquake Probabilities. 2015. The Third California Earthquake Rupture Forecast (UCERF3). http://www.wgcep.org/ucerf3

CLIMATE CHANGE CONSIDERATIONS

There is no direct link between climate change and seismic activity, so climate change is not expected to cause any changes to the frequency or intensity of seismic shaking. Some research indicates that climate change could result in “isostatic rebounds,” or a sudden upward movement of the crust because of reduced downward weight caused by glaciers. As glaciers are known to melt when global temperatures increase, climate change could indirectly lead to increased seismicity in Southern California.[11]

Wildfire

DESCRIPTION

Wildfires are fires that burn in largely undeveloped and natural areas and are a regular feature of ecosystems throughout California. These fires help to clear brush and debris from natural areas and are necessary for the health of many ecosystems and various species' life cycles. However, since the early twentieth century, the common practice was to suppress naturally occurring fires in wildland areas, allowing dry plant matter and other fuels to build up.

At the same time, human activity has caused changes in the buffer zone between urbanized and undeveloped areas, known as the wildland-urban interface (WUI). The more natural setting

[11] Masih, A. January 2018. “An Enhanced Seismic Activity Observed Due to Climate Change: Preliminary Results from Alaska.” IOP Conference Series: Earth and Environmental Science. doi :10.1088/1755-1315/167/1/012018. https://iopscience.iop.org/article/10.1088/1755-1315/167/1/012018/pdf

of a WUI can make these zones highly desirable places to live. In many parts of California, the WUIs have become developed, albeit at lower densities than fully urbanized areas. However, this development activity has brought more people into wildfire-prone areas. The availability of fuel, increasing encroachment into the WUI, and a changing climate have made wildfires among California's most common and dangerous natural hazards. Additionally, invasive pests such as the polyphagous shothole borer can kill trees, creating more dead material that will potentially provide additional fuel for wildfires.

Lightning, accidents, or arson can spark wildfires. The size and severity of any fire depend on fuel, weather conditions, and topography availability. However, wildfires in the WUI do not need to be large to be damaging. In Oakland, the 1991 Tunnel Fire was relatively small, only 1,600 acres, but it was one of California's deadliest and most destructive wildfires.[12] The flames from wildfires create severe risks to property and lives. Smoke and other particulate matter from wildfires pose a health risk, even to those not near the blaze. Burned areas can be more susceptible to flooding and landslides because wildfires destroy the vegetation that helps slow down water runoff and hold slopes together.[13] The ground may repel water rather than absorb it when faced with ash deposits. Due to the change in the landscape structure after a fire, repelled water can carry debris into water reservoirs.[14]

Location and Extent

Wildfires are not measured on a specific scale and are usually classified by size (e.g., acres burned) or impact (buildings destroyed or damaged, injuries or deaths, cost of damage, etc.). The California Department of Forestry and Fire Protection (Cal Fire) defines the wildfire hazard zones on a three-tier scale of fire hazard severity zones (FHSZs): very high, high, and moderate. These zone classifications do not correspond to a specific risk or intensity of fire but are qualitative terms that consider many factors. Fire-prone areas are also classified by the agency responsible for fire protection. Federal Responsibility Area (FRA) falls to federal agencies such as the US Forest Service, the Bureau of Land Management, and the National Park Service. State Responsibilities Area (SRA), which includes unincorporated land within counties with statewide watershed value, falls to the Cal Fire. Local Responsibility Area (LRA), which includes portions of incorporated cities with identified wildfire hazard zones, falls to local governments.

Needles is in an area susceptible to wildfires, and portions of the community are within the wildland-urban interface (WUI). The WUI is the zone of transition between the wilderness and human-developed lands. Wildfires present a significant threat to the city and the county in or near the WUI, as it has relatively high temperatures, low humidity, and low precipitation during the summer. Fire threat assessment and Geographic Information System (GIS) mapping for Needles identifies the WUI as the area with the highest fire risk within the city. According to Cal Fire FHSZ mapping, the city is not located near any Very High Fire Hazard Severity Zones (VHFHSZ). **Figure 3-2** identifies portions of the city located within the WUI and historic fire perimeters in the city.

[12] Cal OES. 2016. https://webservices.caloes.ca.gov/wp-content/uploads/sites/10/2016/10/Top20_Deadliest.pdf

[13] EPA. 2019. “Wildfires: How Do They Affect Our Water Supplies?” https://www.epa.gov/sciencematters/wildfires-how-do-they-affect-our-water-supplies

[14] Bichell, R. 2019. “How Wildfires May Muck Up the West’s Reservoirs.” Colorado Public Radio. https://www.cpr.org/2019/09/25/how-wildfires-may-muck-up-the-wests-reservoirs/

A fire can only ignite if three elements are present: heat, fuel, and oxygen. If any of these elements is removed, the fire will extinguish itself. In Needles, copious amounts of fuel are available from the structures throughout the city and the brush in and around the city, which makes them extremely flammable. Activity that creates intense heat that is unmonitored or unregulated may lead to the ignition of a fire. The National Institute of Standards and Technology, Fire Research Division, has developed a scale that measures the increase in temperature and the kind of fire response that develops. **Table 3-8** shows the progression of temperature relative to fire response.

Once a fire has been ignited, it could conceivably grow indefinitely if abundant fuel and oxygen are available. For example, a fire that ignites in one house could hypothetically continue to expand and even spread to other adjacent houses if there was enough fuel to link the structures together. Fires in confined spaces may occasionally burn so intensely that they consume all the oxygen available and burn out before they can expand.

TABLE 3-8: FIRE SUSCEPTIBILITY BASED ON TEMPERATURE INCREASE

Temperature (°F)	Response
98.6 °F	Average normal human oral/body temperature.
101 °F	Typical body core temperature for a working firefighter.
109 °F	Human body core temperature that may cause death.
111 °F	Human skin temperature when pain is felt.
118 °F	Human skin temperature causing a first-degree burn injury.
130 °F	Hot water causes a scald burn injury with 30 s exposure.
131 °F	Human skin temperature with blistering and second-degree burn injury.
140 °F	Temperature when burned human tissue becomes numb.
162 °F	Human skin temperature at which tissue is instantly destroyed.
212 °F	Temperature when water boils and produces steam.
482 °F	Temperature when charring of natural cotton begins.
>572 °F	Modern synthetic protective clothing fabrics begin to char.
≥752 °F	Temperature of gases at the beginning of room flashover.
≈1832 °F	Temperature inside a room undergoing flashover.

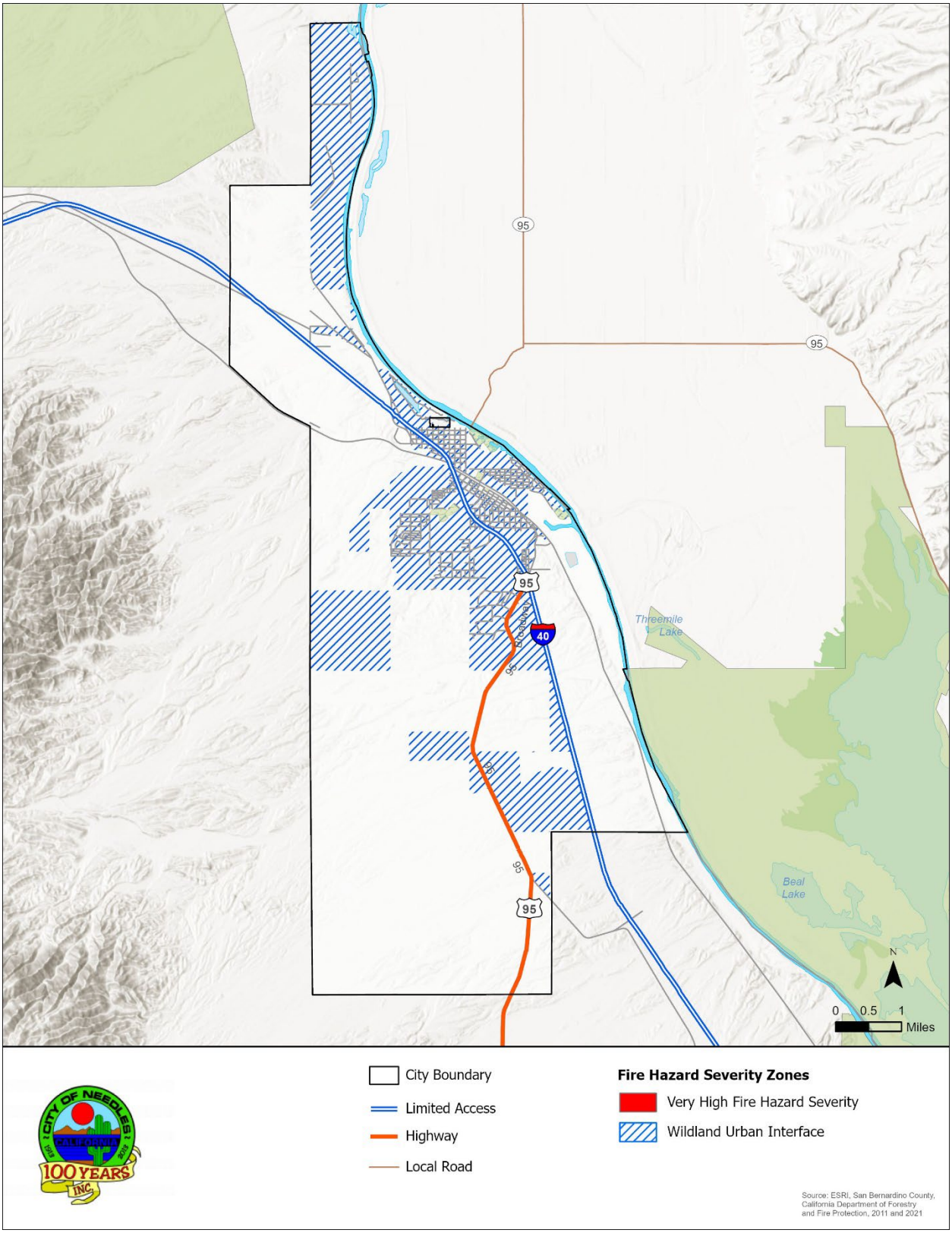
PAST EVENTS

- **June 22, 2024** – A brush fire ignited in Needles and eventually jumped the Colorado River into Mohave Valley, AZ. Approximately 70 acres were burned, which included one abandoned structure. No injuries were reported. The cause of the fire is unknown.

RISK OF FUTURE EVENTS

The history of wildfires in San Bernardino County and Needles and continued development within the city's WUI indicates that wildfire events are likely to occur in the future. The risk is expected to remain highest in the undeveloped land in and around the city and the county's unincorporated areas. According to **Table 3-2** and **Table 3-3**, the probability of a wildfire occurring will be frequent, with an annual probability of greater than 10 percent.

Figure 3-2: Wildland Urban Interface (WUI) and Historical Wildfire Perimeters



Climate Change Considerations

Climate change is expected to cause an increase in temperatures and more frequent and intense drought conditions. This increase will likely increase the amount of dry plant matter available for fuel, increasing wildfire risk statewide. However, increases in fuel supplies could cause wildfires to move faster or spread into more developed areas, increasing the future threat to Needles and other surrounding communities.

Severe Weather (Drought, Extreme Heat, Severe Wind, Thunderstorms)

Description

Drought

A drought is a long period with substantially less precipitation than usual. The primary direct impact of a drought is the reduction of available water supplies. This is particularly concerning in agricultural areas and natural environments but can also affect urban areas. Droughts can harm landscapes because plants do not get the water they need to survive. In severe cases, droughts may lead to a human health risk if available water supplies are insufficient to meet basic needs.

Indirectly, drought causes soils to dry out, making them harder and less able to absorb water. When precipitation returns, the soil absorbs less water, increasing runoff, which can lead to flooding. Dry soils are more susceptible to erosion, especially if plants have died or no longer provide stability due to loss of roots and soil composition changes. Drought causes many plants in natural areas to dry out, making them more susceptible to pests/diseases and increasing the risk of wildfires.

Extreme Heat

Extreme heat is a period when temperatures are abnormally high relative to the normal temperature range. There are generally three types of extreme heat events:

- **Extreme Heat Days:** A day during which the maximum temperature surpasses 98 percent of all historic high temperatures for the area, using the time between April and October from 1950 to 2005 as the baseline.
- **Warm Nights:** A day between April and October when the minimum temperature exceeds 98 percent of all historic minimum daytime temperatures observed between 1950 and 2005.
- **Extreme Heat Waves:** A successive series of extreme heat days and warm nights where extreme temperatures do not abate; while no universally accepted minimum length of time for a heatwave event exists, Cal-Adapt considers four successive extreme heat days and warm nights to be the minimum threshold for an extreme heatwave.

Severe Wind

Severe wind events pose a risk to life and property in the region by creating conditions that disrupt essential systems such as public utilities, telecommunications, and transportation routes. High winds can and do occasionally cause tornado-like damage to local homes and businesses. Severe wind events can present a very destabilizing effect on the dry brush that covers local hillsides and urban-wildland interface areas. High winds can have destructive impacts, especially on trees, power lines, and other utility services.

Wind is simply the movement of air caused by differences in atmospheric temperature. High-pressure air will naturally move to areas of low pressure. Usually, the distance between these high- and low-pressure zones is far; however, these low- and high-pressure zones may occasionally be near one another. When this happens, air will flow dramatically, creating high-speed winds. The National Weather Service identifies two types of straight-line winds that can cause damage: derechos and downbursts. A storm is classified as a derecho if the wind damage swath extends for more than 240 miles and has wind gusts of 58 mph or greater. Downbursts are a common cause of wind damage in thunderstorms. They can reach over 100 mph and are caused by air being dragged down by the thunderstorm's precipitation.[15]

When winds are fast enough, they can cause property damage to homes, public facilities, utilities, and other infrastructure. They can also uproot or topple mature trees or pick up debris and send it careening through the air. This debris can injure or even kill bystanders who may find themselves stranded outside. High-speed winds can deposit this debris in the middle of rights-of-way, such as roads, freeways, and railways, blocking exit routes for would-be evacuees or impeding access to first responders trying to reach wounded people.

Thunderstorms

A thunderstorm is a local rainstorm produced by a cumulonimbus cloud that is accompanied by lightning and thunder. A thunderstorm requires three things to form: moisture, atmospheric instability, and a force capable of lifting air (e.g., warm front, cold front, mountain).[16]

Although thunderstorms generally affect a small area, they can become dangerous due to their ability to generate tornadoes, hailstorms, strong winds, flash flooding, landslides, and lightning. Roads may become impassable from flooding, downed trees or power lines, or a

Cumulonimbus Cloud

Source: Britannica

[15] National Weather Service. https://www.weather.gov/safety/wind-thunderstorms-derecho#:~:text=A%20Derecho%20is%20a%20very,length%20of%20the%20storm's%20path.

[16] NOAA. https://www.noaa.gov/jetstream/thunderstorms

landslide. Downed power lines can lead to loss of utility services like water, phone, and electricity. Typical thunderstorms are 15 miles in diameter and last an average of 30 minutes.

Lighting is a flash of electrical energy produced by a thunderstorm. The resulting clap of thunder is the result of a shock wave created by the rapid heating and cooling of the air in the lightning channel. Lightning kills approximately 50 people in the United States each year and injures hundreds. Lightning can be cloud to air, cloud to cloud, or cloud to ground. Cloud-to-ground strikes can also be the cause of wildfires.

Location And Extent

Drought

Droughts are somewhat frequent in California and typically occur when precipitation is limited for an extended period. Rain arrives in California via atmospheric rivers (channels of moist air located high in the atmosphere) and the El Niño Southern Oscillation (ENSO) cycle (a regional meteorological phenomenon in the southern Pacific Ocean). This cycle typically gives rise to two distinct phases: El Niño, the warm and wet phase, and La Niña, the dry and cold phase. When California experiences a drought, it is typically the result of fewer atmospheric rivers or an active La Niña phase, resulting in lower-than-average precipitation levels. Drought may also occur when conditions in areas where water sources are located experience drought conditions, even though the local region does not. **Table 3-9** identifies the drought classifications used by the US Drought Monitor program. This classification system synthesizes multiple different scales into a descriptive index.

Table 3-9: US Drought Monitor Classification Scheme

Category	Description	Possible Impacts
D0*	Abnormally Dry	Slower growth of crops and pastures
D1	Moderate Drought	Some damage to crops and pastures. Water bodies and wells are low. Some water shortages may occur or may be imminent. Voluntary water use restrictions can be requested.
D2	Severe Drought	Likely crop and pasture losses. Water shortages are common, and water restrictions can be imposed.
D3	Extreme Drought	Major crop and pasture losses. Widespread water shortages and restrictions.
D4	Exceptional Drought	Exceptional and widespread crop and pasture losses. Emergency water shortages develop.

Source: US Drought Monitor
* D0 areas are those under “drought watch,” but not technically in a drought. They are potentially heading into drought conditions or recovering from drought but are not yet back to normal.

Communities that rely on water supplies from other parts of the State versus communities that source their water supplies locally may experience drought differently. Currently, the Needles Water Department relies solely on water extracted from wells in the city.[17]

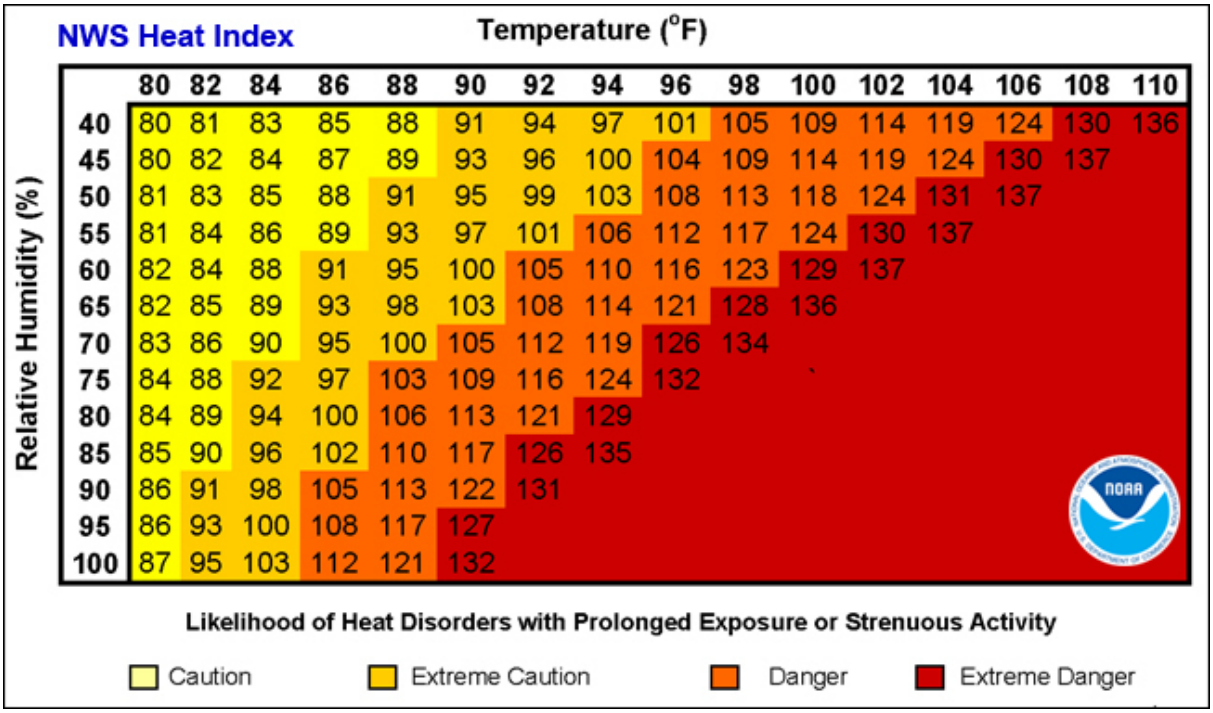
[17] City of Needles Water Department

Droughts are regional events, so all parts of Needles face the same drought risk. However, urban areas will likely experience different effects than open-space areas. It is also possible for communities to experience a "long-distance drought" since many urban areas in California receive water supplies from great distances. If these distant areas experience drought, it may cause water shortages in the urban areas that rely on them, even if these areas are experiencing normal precipitation levels.

Extreme Heat

Extreme heat events will differ from region to region since different areas have historically high temperatures. For example, an extreme heat day on the coast will feel different than an extreme heat day in the High Desert. The reason for this is how humidity affects the perceived heat that people feel. Humid conditions will make a day feel hotter than non-humid conditions, even though the temperature may be the same. The difference between the perceived and actual temperatures is known as the "heat index." To illustrate the effect of the heat index, a 90-degree day with 50 percent humidity feels like 95°F, whereas a 90°F Day with 90 percent humidity feels like 122°F. **Figure 3-3** illustrates the National Oceanic and Atmospheric Administration's (NOAA) National Weather Service Heat Index.

Figure 3-3: NOAA's National Weather Service Heat Index



Extreme heat events are not limited to any part of the city. They occur with the same intensity and duration at the same time across all locations in Needles. For Needles, an extreme heat day involves a temperature that exceeds 115°F, and a warm night involves a temperature that exceeds 89°F.[18] These thresholds are based on a 2% probability event.

[18] https://cal-adapt.org/tools/local-climate-change-snapshot

Severe Wind

The entirety of the city can be affected by severe wind events. Usually, they cause minimal damage; however, severe wind can cause massive damage to the city and personal property. Needles is often affected by winds that accompany monsoons. Severe winds can exacerbate wildfire conditions.

Generally, winds are measured using the Beaufort scale, developed in 1805, categorizing wind events on a force scale from 0 to 12 using their speed and impacts. Any wind classified as force nine or above is generally considered a severe wind event. **Table 3-10** details how the Beaufort scale classifies wind events. Most wind events in Needles are categorized as a storm or lower in the Beaufort Scale.

TABLE 3-10: BEAUFORT SCALE

Force	Speed (mph)	Description
1	0 to 1	**Calm:** Smoke rises vertically, and the sea is flat
2	1 to 3	**Light air:** The direction of wind is shown by smoke drift, but not wind vanes
3	4 to 7	**Light breeze:** Wind is felt on the face, leaves rustle, and wind vanes are moved. Small wavelets appear on the ocean, but do not break
4	8 to 12	**Gentle breeze:** Leaves and small twigs are in motion, and light flags are extended. Large wavelets appear on the ocean, and crests begin to break
5	13 to 18	**Moderate breeze:** Dust and loose paper become airborne, and small branches are moved. Small waves appear on the ocean
6	19 to 24	**Fresh breeze:** Small trees begin to sway and moderate waves form
7	25 to 31	**Strong breeze:** Large branches are in motion, and using an umbrella becomes difficult. Large waves begin to form
8	32 to 38	**Near gale:** Whole trees are in motion and walking against the wind can be hard. Foam from breaking waves is blown in streaks
9	39 to 46	**Gale:** Walking is difficult, and twigs break off trees
10	47 to 54	**Severe gale:** Slight structural damage. Crests of waves begin to topple
11	55 to 63	**Storm:** Trees are uprooted and considerable damage to structures. Very high waves form in long, overhanging crests
12	63 to 72	**Violent storm:** Widespread damage. Exceptionally high waves form, and the ocean is completely covered in foam

*Source: https://www.weather.gov/mfl/beaufort

Thunderstorms

Thunderstorms affecting Needles primarily occur during the monsoon season, typically from June 15th to September 30th. It should be noted that monsoon is a season and not a type of storm. The location and size of a thunderstorm vary depending on regional geography and regional and global weather events. For example, small precipitation events may occur in only one section of Needles. In contrast, a large event could inundate most of San Bernardino County and other parts of Southern California. Understanding this, any part of the city could become inundated by rain, and no part of the city is more susceptible to rainfall than another.

California's precipitation varies yearly, depending on how much moisture the state receives from atmospheric rivers. Atmospheric rivers are corridors along which wet air travels from the tropics to continents. When the moisture arrives in California, it may precipitate as rain or snow. One of California's most known atmospheric rivers is the "Pineapple Express," which brings moist air from the ocean surrounding Hawaii to California. An immense amount of moisture may be transported along the atmospheric rivers that cross over California during certain years, leading to severe rains.[19]

Another weather phenomenon influencing rainfall in Southern California is "El Niño," officially referred to as the "Southern Oscillation" or "El Niño-Southern Oscillation (ENSO)." ENSO can cause increased rainfall, particularly during the winter months, caused by the warming of the surface of the eastern tropical Pacific Ocean, leading to the evaporation of warm, moist air into the atmosphere. Winds bring this moisture to the eastern Pacific and the American continents, where it falls as rain. ENSO does not always lead to increased rainfall by default, but in general, it can increase the chances of winter with higher-than-usual precipitation.[20] [21]

Rain events are usually measured by the amount of precipitation that falls.[22] **Table 3-11** categorizes rain events by the amount of precipitation per hour.

TABLE 3-11: RAIN EVENTS CATEGORIZED BY PRECIPITATION PER HOUR

Rain Type	Description
Heavy Rain	More than 4 mm per hour but less than 8 mm per hour
Very Heavy Rain	Greater than 8 mm per hour
Moderate Shower	Greater than 2 mm, but less than 10 mm per hour
Heavy Shower	Greater than 10 mm per hour, but less than 50 mm per hour
Violent Shower	Greater than 50 mm per hour

Source: https://water.usgs.gov/edu/activity-howmuchrain-metric.html
mm = millimeter

PAST EVENTS

Drought

Like the rest of California, Needles has experienced many drought events throughout its history. Each event has been distinct, with varying lengths, severity, and frequency. One of the earliest recorded major droughts in state history is known as the "Great Drought," which occurred in

[19] NOAA. 2023. "Atmospheric Rivers: What are they and how does NOAA study them?" https://research.noaa.gov/2023/01/11/atmospheric-rivers-what-are-they-and-how-does-noaa-study them/#:~:text=Atmospheric%20rivers%20are%20long%2C%20concentrated,landfall%2C%20especially%20over%20mountainous%20terrain.

[20] NOAA. 2014. "What Is the El Niño–Southern Oscillation (ENSO) in a Nutshell? https://www.climate.gov/news-features/blogs/enso/what-el-ni%C3%B1o%E2%80%93southern-oscillation-enso-nutshell

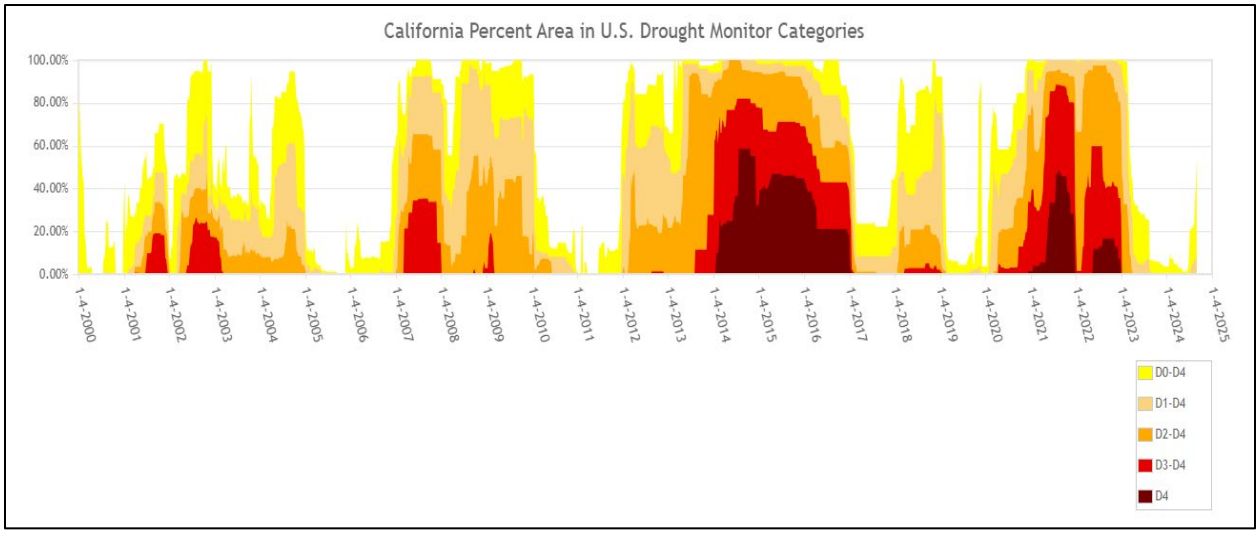
[21] NOAA. 2016. "El Niño and La Niña: Frequently Asked Questions." https://www.climate.gov/news-features/understanding-climate/el-ni%C3%B1o-and-la-ni%C3%B1a-frequently-asked-questions/

[22] NOAA. 2024. "El Niño & La Niña (El Niño – Southern Oscillation). https://www.climate.gov/enso

1863 and 1864. This drought killed 46 percent of the cattle in the state and ultimately led to the decline of cattle ranching. The Dust Bowl Droughts," lasting from 1928 to 1935, had great impacts on the state's agriculture. The effects of this drought were so severe that it sparked the movement to create some of California's modern water irrigation infrastructure, such as the California Aqueduct. Another drought occurred in 1976 and 1977, leading to nearly $1 billion in agricultural losses. Implementation of water-saving practices resulted from this drought, which is still in effect today across the state. Further water conservation practices were enacted during a drought lasting from 1987 to 1993, which caused an estimated $250 million in agricultural damages each year.

California experienced its most recent drought, beginning in 2012 and lasting until 2017. All areas of the state were impacted, and by 2014, it was reported as the most severe drought in 1,200 years. **Figure 3-4** illustrates the severity of the drought conditions experienced over the past 23 years.

Figure 3-4: Drought History (2000-2024)



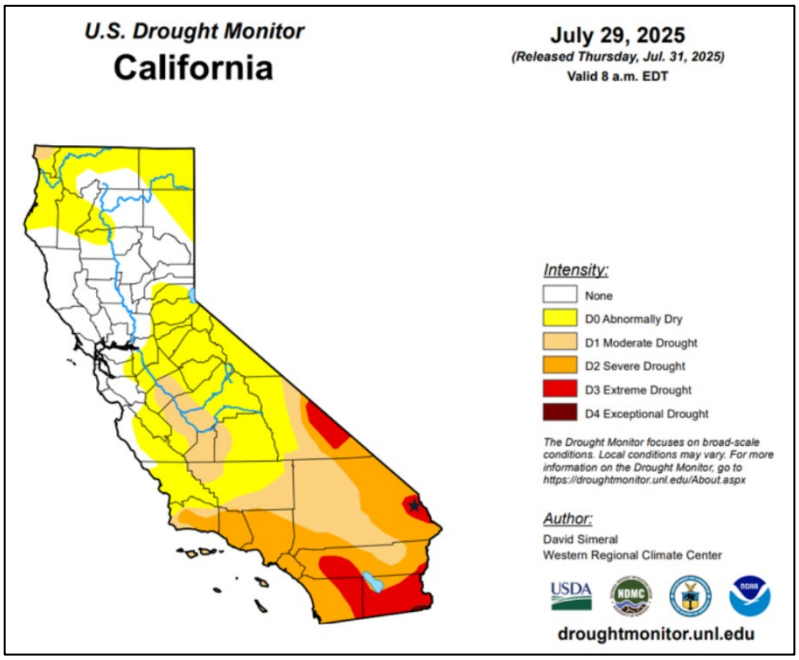
By the summer of 2014, almost all of California was experiencing D2 (Severe Drought) conditions. Needles, all of San Bernardino County, and more than 75 percent of California were reported to be experiencing the most intense drought conditions, D4 (Exceptional Drought). By 2015, emergency water-saving mandates were enacted, requiring all jurisdictions to reduce water use by at least 25 percent. In late 2016 and early 2017, successive heavy rains helped end the drought conditions in the state. The following winter, in late 2017 and early 2018, rains did not return in the same quantity, and slight drought conditions returned across California. This moderate drought again abated in late 2018 and early 2019 during the winter season when heavy rains ended any existing drought conditions.

In November 2022, the majority of the state was in D2 (Severe Drought) and D3 (Extreme Drought) conditions, with Central California falling into the D4 (Exceptional Drought) category. A series of atmospheric rivers that swept through California from December 2022 to March

2023, bringing more than 78 trillion gallons of water, eliminated the drought for most of the state.[23]

As of December 2024, about half of California is experiencing abnormally dry to extreme drought conditions. San Bernardino County is experiencing D0 (Abnormally Dry) to D3 (Extremely Drought) conditions. **Figure 3-5** identifies current drought conditions as of December 3, 2024.

Figure 3-5: U.S. Drought Monitor – California



Extreme Heat

Based on Cal Adapt's historical information (1950 through 2005), the city experiences five extreme heat days yearly. In 2022, California experienced one of the worst heatwaves it has ever experienced. From September 1st through September 9th, 2022, temperature records for September were shattered across the western portion of the United States, including Needles, where temperatures were reported as reaching 114° F. Prior to this, a heat wave in 1997 affected Southern California, causing 5 deaths. Temperatures in Needles reached 118° F during this event.

The County of San Bernardino has issued several high heat advisories between 2014 and 2020, as shown in **Table 3-12.**

[23] Rice, Doyle. "Trillions of Gallons Have Soaked California. Is This the State's Wettest Winter Ever?" USA Today, March 29, 2023. https://www.usatoday.com/story/news/nation/2023/03/29/californias-snow-rain-totals-explained/11525451002/.

TABLE 3-12: EXTREME HEAT EVENTS, 2014 TO 2020
Date
September 4, 2020
July 24, 2018
July 6, 2018
August 25, 2017
July 21, 2016
October 9, 2015
August 12, 2015
June 18, 2015
September 11, 2014
May 12, 2014

Severe Wind

There have been several strong wind events recorded around the City of Needles. Annually, the city is subjected to wind conditions that can cause significant damage to trees, buildings, and vehicles. While the effects of strong winds are often overlooked, it should be noted that in 2003, two deaths in Southern California were directly related to the fierce conditions. A falling tree struck one woman in San Diego. The second death occurred when a passenger in a vehicle was hit by a pickup truck cover launched by the Santa Ana Winds.

The following depicts some of these Santa Ana winds and other major wind events in the city, neighboring communities, San Bernardino County, and the surrounding region. Severe wind events have been and will continue to be a hazard of concern for the city.[24]

- **January 6-7, 2003** - Widespread regional Santa Ana winds in the region resulted in 2 dead, 11 injured, and widespread property damage, road closures, downed trees, crop damage, wildfires, and power failures.
- **November 2014** - A Santa Ana wind event caused winds of approximately 50 mph, with damage reported throughout the region.
- **August 12, 2014** – Severe winds and hail swept through Needles. Wind gusts reached over 60 mph, snapping approximately 50 power poles and trapping one motorist beneath live power lines.[25]
- **August 16, 2016** - Winds fanned the Blue Cut Fire, which spread rapidly, forcing 84,000 mandatory evacuations and threatening 35,000 homes. For two days, numerous roads

[24] National Oceanic and Atmospheric Administration. May 2017. "A History of Significant Weather Events in Southern California." https://www.weather.gov/media/sgx/documents/weatherhistory.pdf

[25] Steinberg, Jim. "High Winds, Hail Bash Needles, Snap Power Poles." San Bernardino Sun, August 12, 2014. https://www.sbsun.com/2014/08/12/high-winds-hail-bash-needles-snap-power-poles/.

were closed, including I-15, in both directions. The fire destroyed 105 homes and 313 smaller structures and scorched 36,274 acres before being extinguished.

- **January 2017** - A series of three storms caused strong winds that knocked down hundreds of trees throughout the region, causing millions of dollars in damage.

Thunderstorms

Needles and San Bernardino County as a region are no strangers to severe weather and thunderstorms. The following lists some recent major storm events in the surrounding communities and San Bernardino County.

- **August 29-31, 2021** – Thunderstorms brought severe winds and flash flooding. In San Bernardino County, 30 low water crossings on Highway 95 between Needles and Lake Havasu Road were covered in mud and debris, resulting in $50,000 in property damage.

RISK OF FUTURE EVENTS

Drought

Drought will continue to be a foreseeable event in the future of California, including Needles. Droughts in the area are expected to become more frequent and intense due to climate change. Droughts that result from infrastructure failure are equally impossible to predict since the circumstances that lead to infrastructure failure are unique to each situation.

Extreme Heat

As temperatures rise throughout California, the number of extreme heat days will also increase. According to Cal-Adapt data, which relies on NOAA data sources, Needles experiences extreme heat days. The city historically (1961-1990) experienced, on average, four extreme heat days annually based on this historic period. That number of days is predicted to increase to 14 days annually from 2035-2064. According to Cal-Adapt, the city is projected to experience an annual average of 37 extreme heat days by 2100.

Severe Wind

Given the region's history of severe wind events, it is very likely that wind events will continue to impact the city. The most probable source of wind events in the future will likely originate from extreme storms, such as thunderstorms brought by monsoons. All expectations are that the probability of severe wind events occurring again in the future is highly likely. As discussed in **Tables 3-2 and 3-3**, a "highly likely" probability indicates a greater than ten percent chance of severe wind events occurring annually.

Thunderstorms

There is no indication that thunderstorm hazards will abate either in Needles in the future. While Needles may experience prolonged periods of dry or wet years, all expectations are that the probability they will occur again in the future is highly likely and anticipated to increase in the future is highly likely. As identified in **Tables 3-2** and **Table 3-3**, the future probability for this hazard is more than ten percent chance each year.

CLIMATE CHANGE CONSIDERATIONS

Drought

Climate change is anticipated to abate drought in certain situations but, on the other hand, could also intensify and exacerbate it in other cases. In some cases, climate change-intensified weather patterns, like ENSO, may bring more rain to California and Needles, which would abate drought conditions for the State's affected parts. In other cases, climate change may also prolong the La Niña phase of ENSO, leading to longer dry periods with no precipitation in California.

Due to climate change, droughts are expected to become more frequent and intense in San Bernardino County and, more broadly, throughout California by mid-century. Scientific studies indicate:

- Climate change is projected to drive more frequent historically warm temperatures, reduced precipitation and snowpack, abnormally dry soils, and, in turn, drought conditions.
- Modeling studies attribute more frequent coincident warm and dry years and more severe drought conditions in Southern California due to climate change.
- The incidence of extremely dry years (those occurring in 1 out of every 100 years over the historical period) could triple by the end of the century.
- The likelihood of long-duration droughts in San Bernardino County would increase significantly, with some studies showing a more than 80% chance of multidecadal drought by the end of the century.[26]

Climate change is also expected to increase the average temperature and cause more frequent and prolonged heat waves in California and Needles. During these events, water supplies may be diverted for cooling functions in the city. Hotter temperatures may also lead to increased surface water evaporation, which could contribute to greater water consumption. If a drought were to occur during a future heatwave, it could place water supplies under strain.

From a regional perspective, warmer overall temperatures in California are anticipated to reduce statewide water supplies. Much of California's water comes from melted snow in the High Sierra, where mountain snowpack acts as a natural reservoir. As the average temperature grows warmer with climate change, the amount of precipitation that falls as snow is expected to shift towards rain. Precipitation as rain will not flow into reservoirs and aqueducts the same way snowmelt does. The natural water reservoirs created by the snowpack stay intact as the initial snowpack runoff begins in the early spring and ends in early to late summer, depending on the level of the snowpack.[27] The runoff from the snowpack can be managed due to the slow pace at which the snow melts; however, when rain occurs in place of snowfall, there is no significant way to collect the water and retain it because it falls much faster. As less snow falls, the amount

[26] San Bernardino County Vulnerability Assessment. https://wrcog.us/DocumentCenter/View/7477/San-Bernardino-County-Vulnerability-Assessment

[27] NASA. "World of Change: Snowpack in the Sierra Nevada." https://earthobservatory.nasa.gov/world-of-change/SierraNevada#:~:text=The%20snowpack%20on%20the%20Sierra%20Nevada%20has%20generally%20peaked%20and,reservoirs%20while%20recharging%20the%20groundwater.

of melted water from the snowpack in the Sierra Nevada will decrease, reducing the water flowing into the reservoirs and aqueducts that supply Southern California. If regional and local water agencies do not account for increased groundwater withdrawal, Needles and the San Bernardino County region could experience greater dependence on imported water.

Extreme Heat

The primary effect of climate change is warmer average temperatures. The hottest years on record have occurred since 2000, with 2016 and 2020 being tied.[28] As climate change accelerates in the 21st century, extreme heat events are anticipated to become more frequent and intense in the city. The projection is that extreme heat days could increase between 10 and 64 days annually by 2100, and the city can expect a shift in residential and business needs for cooling and addressing heat-related issues.

Severe Wind

Studies indicate that climate change may affect severe wind events in varying ways, but it is unknown whether the frequency and intensity of events may be some of those ways. As temperatures increase, the amount of energy available to fuel storms that can cause severe wind events is expected to increase.

Thunderstorms

Climate change is expected to alter rainfall patterns in Southern California, including Needles. As the climate warms, rain events are predicted to become more intense. Needles will likely experience more rain inundation events that lead to flooding and erosion and increase the threat of dam failure and other potential hazards within the community and surrounding area.

Infrastructure Failure (Energy Shortage, Power Failure [PSPS])

DESCRIPTION

Energy Shortage

An energy shortage is any shortage or interruption in the energy supply to end users. California's energy infrastructure is designed to cope with the State's highly variable conditions and frequent disruptions caused by wildfires, storms, and floods. Generally, power failures caused by these events are short-term and limited to regional impacts. System-wide outages or shortages caused by a major disruption in supply or transmission are of more concern. The analysis of energy shortage for this LHMP focuses on disruptions to electrical power supply.

[28] Rebecca Hersher and Lauren Sommer. 2020. "2020 May be the Hottest Year on Record. Here's the Damage it did." NPR. https://www.npr.org/2020/12/18/943219856/2020-may-be-the-hottest-year-on-record-heres-the-damage-it-did

Power Failure (PSPS Event)

An energy/power failure is an event that occurs within an electric power system when the total real or reactive power of the power plants in the system is insufficient to supply all consumers with electric power of the required quality. These events are considered a lifeline system failure. These failures or outages can be the primary hazard, or these events can directly result from another hazard, such as an earthquake, extreme weather event, or flood. These failures can also be in conjunction with other lifeline system failures such as natural gas, communication, drinking water, wastewater disposal, or transportation. Power failure can exacerbate and or create detrimental effects on these various operational and lifeline systems. For this hazard profile discussion, energy/power failure incidents are the primary hazard of concern; however, power failure associated with other hazard events is a concern for many of the other hazards profiled in this plan.

Generally, these power failure events are the direct result of events beyond the control of the City. These events often occur during a time of extreme demand/need for power, such as an extreme heatwave that creates an enormous strain on the power grid as residents try to stay cool. Most of these energy outages are short-term but can last for weeks if the situation is dire. There are three (3) types of power failures or outages; each of them is categorized based on duration and the actual effect of the failure/outage event:

1) **Permanent** - A massive loss of power typically caused by a fault on a powerline; however, power is restored automatically once the fault has been cleared.

2) **Brownout** - A sag (or drop) in voltage in an electrical power supply. They can cause equipment or various operational systems to perform poorly.

3) **Blackout** - A total loss of power in an area; the worst form of a power failure. Blackouts can last from a few minutes to multiple weeks, depending on the nature of the causing event and the configuration of the actual electric network.

A Public Safety Power Shutoff (PSPS) is a practice that the three major electric providers in California (Southern California Edison (SCE), Pacific Gas & Electric (PG&E), and San Diego Gas and Electric Company (SDG&E)) and other utility companies may use to preemptively shut off power in high fire hazard areas to reduce fire risk during extreme and potentially dangerous weather conditions (hot, dry, and windy). The WAPA, which delivers energy to the City of Needles, can potentially conduct a PSPS event, especially in high wildfire risk areas.

LOCATION AND EXTENT

Energy Shortage

The city and surrounding areas are subject to energy shortages. Energy shortages can occur throughout the entire city. Shortages can vary in size and area of disruption for electrical services from a large area to a small number of service connections.

Power Failure

The entire City of Needles is vulnerable to energy/power failure. Most power failure events, as stated earlier, are not necessarily caused by humans. An overwhelming demand for power due to accidents, equipment malfunction/failure, weather conditions, or other natural hazards the

city is susceptible to can be the catalyst that creates a loss of energy/power. The Western Area Power Administration (WAPA) delivers energy to the City of Needles on a 69KVA transmission line. The distribution line crosses the river in town at 3240 Needles Hwy, the firehouse switchyard. The City of Needles also has a back 69KVA Line from the Nora McDowell Substation located 15 miles north of Needles.

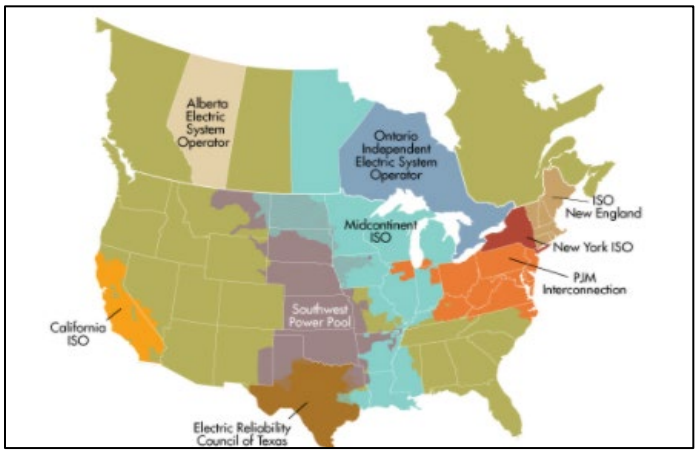
Power failure can occur in only small areas of the city, such as a single location or neighborhood, or the entire grid could fail, suddenly causing the entire city to lose power. Power failure is indiscriminate in who, where, or what it affects; however, locations with older infrastructure or infrastructure located above ground may be more susceptible to weather-related hazards. The duration of these power failures completely depends on the severity of the actual cause of the power loss and what is required to repair the issue or issues.

The electricity industry operated for years through "vertically integrated utilities," meaning that they owned generation, transmission, and distribution, which typically had monopolies in their designated service areas. In 1996, the Federal Regulatory Commission issued orders 888 and 889 requiring utilities with transmission infrastructure to provide nondiscriminatory access to all transmission customers. One way for a utility company to comply with this new requirement was to allow an independent system operator (ISO) to operate their transmission system for them. ISOs do not own the electricity transmitted over the grid, and they allow market participants to transmit electricity at the best available price. In 1998, because of Order 888 and CA state legislation AB 1890, the California ISO was incorporated as a nonprofit public benefit corporation to fulfill this mission. ISOs are often compared to air traffic controllers, as they independently manage the traffic on a power grid they do not own, much like air traffic controllers manage airplane traffic in the airways and on airport runways.

The California ISO is one of nine independent system operators in North America (refer to **Figure 3-6**). Collectively, they deliver over 2.2 million gigawatt-hours of electricity each year and oversee more than 26,000 miles of high-voltage power lines. These independent grid operators serve two-thirds of the United States.[29]

No PSPS circuits have been identified in the City of Needles.

Figure 3-6: All of the ISOs in North America



[29] California ISO website: "ISO History." http://www.caiso.com/about/Pages/OurBusiness/ISO-history.aspx

PAST EVENTS

Energy Shortage

Due to the especially high demand for electricity during the warmer months, energy shortage has occurred throughout the city, region, and state. Some recent events (within the last 10 years) include:

- **August 2020 (Statewide) –** California experienced rolling blackouts due to a record-breaking heatwave and high electricity demand. Though not widespread in Needles, the city was placed on Flex Alert status and was at risk for rotating outages.
- **Summer 2016–2024 (Needles, CA) –** Multiple small-scale outages occurred in residential areas during peak summer months due to transformer overload and heat-related equipment failures.
- **Ongoing PSPS (Public Safety Power Shutoff) Events –** Although Needles has not been a direct target of PSPS, regional utilities' wildfire prevention shutoffs have raised concern about future reliability during fire season.

Power Failure

Due to maintenance and infrastructure failure, small-scale power failure frequently occurs throughout Southern California. The city, region, and state has experienced several occasions where power has been lost due to human-caused errors and natural hazards. Energy failures and blackouts tend to occur on a larger regional scale, affecting Needles residents and businesses depending on the location of the failure. Some events within the last 40 years include:

- **December 1982** (near Tracy, California) - Loss of a transmission tower, two (2) 500-kV lines, and a pair of 230-kV lines. Five (5) million people were impacted. (Equipment Failure)[30]
- **October 1989** (Loma Prieta Earthquake) - Loss of substations; 1.4 million people impacted (Seismic Event)[31]
- **January 1994** (Northridge Earthquake) - Widespread power outages within the Lost Angeles region. Black-outs were also reported in seven western states, Mexico and Canada.[32]

[30] "The 3 Worst Power Outages in the History of the U.S".https://www.a-1-electric.com/the-3-worst-power-outages-in-the-history-of-the-u-s/#:~:text=On%20December%2022nd%2C%201982,going%20without%20electricity%20for%20hours.

[31] Eguchi, R. T.; Seligson, H. A. (1994), "Lifeline perspectives" Practical lessons from the Loma Prieta earthquake, National Academies Press.

[32] "The January 17, 1994 Northridge Earthquake: Effects on Electric Power and Selected Industrial Facilities." EPRI, April 22, 1997. https://www.epri.com/research/products/TR-106635#:~:text=The%20Northridge%20Earthquake%20was%20the,experienced%20the%20highest%20ground%20motion.

- **August 1996** (region) - Cascading impacts from loss of power from 1996 North American Blackouts[33]
- **December 1998** (San Francisco) - Loss of substations, impacting 350,000 buildings and 940,000 people. (Infrastructure failure, human error)[34]
- **2000** (statewide) - Power failures due to electricity crisis.[35]
- **2011** (Southwest Blackout) - Cascading impacts from the loss of power from the 23 distinct events on 5 separate power grids impacted 1.4 million people. This was the largest power failure in California history.[36]
- **July 2017** (Los Angeles) - An explosion at a power plant caused widespread outages in San Fernando Valley.[37]
- **July 2018 (San Bernardino County)** – Severe monsoonal thunderstorms caused localized power outages in the tri-state area, including portions of Needles.

Risk of Future Events

Energy Shortage

Energy shortage events are expected to continue in Needles. As extreme heat becomes more frequent, the need for power will increase to cool homes and businesses, placing more of a demand on energy resources. As identified in **Table 3-2** and **Table 3-3**, the future probability of an energy shortage is possible, or between a one-tenth of a percent and a one percent chance each year.

Power Failure

Today, several mechanisms are in place to monitor, manage, and adapt to changing conditions and demands to help reduce and/or eliminate energy failures. California and regional departments (California Independent System Operator- Cal ISO, Federal Energy Regulatory Commission- FERC, Western Electricity Coordinating Council- WECC, North American Electric Reliability Corporation- NERC, California Public Utilities Commission- CPUC, California Energy Commission- CEC) are focused on energy production, use, and management. Each agency plays a role in planning, managing, and coordinating the allocation of energy within the state of California. Needles can experience a power failure anytime and anywhere throughout the year.

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[33] *Venkatasubramanian, Mani V. (2003-08-20)* "Analyzing Blackout Events: Experience from the Major Western Blackouts in 1996."

[34] "Technician's error caused 1998 outage" https://www.sfgate.com/bayarea/article/Technician-s-error-caused-1998-outage-1-death-2595806.php

[35] Sweeney, James L. 2002. "The California Electricity Crisis: Lessons for the Future." https://www.nae.edu/Publications/Bridge/OurEnergyFuture/TheCaliforniaElectricityCrisisLessonsfortheFuture.aspx

[36] Medina, Jennifer (September 10, 2011) "Human Error Investigated in California Blackout's Spread to Six Million". The New York Times. https://www.nytimes.com/2011/09/10/us/10power.html?scp=1&sq=blackout&st=cse

[37] Floyd, Annie. July 8, 2017. DWP Plant Explosion Causes Massive Power Outage In San Fernando Valley. Laist. https://laist.com/news/dwp-plant-explosion-causes-massive

The probability of it occurring again will always be present, as the city depends on electricity to function.

Climate Change Considerations

Energy Shortage

Energy shortages caused by other hazard types may be affected by climate change. Many energy shortage events are typically caused by some natural hazards (i.e., extreme heat, extreme cold). As discussed in the Severe Weather section, climate change is also expected to increase the number of extreme heat events in Needles. As higher temperatures create more energy demand, this effect may also increase the frequency and duration of energy shortage events.

Power Failure

Projections of changing climatic conditions through the end of the century suggest that the City should address future power failure concerns. Energy demands are not anticipated to increase significantly throughout the city (due to compliance with updated codes and requirements); however, electricity production occurs outside the city, reducing opportunities for Needles to be energy independent. To better address energy/power failure, Needles' current and future climate change mitigation and adaptation efforts should prioritize energy efficiency measures, generate energy locally from clean and renewable sources, and build reliability & redundancy using the latest energy storage and backup systems technologies.

Geologic Hazards (Expansive Soils)

Description

Expansive soil is a soil that can shrink or swell and thus change in volume. Volume increases or decreases result from changes in the moisture content of the soil. These soils will almost always contain some form of expansive clay mineral, such as smectite or vermiculite, which can absorb water and swell, increasing in volume. The opposite effect (shrinkage) occurs as the soil dries. The more water is absorbed, the greater the volume increases. For the most expansive soils, volume changes of 10% are common. The actual amount that the ground will swell or shrink is determined by the water content in the near-surface (active) zone.[38]

Many of our country's largest towns and cities, and therefore their local and residential streets, highways, services, and buildings, are founded on clay-rich soils and rocks. These expansive soils can prove to be a substantial hazard to construction and the design of structures due to the ability of the soils to shrink or swell with seasonal changes in weather and moisture, changes at the site such as leakage from water supply pipes or drains. Even changes to landscaping and how it is drained or following the planting, removal, or severe pruning of trees or hedges near structures can help to address structural damage associated with expansive soils.

[38] Jones L. (2018) Expansive Soils. In: Bobrowsky P., Marker B. (eds) Encyclopedia of Engineering Geology. Encyclopedia of Earth Sciences Series. Springer, Cham. https://doi.org/10.1007/978-3-319-12127-7_118-1

Residential homes and other single-story buildings, pavements, pipelines, and other shallow services, such as fiber optics, are especially vulnerable to soil expansion damage. They lack the flexibility of movement that other heavier multi-story structures have. Concrete construction such as driveways, sidewalks, asphalt roadways, or parking lots is also susceptible to damage because their lightweight nature extends over a relatively large area. Most new structures and improvements that adhere to current building standards and requirements incorporate expansive soil mitigation.

Location and Extent

According to the California Building Code (CBC) Section 1803.5.3, soils with an expansive potential of less than 20 are considered "non-expansive," and soils with an expansive potential of greater than 20 are considered expansive. The extent to which soil expansion is present in an area or site can be measured relies on the Expansive Soil Index (**Figure 3-7**), which identifies categories ranging from very low to very high.

Figure 3-7: Expansive Soil Index

Expansion Index- Expansive Potential Categorization	
0-20	Very Low
21-50	Low
51-90	Medium
91-130	High
>130	Very High

Engineers and other professionals use the expansion index, EI, as an indicator of the soil's swelling potential. It may also be used to determine the suitability of soil to satisfy requirements set by specifying agencies.

The EI test is not used to duplicate any particular field conditions such as soil density, water content, loading, in-place soil structure, or soil water chemistry. However, consistent test conditions are used to prepare compacted specimens so that data can be directly correlated.[39]

Expansive soils are found worldwide, and the United States is no exception. Every year, they cause billions of dollars in damage. According to the American Society of Civil Engineers, roughly 25% of all homes in the US have experienced damage from expansive soils. They estimate that expansive soils cause more damage, resulting in financial loss to homeowners than earthquakes, floods, hurricanes, and tornadoes combined.[40]

Expansive soils in Needles exist in areas that are in the floodplain. Most of the city is in the 100-year floodplain, and most of the city's downtown area is in the 500-year floodplain. See **Figure 3-8** for the FEMA 100-year and 500-year flood zones in Needles.

[39] ASTM International: "Standard Test Method for Expansion Index of Soils" https://www.astm.org/Standards/D4829.htm

[40] King, Hobart M. PhD. Geology.com "Expansive Soil and Expansive Clay" https://geology.com/articles/expansive-soil.shtml#:~:text=How%20Many%20Buildings%20are%20at,damage%20caused%20by%20expansive%20soils

Past Events

Given the presence of expansive soils in various parts of the city, the city and its residents could experience occasional damage to structures caused by these soils. The most vulnerable structures would be those built before adopting the City's building codes and standards that mitigate the effects of these hazards.

Risk of Future Events

The community's expansive soils will continue to swell and contract as they are exposed to water, become saturated, swell, and eventually dry out and contract, potentially causing damage as this occurs. As identified in **Table 3-2** and **Table 3-3**, the future probability of expansive soils is between a one percent and a one-tenth of a percent chance each year.

Climate Change Considerations

It is possible that expansive soils may be affected by climate change, as climate change is expected to bring about more frequent drought conditions and contribute to more intense storms like El Niño. These extreme conditions could further increase the intensity of the expansive soils, physical expansion, and contraction, potentially increasing damage throughout the vulnerable parts of the city.

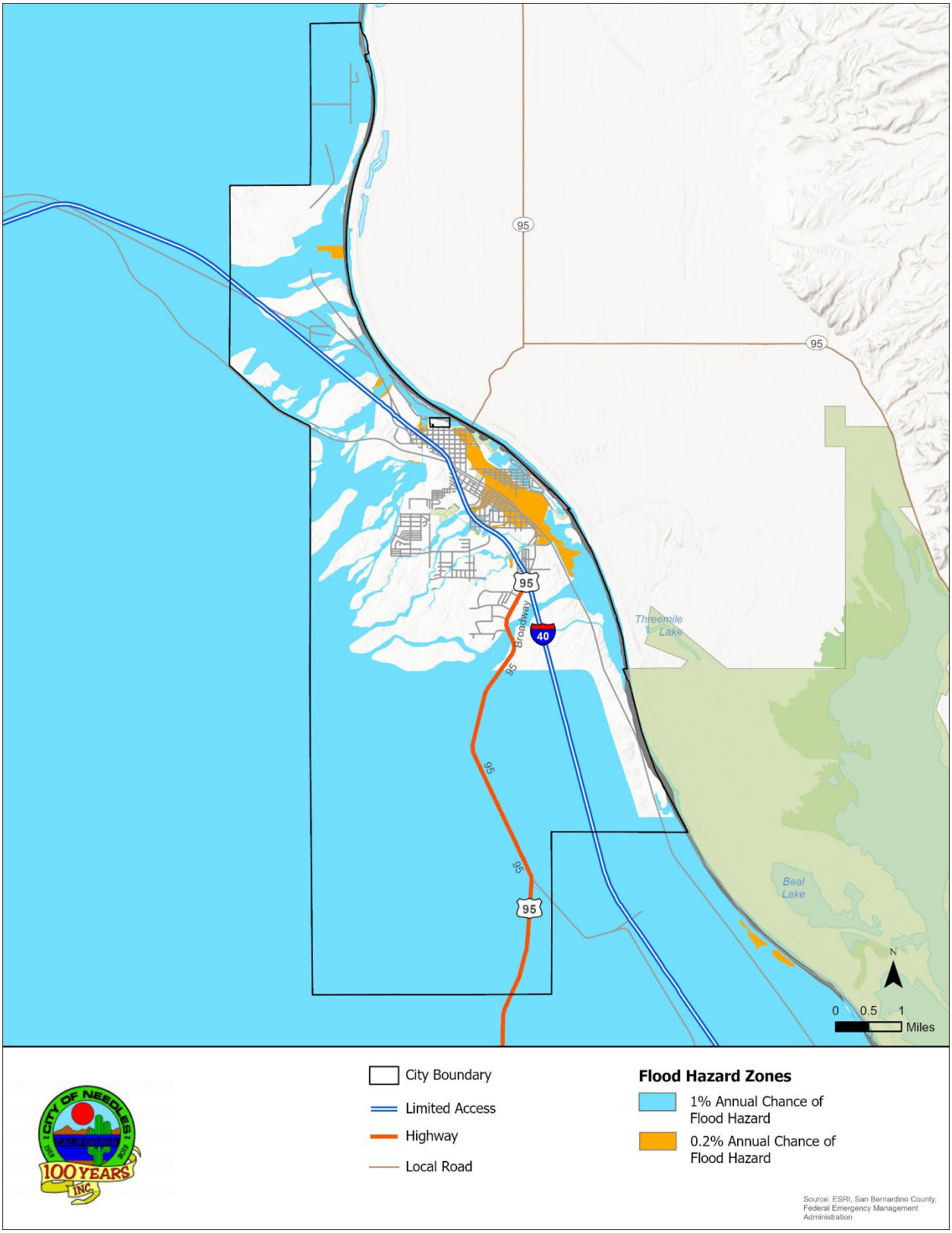
Flooding (Including Dam Failure)

Description

Flood

Flooding occurs when an area becomes inundated with more water than it can drain in a specified period. This can range from a small, confined area, such as a grassy field in a park that floods for a few hours after a rainstorm, to whole city sections, such as streets becoming impassable because of floodwaters. When floods are small, they may only represent a minor inconvenience as some recreational pathways and curb cuts become flooded. These smaller instances of flooding where water collects into a pool of standing water are called "ponding." On the other hand, larger flood events can hamper a city's operations. For example, if multiple streets flooded simultaneously, the results could prevent emergency workers from reaching people needing assistance. Flooding also has the destructive potential to damage critical infrastructure. For instance, unprotected electronic equipment can short-circuit if it becomes inundated by floodwaters. This could lead to outages in street lighting, traffic signals, and even City and government computer systems.

Figure 3-8: FEMA 100-Year and 500-Year Flood Zones in Needles



Flooding has the potential to occur from multiple sources. In Southern California, the primary cause of flooding is usually heavy rain occurring during the winter storm season. Most precipitation in California arrives either via atmospheric rivers or the ENSO cycle. Atmospheric rivers are channels of moist air located high in the atmosphere. The ENSO cycle is a regional meteorological phenomenon in the southern Pacific Ocean consisting of ocean water and air temperature variations. These variations give rise to two distinct phases: El Niño, the warm and wet phase, and La Niña, the dry and cold phase. When the El Niño phase is active, California will likely receive higher than normal precipitation levels. These higher-than-normal levels of rainfall can quickly overwhelm the capacity of certain sections of land to drain the precipitation before the rainwater begins to pool effectively.

In Needles, flash flooding can occur. Flash flooding is a sudden flood of great volume, usually caused by heavy rain. Flash flooding tends to occur in the summer and early fall because of the monsoon rains and is typified by increased humidity and high summer temperatures. Flash flooding can cause roads and bridges to wash out, and the erosion of earthen channels and basins. Cities and towns often experience street closures for several days due to sediment transport and road damage.

A failure in infrastructure may also cause flooding. For example, a water main or sewage pipeline that bursts could cause flooding if left uncontained for a significant period of time. A more serious infrastructure failure, such as the failure of dams, reservoirs, or levees, could cause extensive flooding.

Dam Failure

Dam, reservoir, and levee failure can result from several causes, such as earthquakes, rapidly rising floodwaters, and structural design flaws. These hazards can occur instantaneously or very gradually, depending on the source of the failure. Inundation associated with these events can cause loss of life, damage property, and result in other impacts, such as displacement of persons residing in the inundation path and loss of critical infrastructure.

LOCATION AND EXTENT

Flood

The Federal Emergency Management Agency (FEMA) designates which areas in the United States are susceptible to flooding and how likely they are to experience flooding. FEMA uses a complex classification system to categorize the level of risk for each section of land. The two most well-known measures of flood event likelihood are the 100-year flood and 500-year flood zones. These designations do not refer to floods that occur every 100 or 500 years but to the likelihood of occurring yearly. For example, a 100-year flood zone has a 1 in 100—or 1% chance—of occurring in any given year, while a 500-year zone has a 1 in 500—or 0.2% chance—of occurring in any given year. These likelihood measures are combined with each locale's specific geography to produce specific flood “zone” designations. **Table 3-13** shows a detailed list of all the flood zone categories used by FEMA.

TABLE 3-13: FEMA FLOODPLAIN ZONES	
Zone	**Description**
A	Within a 100-year flood plain, but the water height of the 100-year flood is not known.
A1-30 or AE	Within a 100-year flood plain and the water height of the 100-year flood is known.
AO	Within a 100-year flood plain, and the water height of the 100-year flood is between one and three feet but not specifically known.
A99	Within a 100-year flood plain, protected by flood protection infrastructure such as dams or levees.
AH	Within a 100-year flood plain, and the water height of the 100-year flood is between one and three feet and is specifically known.
AR	Within a 100-year flood plain, protected by flood protection infrastructure that is not currently effective, but is being rebuilt to provide protection.
V	Within a 100-year flood plain for coastal floods, but the water height is not known.
V1-30 or VE	Within a 100-year flood plain for coastal floods and the water height is known.
VO	Within a 100-year flood plain for shallow coastal floods with a height between one and three feet.
B	Within a 500-year flood plain or within a 100-year flood plain with a water height less than one foot (found on older maps).
C	Outside of the 500-year flood plain (found on older maps).
X	Outside of the 500-year flood plain (found on newer maps).
X500	Within a 500-year flood plain or within a 100-year flood plain with a water height less than one foot (found on newer maps).
D	Within an area with a potential and undetermined flood hazard.
M	Within an area at risk of mudslides from a 100-year flood event.
N	Within an area at risk of mudslides from a 500-year flood event.
P	Within an area at risk of mudslides from a potential and undetermined flood event.
E	Within an area at risk of erosion from a 100-year flood event.

FEMA has designated most of Needles as lying within Zone “X,” generally meaning the city is not in danger of a 500-year flood; however, a significant amount of the downtown area does fall within the 500-year flood zone. The city is at risk of flooding due to surface drainage through the streets and storm drains. **Figure 3-8** depicts the city's 100-year and 500-year flood zones mapped by FEMA.

TABLE 3-14: FLOODING HOTSPOTS IN NEEDLES	
Location	**Problem Draining During Heavy Rains**
K Street Bridge	Flooding
Baliey Avenue (between J Street and Lillyhill Drive)	Flooding
Lillyhill Drive (between Bailey Avenue and Clary Avenue)	Flooding
Needles Highway (between Budweiser Road and Balboa Street	Flooding

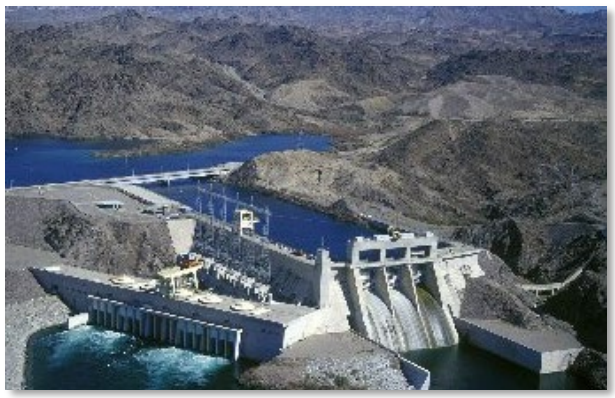
Table 3-15 identifies relevant data regarding Needles from the National Flood Insurance Program (NFIP).

TABLE 3-15: NFIP DATA FOR NEEDLES	
Total Number of Policies	13
Policy Characteristics	Residential Policies: 11 Business Policies: 2
Total Premiums	$12,624
Insurance in Force	Residential: $2,752,000 Business: $580,000 Total: $3,332,000
Total Number of Closed Paid Losses	Residential: 5 Business: 0
$ of Closed Paid Losses	Residential: $16,398 Business: $0
# of Repetitive Loss (RL) Properties	0
# of Severe Repetitive Loss (SRL) Properties	0
CRS Class Rating	N/A
Source: FEMA, 2024	

Dam Failure

The two dams that are a hazard to Needles are the Davis Dam and the Hoover Dam. If either dam were to fail, the damage to Needles would be catastrophic. The most extensive damage would be focused on the portions of the city along the Colorado River.

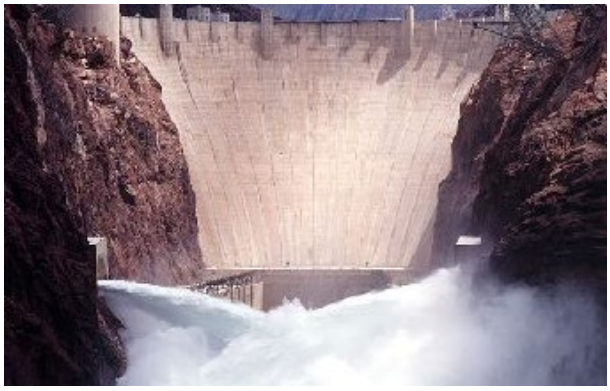
1) **Davis Dam** – Davis Dam is approximately 25 miles north of Needles on the Colorado River and approximately 67 miles downstream of the Hoover Dam. The Mexican Treaty of 1944 required the United States to construct Davis Dam to deliver water to Mexico. The reservoir formed by the dam, Lake Mohave, is used for that purpose through integrated operations of Hoover and Davis Powerplants. Davis Dam is 200 feet above the lowest point of the foundation and 140 feet above the level of the river. It is a zoned earth-fill structure with a concrete spillway, intake structure, and powerplant. The dam's crest length is 1,600 feet, and its top width is 50 feet. Its reservoir, Lake Mohave, has a total storage capacity of 1,818,300 acre-



Davis Dam
Source: Bureau of Reclamation

feet and, at maximum capacity, extends 67 miles upstream to the tailrace of the Hoover Powerplant.[41]

2) **Hoover Dam** – Hoover Dam is located approximately 105 miles north of Needles. Completed in 1935, the dam was built to protect Southern California and Arizona from disastrous flooding from the Colorado River and irrigate farm fields. It also supplies water and power to Los Angeles. The amount of concrete used to build the Hoover Dam was enough to pave a road from San Francisco to New York City. It is the highest concrete arch-gravity dam in the United States. The dam is located in the Black Canyon area of the Colorado River. It is a concrete thick-arch structure. The dam is 726 feet high and 1,244 feet long. It contains 3.25 million cubic yards of concrete. Its maximum storage is 30,237,000 acre-feet. Lake Mead, Hoover Dam's reservoir, extends 115 miles upstream. Lake Mead is one of the largest human-made lakes in the world.



Hoover Dam
Source: Bureau of Reclamation

Due to the large reservoirs associated with Davis Dam and Hoover Dam and the downstream location of the city in relation to these dams, dam failure or inundation of either of these dams could be catastrophic for the entire city and its residents.

PAST EVENTS

Flood

San Bernardino County is no stranger to flooding during massive storm systems and has experienced the destructive effects that occur as a result. Some flooding events have caused damage in the City of Needles in the past. San Bernardino County is no stranger to flooding during massive storm systems and has experienced the destructive effects that occur as a result. Some flooding events have caused damage in the City of Needles in the past. **Table 3-16** identifies past events of flooding in the city.

TABLE 3-16: HISTORY OF FLOODING IN NEEDLES

Date	Description and Effect
August 12, 2014	A strong storm brought 60 mph winds and heavy rain to the city. The thunderstorm produced flash flooding. The debris from the flash flooding closed Highways 62, 177, and 95 in both directions. Source: The Sun
August 22, 2016	A band of thunderstorms caused flash flooding in the city, pushing several vehicles off the highway. Flooding was reported on SR 95 near I-40. Source: AP

[41] U.S. Bureau of Reclamation. Projects and Facilities: Davis Dam. https://www.usbr.gov/projects/index.php?id=47

Dam Failure

There are no recorded dam failure events for the Davis Dam or the Hoover Dam.

RISK OF FUTURE EVENTS

Flood

There is no indication that the severe rainfall that leads to flooding will abate in the future, either in Needles or the greater region of Southern California. While San Needles may experience prolonged periods of dry or wet years, flood events will likely continue to impact the city. For areas within the 100-year and 500-year flood hazard zones, the likelihood of flooding occurring annually is 1% and 0.2%, respectively.

Because the city is vulnerable to flooding during various storms and monsoons, it actively participates in the FEMA National Flood Insurance Program (NFIP). Through this program, “Special Flood Hazard Areas” within the city are identified and mapped on Flood Insurance Rate Maps (FIRMs), identifying the areas that require flood insurance. FIRMs generally describe flooding in terms of a 100- or 500-year flood event, which translates into the probability (1.0% or 0.2%, respectively) that flooding could occur within the designated zone in any given year. In addition to the federal requirements within the NFIP, the City has adopted flood protection standards requiring minimum building elevation, flood-proofing, and anchoring of buildings in areas prone to flooding. **Figure 3-6** identifies the FEMA Flood Hazard Zones mapped within the city.

The City of Needles works with San Bernardino County on flood management and mitigation projects. The City also takes steps on an annual basis to maintain and prepare for flood events, ensuring the existing infrastructure can effectively convey floodwaters. Flood events within the city can occur either due to large storms and flash flooding that overwhelms infrastructure or the failure of flood control facilities that inundate downstream communities.

Dam Failure

Due to the presence of the two dams near Needles, the city is at risk of inundation in the case of significant dam failure. The potential consequences of dam failure are death or injury, people being displaced from their homes, damage to existing public and private buildings, damage to infrastructure, loss of services from utilities, loss of government services, and economic losses. The U.S. Army Corps of Engineers (USACE) evaluates and rates dams based on confirmed or unconfirmed safety issues, the probability of failure, and the potential consequences. The hazard potential classification indicates the potential hazard to the downstream area resulting from the failure or misoperation of the dam or facilities. It reflects the probable loss of human life and impacts on the economic, environmental, and lifeline interests. The hazard potential does not speak to the dam's condition or the risk of the dam failing. In this regard, the USACE has given both the Davis Dam and Hoover Dam a high-hazard potential classification.

Climate Change Considerations

Flood

Climate change is expected to exacerbate the conditions leading to flooding in Needles. Climate change will cause more intense local, regional, and global weather patterns, intensifying atmospheric rivers. Exactly how climate change will impact ENSO frequency is unknown, but its effects are anticipated to become more intense. Winter storm precipitation amounts in Southern California will increase based on atmospheric rivers and ENSO changes. This increases the likelihood of an exceptional rain event in Needles that could overwhelm the capacity of the region's flood control system to contain and drain all the precipitation.

Due to climate change, droughts are also expected to increase in length and frequency. Soils dried by extensive drought periods are less able to absorb and drain water, likely increasing flood possibility. Overall, climate change is expected to create conditions that will raise the likelihood of flooding in Needles.

Dam Failure

Climate change could increase the risk of dam failure in the future. More intense rainstorms may increase the likelihood of reservoir infrastructure becoming overwhelmed, including the dams that control floodwaters from inundating Needles and the rest of San Bernardino County. Indirectly, increased climate change-induced rains may cause more erosion, compromising the dam's structural integrity and the foundation on which it sits.

Human-Caused Hazards (Cyber Threat, Hazardous Materials Release, Natural Gas Pipeline, Transportation Accident)

Description

The Human-Caused Hazards profile discusses cyber threats, hazardous materials incidents, natural gas pipeline hazards, and transportation accidents.

Cyber Threat

Cyber threats are when an individual or a group threatens or attempts to disrupt the operations and functioning of computer systems belonging to private citizens, religious groups, educational institutions, government agencies, or businesses. These threats include online harassment, hacking, or in-person tampering with electronic equipment. Successful cyber threats can lead to service disruptions, infrastructure damage, and theft and may cause injury or death in severe instances.

Hazardous Materials Incident

The state of California defines hazardous materials as substances that are toxic, ignitable, or flammable, reactive, and/or corrosive. The state also defines hazardous materials as

substances that show high acute or chronic toxicity, are carcinogenic (causes cancer), have bioaccumulative properties (accumulates in the body's tissues), are persistent in the environment, or are water-reactive. The primary concern associated with a hazardous materials release is the public's short and/or long-term effects from exposure to the hazardous material.

Hazardous materials release refers to a hazard event whereby harmful concentrations of hazardous or toxic substances are released into the environment. This occurs when storage containers of hazardous materials leak or fail. This can happen due to industrial accidents, vehicle crashes, as a direct result of other disasters (e.g., a flood or earthquake), or as a deliberate act.

The threat that hazardous materials pose to human health depends on the type of material, frequency, and duration of exposure, and whether chemicals are inhaled, penetrate the skin, or are ingested, among other factors. Exposure to hazardous materials can result in short- or long-term effects, including major damage to organs and systems in the body or death. Hazardous waste is any material with properties that make it dangerous or potentially harmful to human health or the environment and is no longer of use requiring disposal. Hazardous materials can also cause health risks if they contaminate soil, groundwater, and air, potentially posing a threat long after the initial release.

Natural Gas Pipeline Hazard

Natural gas pipelines primarily serve to move gas from the point of origin (production/storage well) to the point of consumption. Inter- and intrastate pipelines transport natural gas produced from gas fields, either onshore or offshore, through gathering systems to commercial, residential, industrial, and utility companies. The pipelines are usually constructed of carbon steel and vary in size from 2 inches (51 mm) to 56 inches (1400 mm) in diameter, depending on the type of pipeline.

Transportation Accident

A transportation accident is a crash or other failure involving a vehicle, including a car, truck, or train. This can result from the vehicle operator making an error or environmental conditions that prevent the vehicle from being safely maneuvered. Examples of transportation accidents include automobile crashes, freight truck collisions, and train crashes or derailments. It should be noted that small-scale incidents, such as minor collisions between automobiles, would not count as a hazard. However, a large-scale collision involving multiple vehicles that shuts down a freeway could present a hazard to Needles because it could deter first responders from reaching victims or prevent residents from evacuating quickly.

LOCATION AND EXTENT

Cyber Threat

Since computers are so ubiquitous, a cyber threat could appear in virtually any part of the city. In extreme circumstances, a threat could impact the entire city. Cyber threats vary in their length and severity of impact. A minor threat could cause computer systems to slow down for a few minutes and not behave as responsively. On the other hand, a major cyber threat could cause a complete shutdown of critical systems, including those used by banks, healthcare institutions, universities, major businesses, and city governments.

Cyber threats are not measured on any scale, but they can be assessed by determining the following:

1) The type of incident (website defacement, denial of service, unauthorized surveillance)
2) The use of malicious software
3) The level of security countermeasures that failed to prevent the cyber threat
4) The duration of the cyber threat (a few hours, a few days, several weeks, etc.) [42]

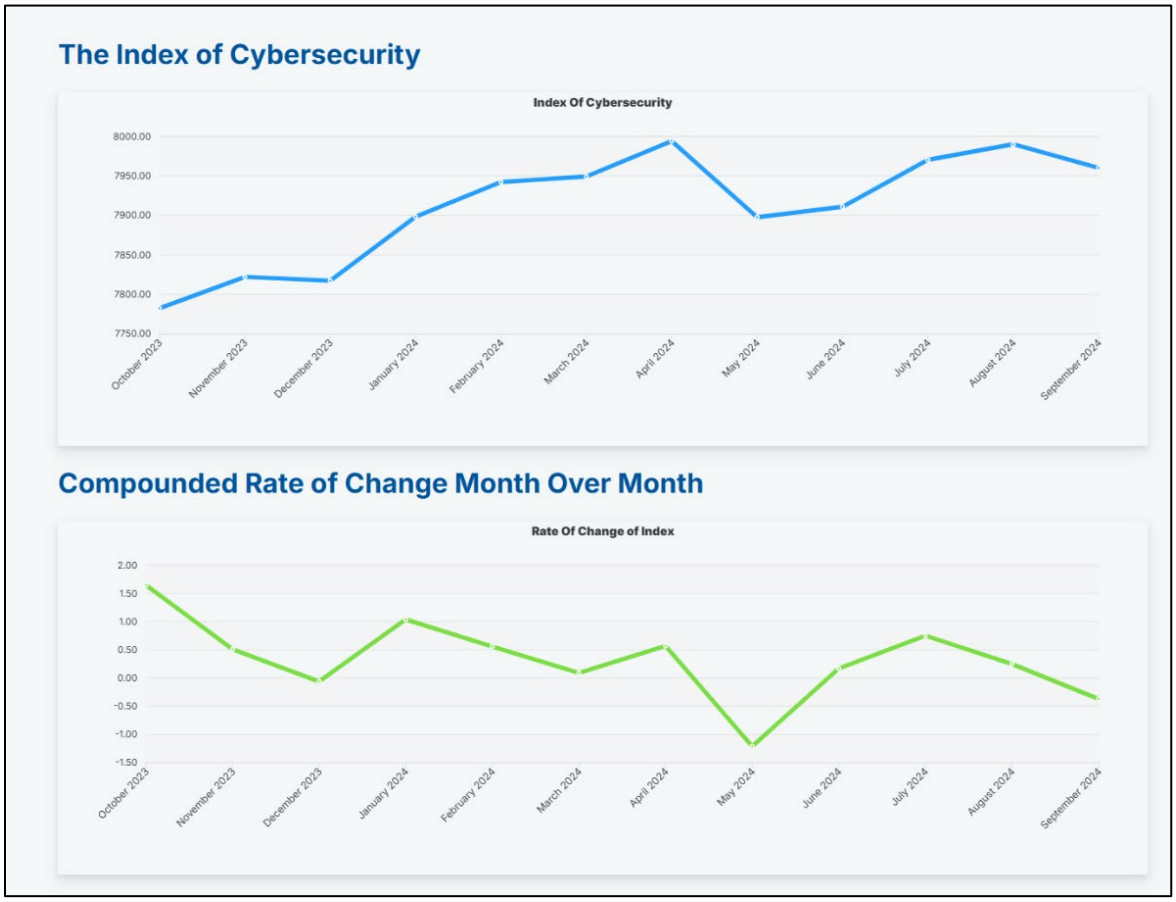
Globally, cyber threats are increasing and becoming more sophisticated. The most common types of attacks include:

- Phishing
- Ransomware
- Intellectual Property Theft
- Spyware/Malware
- Unpatched Software

The Index of Cyber Security (**Figure 3-9**) can be referenced to understand the status of cyber threats, which identifies the measure of perceived risk. Since 2015, this index has trended upward and appears to have doubled in this timeframe.

[42] Mateski, M., C. Trevino, C. Veitch, J. Michalski, J. Harris, S. Maruoka, and J. Frye. 2012. "Cyber Threat Metrics." *Sandia National Laboratories*. https://fas.org/irp/eprint/metrics.pdf.

Figure 3-9: Index of Cyber Security[43]



Hazardous Materials Incident

Hazardous materials and chemicals are used daily in households and businesses throughout Needles. In addition to the locations of large commercial and industrial uses, sources of hazardous materials can originate from seemingly harmless places such as gas stations, auto repair shops, dry cleaners, medical centers, and almost any industrial business. Hazardous waste can take the form of liquids, solids, contained gases, or sludge. It can be the by-products of manufacturing processes or simply discarded commercial products, like cleaning fluids and pesticides.

In severe situations, Needles may also be at risk of hazardous materials release events on a regional level. With the right prevailing wind conditions, airborne toxic material could spread to and impact various parts of the air basin, including areas of Needles.

Figure 3-10 identifies stationary hazardous materials locations within Needles that store, use, or produce hazardous materials regulated by the state. While these locations are fixed, roadways throughout the community are commonly used to transport hazardous materials and waste. These facilities are common locations for spills and releases. While there is no extent scale for hazardous materials release, the probability of an incident is anticipated to be occasional (less than 10% chance of occurrence) each year. Currently, the City has 296 facilities

[43] TAG Infosphere

registered with the Environmental Protection Agency (EPA). According to the California State Water Resources Control Board, there are a total of 31 sites in the city that require cleanup activity. Of these, 28 cases have been completed and considered closed. Of the remaining three, one site is currently in remediation, and two are under site assessment.

Natural Gas Pipeline Hazard

One natural gas pipeline is located north of the city in Willow Valley. Southern California Gas Company operates this pipeline. Most of the streets and roads within the city have natural gas lines. Four pipelines, approximately eight miles south of the city, cross the Colorado River along I-40. Based on the location of this infrastructure, any portion of the city has the potential for natural gas pipeline breaks that could expose businesses and residents to potential harm. **Figure 3-11** shows the natural gas pipelines in and around the city.

Transportation Accident

Arterial streets, highways, freeways, and railways are widespread in and around Needles. Major freeways passing through Needles include I-40 and US-95. Rail infrastructure runs through the center of Needles. Passenger and freight rail use this right-of-way, including Amtrak and Burlington Northern Santa Fe (BNSF). Any of these transportation corridors, or others in or around Needles, could be the site of a transportation incident that affects the community. Generally, transportation incidents are measured by the number of deaths they cause.

Figure 3-10: Hazardous Materials Locations in Needles

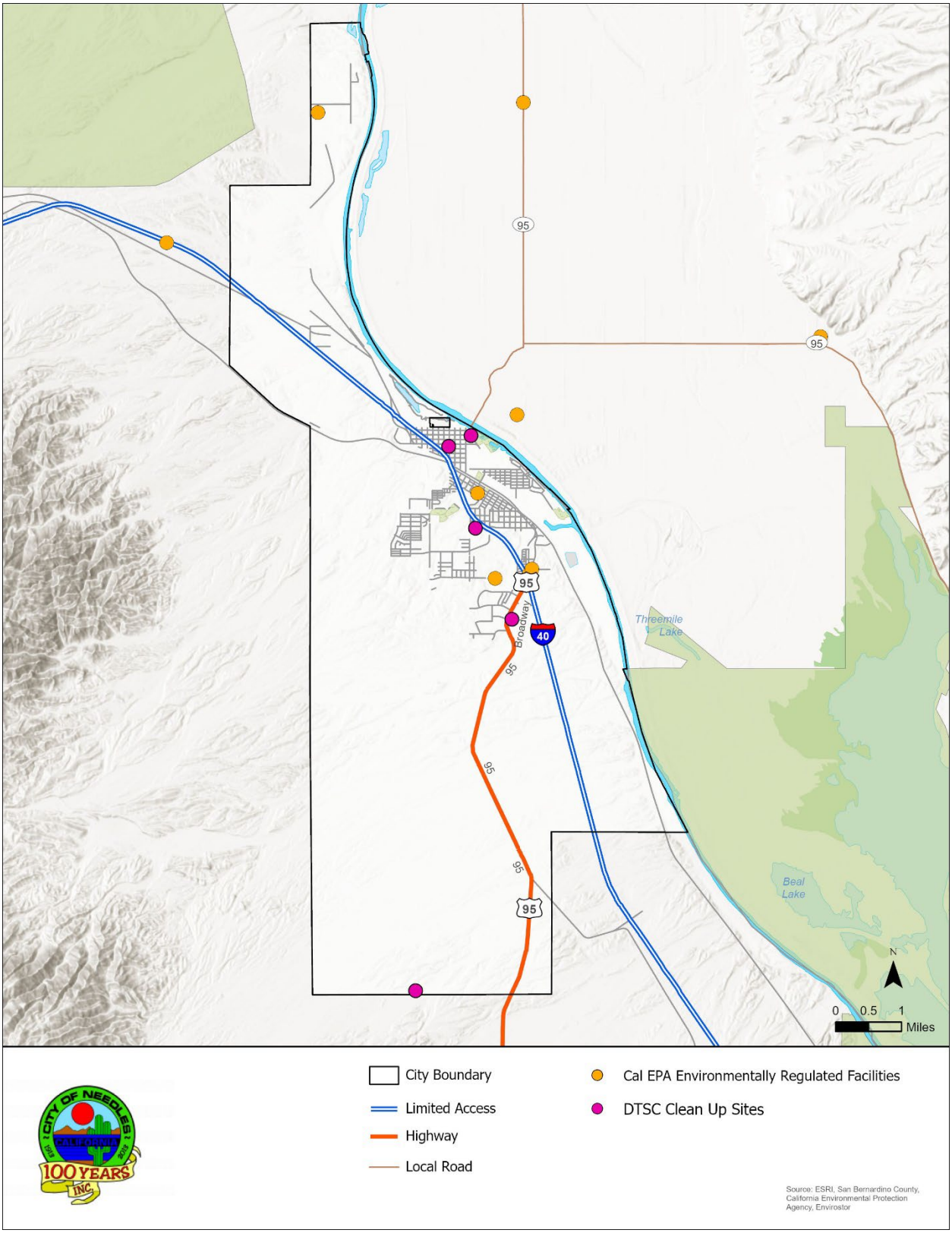


Figure 3-11: Natural Gas Pipelines Near Needles

PAST EVENTS

Cyber Threat

The City of Needles has not experienced any cyber incidents negatively impacting public services or safety. However, several jurisdictions in Southern California and across the country have. Several recent incidents local to the city include:

- **April 2023** – The San Bernardino County Sheriff's Department was hit with a cyberattack that likely started after someone clicked a malicious hyperlink. The Department recovered the data but shut down most of its systems, including email, internet, and many computers in its vehicles, out of precaution. County officials did not say if they paid a ransom for the data.[44]

In addition, other recent, notable cybersecurity events in the US include the Colonial Pipeline incident, JBS (the world's largest meatpacker), and the Washington DC Metropolitan Police

[44] McMillan, Rob. "San Bernardino County Sheriff's Department Shuts down Internet Systems Following Recent Cyberattack." ABC7 Los Angeles, April 23, 2023. https://abc7.com/san-bernardino-cyberattack-ransomware-hyperlink/13176620/.

Department. These attacks have resulted in the shutdown or delay in critical services and functions, increasing the cost of goods/services, financial losses, and operational delays.

Hazardous Material Incident

Needles has experienced an average of 13.93 hazardous materials spills reported annually to the Cal OES Spill Release Reporting database. **Table 3-17** displays this data. Most of these incidents involve the release of sewage and petroleum products.

TABLE 3-17: HAZARDOUS MATERIALS SPILLS REPORTED ANNUALLY IN NEEDLES

Year	Reported Releases
2010	10
2011	9
2012	10
2013	10
2014	16
2015	2
2016	12
2017	17
2018	22
2019	14
2020	15
2021	22
2022	20
2023	16
Annual Avg	**13.93**

Source: https://www.caloes.ca.gov/cal-oes-divisions/fire-rescue/hazardous-materials/spill-release-reporting

Natural Gas Pipeline Hazard

No natural gas pipeline accidents have occurred in Needles. According to the NTSB database, there have been two natural gas pipeline explosions/leaks of major relevance in California:

1) In 2010, the City of San Bruno experienced a huge explosion when one of Pacific Gas and Electric Company's natural gas pipelines exploded and caused an enormous fire. Eight people were killed in the explosion.[45]

2) The Aliso Canyon gas leak, called the Porter Ranch gas leak, was a massive natural gas leak in Aliso Canyon (near Los Angeles). A 7-inch well casing rupture caused a leak in an underground storage facility due to microbial corrosion from outside contact with

[45] Gonzalez, Sandra (September 11, 2010). "Search for bodies in deadly San Bruno PG&E gas line explosion ends". San Jose Mercury News. Retrieved September 11, 2010. https://www.mercurynews.com/2010/09/10/search-for-bodies-in-deadly-san-bruno-pge-gas-line-explosion-ends-2/

groundwater. Almost 100,000 tonnes of methane and over 7,000 tonnes of ethane were released into the atmosphere.[46]

Transportation Accident

There was a total of six fatality accidents in Needles from 2020-2024. Four of these events were caused by improper turning, one from an unsafe lane change, and one from a pedestrian violation. During the same time period, there were no major transportation accidents, (such as those resulting in a hazardous materials spill or mass casualty event.

RISK OF FUTURE EVENTS

Cyber Threat

Due to the integrated nature of technology into the everyday lives of Needles' residents, businesses, and government operations, it is possible that a cyber threat could emerge in the future. While no cyber threats are publicly known to have disrupted the City's normal operations in the past, the likelihood of a cyber threat affecting the residents, businesses, and/or governmental operations in the future is increasing. As identified in **Table 3-2** and **Table 3-3**, the future probability of cyber threat is highly likely, or greater than a 10% chance each year.

Hazardous Materials Incident

Most release events within Needles have occurred due to human error, malfunctioning equipment, or a deliberate act. Given this, future events within Needles are anticipated to include minor incidents like some of the past occurrences identified above in **Table 3-17**. Activities to prevent future releases, as well as response strategies, should take this into consideration. As identified in **Tables 3-2 and 3-3**, the future probability of hazardous materials release is likely, or between a one percent and ten percent chance each year.

Natural Gas Pipeline Hazard

The city and its residents rely on natural gas as a major means of heating and cooking within the home. As long as natural gas use continues within the city, the potential for risk will remain. Regular maintenance and inspections of these pipelines will be the best way to minimize the possibility of future release incidents. Activities to prevent future releases, as well as response strategies, should be taken into consideration. As identified in **Tables 3-2 and 3-3**, the future probability of hazards occurring from a natural gas pipeline is possible, or between a one-tenth of a percent and a one percent chance each year.

Transportation Accident

Transportation accidents will certainly continue. While guarding against such events and implementing safety measures is possible, preventing every transportation accident is impossible. The large volume of traffic on streets and highways in and around Needles makes it likely that an accident will occur on rail or highway transportation infrastructure in the future.

[46] Wilcox, Greg. August 28, 2017. "LA County declares state of emergency over Porter Ranch gas leak." Los Angeles Daily News. https://www.dailynews.com/2015/12/15/la-county-declares-state-of-emergency-over-porter-ranch-gas-leak/

As identified in **Tables 3-2 and 3-3**, the future probability of a transportation accident is possible, or between a one-tenth of a percent and a one percent chance each year.

CLIMATE CHANGE CONSIDERATIONS

Cyber Threat

Climate change is not likely to impact cyber threats in the future within Needles.

Hazardous Materials Incident

Climate-related natural hazard events, such as increased precipitation and subsequent flooding, could cause an increase in hazardous materials release. Some of these incidents could result from transportation crashes (due to poorer road conditions) or damage to storage containers or vessels containing these substances. Climate-related hazards could also exacerbate the effects and impacts of such events. For example, heavier rains could lead to more runoff from a contaminated site with hazardous materials. These issues should be monitored during the five-year implementation period of this plan.

Natural Gas Pipeline Hazards

Releases from natural gas pipelines are not anticipated to be affected directly by climate change. The location of this physical infrastructure is predominately underground within streets and easements throughout the city. Based on this location, the most likely impact of climate change would be the exposure of this infrastructure because of some other type of event. The most likely event would be erosion or some other event that could expose these facilities.

Transportation Accident

As mentioned in the severe weather profile, climate change is expected to alter rainfall patterns in Southern California, including Needles. As the climate warms, rain events are predicted to become more intense. Needles will likely experience more rain inundation events that lead to flooding and erosion, increasing the risk of transportation accidents. Additionally, heat stress on asphalt transportation corridors and railways could lead to an increase in transportation accidents. Heat stress can cause asphalt roads and railways to expand and deform. This leads to potential issues like rutting on roads and buckling or warping of rails, resulting in safety hazards like train derailments and reduced road lifespan due to increased damage from heavy vehicles.

CHAPTER 4 –
THREAT AND VULNERABILITY

Threat Assessment Process

The threat assessment process evaluates the harm Needles may experience from a hazard event. Threat assessment does not consider a hazard's likelihood, so it gives equal consideration to hazards that are more likely (e.g., earthquakes, drought) as well as hazards that are less probable (e.g., urban fire, dam failure). The threat assessment examines three aspects of each hazard: the physical threat to Critical Facilities (CFs) and Facilities of Concern (FOCs), the social threat to vulnerable populations, and the threat to any other assets.

Critical Facilities And Facilities Of Concern

Critical facilities consist of properties and structures that play important roles in government operations and their services to the community. Examples of CFs include local government offices and yards, community centers, public safety buildings like police and fire stations, schools, and any other properties a city has deemed essential for its operations. Critical Facilities may also serve dual roles if a city designates them as public assembly points during an emergency. The City often owns CFs, but many are also owned and operated privately, such as some utilities and telecommunication infrastructure. Facilities of concern are structures that play an important role in the city but are not critical to its function. These can be city-owned or privately owned facilities such as senior assisted living homes, parks, and storage facilities, to name a few.

The HMPC identified 10 CFs and 14 FOCs in Needles that fall into five different categories based on their function or characteristics. **Table 4-1** shows the number of CFs and FOCs in each category, the total estimated value of the facilities in each category, and examples of the facilities in each. **Appendix D** has a complete list of the CFs and FOCs. **Figure 4-1** displays the location of the CFs and FOCs in Needles.

The potential loss value is the total insured value of the CFs that fall within the hazard zone. It is intended to provide an estimate of a replacement cost if the property is completely or severely damaged. The actual repair costs could be smaller or larger than the provided estimate. The data relies on the City's Insured Asset Values, and therefore, information for facilities not owned by the City is not shown (e.g., bridges, private buildings). In some instances, replacement cost information was not made available. Where this occurs, "N/A" has been used within the table.

Based on the available data provided by the City, there is a minimum of $116,244,778 worth of City-owned assets. The greatest potential for loss among the city-owned assets comes from the infrastructure category. The next category with the greatest loss potential is the Public Works Facilities category followed by the City Facilities category. To better understand the magnitude of impacts, this plan identifies representative percentages of potential impact based on the total valuation of City assets. For planning purposes, it is reasonable to assume that impacts would not exceed 50% of the total asset value citywide.

The following are parameters to help understand how much a proposed investment/improvement compares to the existing assets within the city:

- **1% Impact** - $1,162,447
- **5% Impact** - $5,812,238
- **10% Impact** - $11,624,477
- **20% Impact** - $23,248,955
- **50% Impact** - $58,122,389

The likelihood that all facilities are completely damaged simultaneously is extremely remote. Most impacts are anticipated to be isolated to specific locations based on the hazard. This estimate does not include the value of underground infrastructure and surface drainage facilities owned and operated by the City.

TABLE 4-1: CRITICAL FACILITIES AND FACILITIES OF CONCERN

Category	Number of Facilities		Potential Loss
	Critical	Concern	
City Facilities (City Hall)	2	0	$5,405,100
Community Centers/Facilities	0	3	$4,347,000
Parks Facilities	0	13	$2,724,200
Infrastructure	29	0	$44,938,278
Public Works Facilities	1	8	$17,130,200
Medical Facilities (not City-owned)	1	0	$40,000,000
Fire Stations (not City-owned)	1	0	$1,500,000
Police Stations (not City-owned)	1	0	$200,000
Total	**35**	**24**	**$116,244,778**

* Based on the City of Needles insured replacement values

VULNERABLE POPULATIONS

Factors such as age, physical and/or mental condition, socioeconomic status, access to key services, and many other factors affect the ability of people to prepare for and protect themselves and their property from a hazard event. Even though some hazard events may equally impact all parts of Needles, people may experience the impacts differently. Higher-income households, for instance, are more likely to afford the cost of retrofitting their homes to resist flooding or move to a location that is less prone to flooding than a lower-income household. As a result, a higher-income household is less likely to experience significant damage during a flood event than a lower-income household, even if the same amount of rain falls on both.

A social threat analysis examines the ways hazard events are likely to impact different demographic populations in Needles and where these different demographic populations live in the city. This includes assessing whether the people in an area of an elevated hazard risk are

more likely than the average person to be considered a threatened population. The social threat analysis uses the following criteria to assess the threat to vulnerable populations:

- **Disability status:** Persons with disabilities may have reduced mobility and experience difficulties living independently. As a result, they may have little or no ability to prepare for and mitigate hazard conditions without assistance from others.
- **Income levels:** Lower-income households are less likely to have the financial resources to implement mitigation activities on their residences. Another challenge may be finding adequate time to research and access educational resources about hazard mitigation strategies. Furthermore, lower-income households are less likely to have the necessary resources to move to safer areas less at risk of being impacted by a hazard. The national poverty limit standard for the U.S. for a four-person family is approximately an income of $31,200 or less. For San Bernardino County, the FY 2024 Low-Income Limit for a four-person family, according to Housing and Urban Development (HUD), is $82,000
- **Seniors (individuals at least 65 years of age):** Seniors are more likely to have reduced mobility, physical and/or mental disabilities, and lower-income levels, all of which may decrease their ability to prepare for and mitigate a hazard event.

Table 4-2 shows the metrics for Needles residents who meet at least one of the criteria for threatened or vulnerable populations.

TABLE 4-2: NEEDLES THREATENED POPULATION METRICS

Threatened Population Metrix	Community-Wide Data
Population	4,900
Households	2,067
Median household income	$57,294
Renter households	48.0%
Percentage of households with at least one person living with a disability	59.3%
Percentage of households living under the poverty limit	27.4%
Percentage of households with one member aged 65+	36.3%
Area affected by Hazard (Sq Mile and Pct of city)	31.02 Sq Miles (100%)

Source: 2018-2022 U.S. Census Bureau's American Community Survey, 2024 U.S. Census Bureau's Estimates

The social threat analysis also shows the threat other populations may encounter. For example, people experiencing homelessness or people without access to lifelines (vehicles or communication networks) may experience greater hardship in evacuating or recovering from a disaster. Since data for these groups are not readily available, there is no definitive way to determine the number of persons in areas of elevated risk, so this assessment will discuss how these other threatened groups may also be affected on a general level.

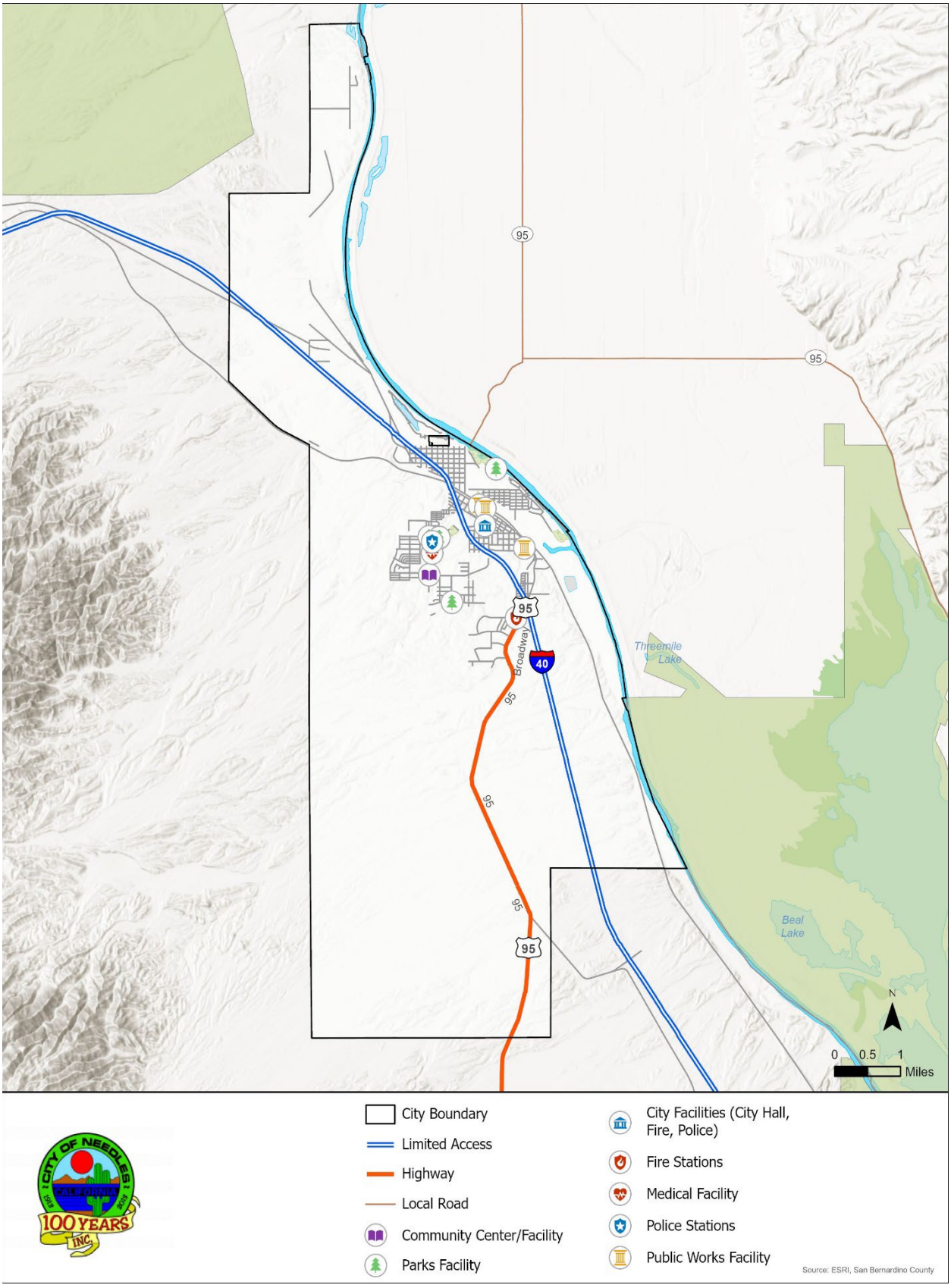
Data Limitations And Notes On Vulnerability Tables

Due to data limitations, the data comparing the hazard zone population with the citywide population comes from two separate sources. The citywide data comes from the US Census Bureau's American Community Survey (ACS), and the hazard zone population data comes from ESRI's Business Analyst reports. As a result, there may be minor discrepancies when comparing the two data sets. The data relies on available 2024 US Census Survey Projections and the 2018-2022 U.S. American Community Survey. **Chapter 2** identifies additional census-related information, which may differ from the data in this Chapter based on the data available for the analysis.

Other Assets

In addition to the City's designated inventory of CFs/FOCs and vulnerable populations, hazard events could threaten other important assets to Needles. These assets may include services, artistic or cultural landmarks, or local economic activities. Based on available information, the threat assessment describes the potential harm to these other assets.

Figure 4-1: Critical Facilities and Facilities of Concern



Threat Profiles

Earthquake Hazards (Seismic Shaking)

Physical Threat

Physical assets located in the eastern portion of the city are estimated to experience seismic shaking intensity between 0.1501g to 0.25g (shaking intensity in relation to the earth's gravity). These facilities could be damaged during a significant seismic event, which could be extremely costly for the City. If all facilities were damaged at the same time during a seismic shaking event, it can be assumed that the City would incur a percentage of the maximum potential loss of its physical assets. Assuming 20% of the City's assets are impacted, this potential loss could amount to over $23 million. Underground physical assets, like pipelines or utilities, could be damaged if the intensity of the seismic shaking is severe enough. In such a scenario, natural gas and water delivery service to Needles homes and businesses would not be available until repairs are completed. **Table 4-3** displays the potential scenario and losses incurred should shaking reach the described threshold. **Figure 4-2** displays the CFs (17) and FOCs (11) within the city's Seismic shaking potential hazard zones.

Table 4-3: Critical Facilities and Facilities of Concern (Seismic Shake 0.1501 to .25g)

Category	Number of Facilities		Potential Loss
	Critical	Concern	
City Facilities (City Hall)	0	0	-
Community Centers/Facilities	0	0	-
Parks Facilities	0	6	$2,024,700
Infrastructure	16	0	$20,605,399
Public Works Facilities	1	5	$15,999,700
Medical Facilities (not City-owned)	0	0	-
Fire Stations (not City-owned)	0	0	-
Police Stations (not City-owned)	0	0	-
Total	**17**	**11**	**$38,629,799**

* Based on the City of Needles insured replacement values

Social Threat

The risk of a seismic event is a danger to all Needles households and businesses; however, some populations are at higher risk than others.

Seniors, pregnant women, and persons with disabilities may be at higher risk in a seismic shaking event as they may have limited mobility, which could delay or prevent safe evacuation. Renters and persons with lower incomes are also more threatened by seismic shaking since they may live in homes that are not properly retrofitted to withstand the stresses of a seismic event. These groups may not have the financial resources to repair their homes or move to new housing if their homes become uninhabitable.

Data compares the populations within the seismic shaking hazard zones to the citywide population. Of the approximately 4,900 residents of Needles, approximately 26.7% or 1,310 residents live within the 0.1501 to 0.25g seismic shake zone. This equates to approximately 573 (approximately 27.7%) of the city's 2,067 households located in a potential seismic shaking hazard zone. **Table 4-4** displays these characteristics of threatened populations in this area, covering approximately 1.78 sq miles (5.7%) of the city, which include households with lower median household incomes, a lower percentage of persons living with a disability, and a higher percentage of households with one member aged 65+.

TABLE 4-4: SEISMIC SHAKE HAZARD THREATENED POPULATIONS

Threatened Population Metrics	Seismic Shaking (0.1501 to 0.25g)	City of Needles
Population	1,310	4,900
Households	573	2,067
Median household income	$55,655	$57,294
Renter Occupied Households	47.6%	48.0%
Percentage of households with at least one person living with a disability	54.5%	59.3%
Percentage of households living under the poverty limit	22.5%	27.4%
Percentage of households with one member aged 65+	47.3%	36.3%
Percentage of Needles Potentially Affected Area	1.78 Sq Miles	5.7%

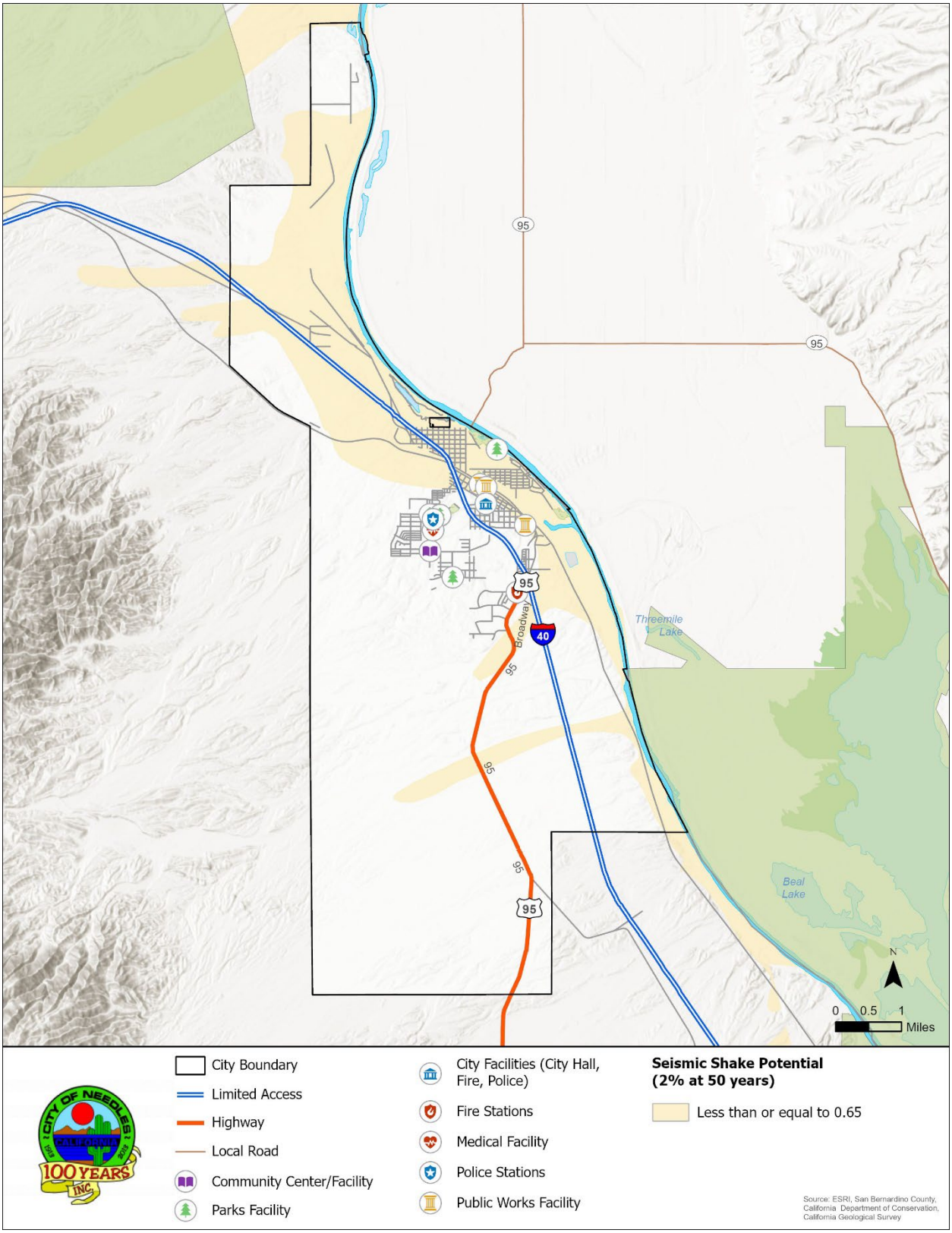
Other Threats

The goal of early earthquake warning systems is to afford utility providers additional time that they may use to shut off gas, water, and power transmission to try and control potential leaks following the event. Authorities may also have enough warning to halt the use of bridges or safely shelter or evacuate workers from hazardous locations. Therefore, the goal is to allow service providers to remain inactive, reducing further impact, until authorities determine it is safe for employees to return and reactivate utilities. The length of this time will vary depending on the event's magnitude. A significant earthquake would necessitate utilities to remain off for a few hours or several days. The city and the region could lose the economic activity that normally occurs. In addition, structures such as downed telephone poles or power transmission towers could block roadways and prevent first responders from reaching victims or evacuees who need assistance.

Changes in Population and Land Use Development

Based on the current Housing Element data, the city's anticipated residential/population growth over the next five years is not anticipated to increase Needles' vulnerability to earthquake-related hazards. While this may also be true concerning land use and development, if a strong earthquake impacts the city, there is the potential that older structures of the city may be impacted more severely than newer structures and developments in the city.

Figure 4-2: CFs and FOCs Located in Potential Seismic Shaking Hazard Zones



WILDFIRE

Physical Threat

Structures and physical assets in Needles that are not equipped with fire suppression technology or design features that mitigate fire vulnerability are at risk of fire. Generally, these buildings are older, may not be well maintained, and may not meet current code requirements and regulations. While wildland fires can impact all structures, older buildings may have increased vulnerability to these hazards.

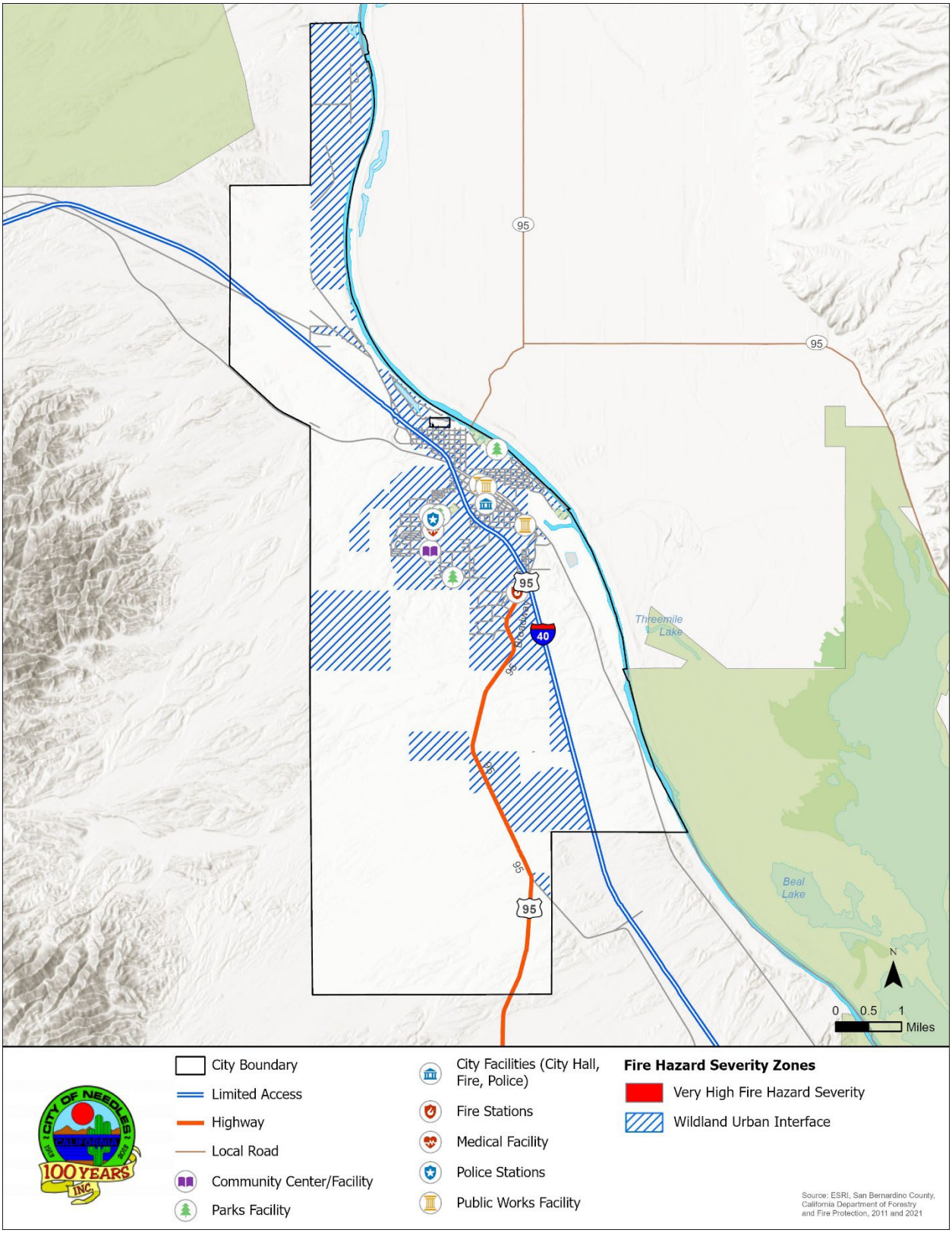
The California Department of Forestry and Fire Protection has no mapped Very High Fire Hazard Severity Zones (VHFHSZ) within the City's Local Responsibility Area (LRA) or the State Responsibility Area (SRA). The LRA is a government-designated area where a local agency, city, or county, NOT the State, is responsible for fire protection. An SRA is the opposite, where the State is responsible for wildland fire protection. The City of Needles does fall within a WUI. **Figure 4-3** identifies Needles' wildland-urban interface (WUI) area, including the CFs and FOCs, and historic wildfire perimeters in and around the city. **Table 4-5** identifies a combined total of 44 CFs and two FOCs within the WUI, which could result in a potential total loss of approximately $88 million. While these areas have a high degree of vulnerability to wildfire, other areas of the city may also be susceptible due to ember cast. Sometimes, the ignition of a wildfire may occur due to power lines located around overgrown trees, causing a spark and catching the tree on fire.

TABLE 4-5: CRITICAL FACILITIES AND FACILITIES OF CONCERN (WILDLAND URBAN INTERFACE)

Category	Number of Facilities		Potential Loss
	Critical	Concern	
City Facilities (City Hall)	2	0	$5,405,100
Community Centers/Facilities	0	3	$4,347,000
Parks Facilities	0	11	$2,528,000
Infrastructure	20	0	$33,135,278
Public Works Facilities	1	4	$1,300,000
Medical Facilities (not City-owned)	1	0	$40,000,000
Fire Stations (not City-owned)	1	0	$1,500,000
Police Stations (not City-owned)	1	0	$200,000
Total	**26**	**18**	**$88,415,378**

* Based on the City of Needles insured replacement values

Figure 4-3: CFs and FOCs Located in the Wildland Urban Interface (WUI)



Social Threat

A fire hazard immediately threatens seniors and people with disabilities. These groups may have limited mobility or diminished environmental awareness. For example, a senior who lives alone may not know if a fire ignites in their house until a room fills with smoke or a flashover occurs, at which point escape may be more difficult or impossible. Therefore, a fire that starts in or spreads to senior residences in Needles could be highly threatening to those populations. People with disabilities may require special mobility devices or caregiver assistance to evacuate, which may not be readily available when a fire occurs. Other groups with increased threat levels include lower-income people and renters. These individuals may live in substandard housing with outdated materials known to be flammable. Renters and lower-income persons may also live in housing units with improperly designed or unmaintained electrical or heating systems that could cause a fire. In the case of renters, these groups may not have the financial resources or authority to rebuild or relocate to new homes after a wildland or urban fire. Transportation-dependent populations are also at risk if evacuations become necessary and transportation services are suspended due to safety concerns.

Needles has a sizeable portion of its residents located within the Wildland Urban Interface (WUI). **Table 4-6** shows that approximately 94.7% of the city's population is within Needles' WUI. Of these households, approximately 59.8% have at least one person living there with a disability, 27.9% live under the poverty limit, and 35.7% have one member aged over 65+. These households also have a slightly lower median income than Needles as a whole.

TABLE 4-6: WILDLAND URBAN INTERFACE THREATENED POPULATIONS

Threatened Population Metrics	WUI	City of Needles
Population	4,642	4,900
Households	1,965	2,067
Median household income	$56,163	$57,294
Renter occupied households	49.0%	48.0%
Percentage of households with at least one person living with a disability	59.8%	59.3%
Percentage of households living under the poverty limit	27.9%	27.4%
Percentage of households with one member aged 65+	35.7%	36.3%
Percentage of Needles potentially affected area	8.67 sq miles	27.9%

Other Threats

Wildfires can consume power lines and force utility operators to shut off electrical and gas transmission activity, leading to utility outages in homes and businesses in Needles. Any streets surrounded by blazes or blocked by burning debris would hinder transportation, prevent residents from evacuating, and block emergency response crews from reaching the source of the fire. Anyone living towards the end of a cul-de-sac faces an elevated threat of being trapped if the fire occurs or spreads to the mouth of the street. Fires that destroy trees or vegetation (especially within parks and open space areas) could limit or prevent the use of these areas, affecting recreational opportunities for residents.

Climate Change Vulnerability

Climate change will likely increase the city's vulnerability to wildfire impacts because of increasing temperatures, which could change the moisture content of plant materials and potentially increase future drought conditions.

Changes in Population Patterns and Land Use Development

If a large wildfire were to occur, it is feasible that changes to population patterns could fluctuate. Future land use designations, re-development, or new development in these areas could be restricted or prohibited, especially in the WUI. Based on the current Housing Element data, the city's anticipated residential/population growth over the next five years is also anticipated to increase Needles' vulnerability to wildfire-related hazards.

SEVERE WEATHER (DROUGHT, EXTREME HEAT, SEVERE WIND, THUNDERSTORM)

Physical Threat

Drought

Since the primary threat from drought is reduced water supply and availability, there are no foreseeable threats to any of the City's physical assets. It is possible that any water delivery infrastructure not used or used less than usual may fall into some degree of disrepair if maintenance is deferred. Lower water pressures may cause some aged water pipes to release rust particles into the water supply. Amenities within facilities, like water features and landscaping, could be affected by reduced watering. If dead or dying vegetation becomes a nuisance, the City may have to replace or retrofit locations affected.

Extreme Heat

Extremely high temperatures can cause roads to deform and buckle as the pavement expands in the heat, especially in poorly maintained areas. Power lines and other electrical grid sections are less effective in higher temperatures and may be damaged due to stress during extreme heat events. Buildings with dark pavement will absorb more heat than surfaces with vegetation or lighter materials that are better at reflecting the sun's energy. This urban heat island effect is strongest during hot periods when the sun is strongest.

Severe Wind

Intense winds likely present the greatest threat to physical structures, particularly from trees or branches that fall on buildings and cause substantial damage. Older structures that have deferred maintenance or have not been retrofitted for high wind conditions may suffer greater damage than newer/updated structures. Utility lines and wooden utility poles face an elevated threat from wind, as do buildings without reinforced roofs.

Thunderstorms

There is no indication that rainfall or severe rain hazards will abate either in Needles or the greater region of Southern California in the future. While Needles may experience prolonged periods of dry or wet years, all expectations are that they will continue and increase in severity. Rain could damage structures with poorly constructed roofs and erode the soil around building

foundations. Heavy rain could also lead to flooding, damaging unelevated structures in flood zones.

Social Threat

Drought

Droughts are unlikely to cause serious social threats to households in Needles, though residents and business owners in the city may experience financial impacts associated with water conservation efforts. Those with less access to financial resources, such as low-income households or seniors, could be harder hit if higher water rates or additional fees are imposed during a severe drought event.

Extreme Heat

Whereas a heat event can be relatively harmless for those with a reliable means of staying hydrated and cool, the event can be deadly for others. Young children, the elderly, or people suffering from serious medical conditions are physiologically more vulnerable to heatstroke. Some senior citizens also take medicines that can make it harder for their bodies to maintain a safe internal temperature, creating an additional threat from extreme heat events. Young children may not be aware of the signs of dehydration or ways of protecting themselves from heatstroke.

People living in homelessness are at a high risk of health complications during heat waves, especially if they are unsheltered. According to Point in Time Count data performed by the County of San Bernardino, in 2023, there were approximately 4,193 individuals experiencing homelessness in the county, with approximately 24.6% unsheltered. Of the 4,193 individuals experiencing homelessness within the county, approximately 6 individuals are experiencing homelessness within the city. During a heatwave, these people are very vulnerable to heatstroke, especially if they cannot reach a cooling center.

Lower-income households living in substandard housing may not have functioning air conditioning or may be unable to afford to run their air conditioning even if it does work. Populations who work outdoors are also at risk of health effects from extreme heat.

Sudden spikes in heat can catch people by surprise. Stores can rapidly sell out of fans, air-conditioning units, or drinking water during a heatwave.

Severe Wind

Severe wind events can harm people throughout Needles but have a greater effect on the safety of people experiencing homelessness and people who work outdoors. Lower-income residents, who may not have the financial resources to purchase homes built or retrofitted to withstand powerful winds, could also have difficulty recovering from wind events.

Thunderstorms

Severe storms threaten any groups in Needles who cannot access adequate shelter. Homeless people often live in tents or other informal structures that may protect against minor rains but are inadequate against heavy rain events. Heavy rain can lead to flooding, which could inundate or sweep away informal dwellings. Additionally, vulnerable populations living in older homes with outdated building materials may experience damage during significant rain events. If

affected groups have limited incomes or lack the resources to make necessary repairs or maintain the structures, retrofit of these structures may be hindered.

Other Threats

Drought

A typical drought is not anticipated to lead to any outages in service in Needles. However, an exceptional drought may lead to restricted water use for residents or businesses in the city. Trees not adequately adapted to lower irrigation levels could perish, altering the city's aesthetic appearance and long-term air quality. Any open spaces with extensive lawns may start to die, turning brown, which could discourage residents from using these parks and open spaces. In addition, long-term drought conditions can change and reduce soil's ability to absorb water. When this occurs, water runoff from these areas may increase, which could cause downstream flooding and erosion in some areas. Vegetation that has dried out from a lack of water can lead to more dust and allergens in the air, leading to an increase in respiratory issues among certain vulnerable populations.

Extreme Heat

Extreme Heat for any length of time can also affect other hazards and risks within the city. For example, it can create a spike in electricity demand, leading to power loss/failure, food insecurities, and a rise in vector-borne disease transmission. Coupled with severe wind events, it can cause or spread wildfires and jeopardize additional neighborhoods/communities.

Severe Wind

The potential for severe wind events to create a financial strain on both the public and the City exists in the event of utility infrastructure damage or loss of power. These wind events can uproot trees and landscaping, further burdening the owners to replace or repair the losses. Trees located in City parks may also be damaged or destroyed. Air quality can also be affected by these wind events, stirring up dust, pollen, debris, etc. Another threat associated with severe wind is wildfire impacts (discussed earlier).

Thunderstorms

The potential for thunderstorms to create a financial strain on both the public and the City exists in the event of utility infrastructure damage and loss of power. Damage to roadway networks, including bridges, can interrupt effective transportation throughout the city, possibly hindering emergency equipment and first responder response capability. Major storm events can even impact the effectiveness of the evacuation capacity of the roadway network into and out of the city.

Climate Change Vulnerability

Drought

Climate change will likely increase the city's vulnerability to drought as climate change is expected to bring more frequent historically warm temperatures to the area as well as reduced precipitation and snowpack, and abnormally dry soils.

Extreme Heat

Climate change will likely increase the city's vulnerability to extreme heat impacts because of the anticipated temperature increase in intensity, duration, and frequency.

Severe Wind

Climate change will likely increase the city's vulnerability to severe wind impacts because of the increase in anticipated storm intensity and frequency and anticipated temperature increases.

Thunderstorms

Climate change and increased temperatures will likely increase the city's vulnerability to thunderstorms because of the anticipated alteration of rainfall patterns and the increase in anticipated storm intensity and frequency. Vulnerability to rain inundation events that lead to flooding and erosion and increase the threat of dam failure could also increase.

Changes in Population and Land Use Development

Drought

Droughts occur periodically (primarily during the Summer/Fall months) and generally do not affect populations to the degree that they would need to migrate in and out of the city. Drought is unlikely to have any significant effect on population growth.

It is unlikely that drought will affect land use and development because the development review process will take steps to mitigate or minimize the impacts and vulnerability of drought in Needles.

Extreme Heat

There could be minor changes in population patterns due to extreme heat if people cannot continue to live in older structures with limited insulation and older cooling units. The anticipated population growth in Needles is not expected to significantly impact the city's vulnerability to extreme heat. It is unlikely that extreme heat will affect land use and development because the development review process will take steps to mitigate or minimize impacts. However, it is possible that additional investment will occur in older parts of the city to modify structures to handle these conditions.

Severe Wind

Severe wind events occur periodically (primarily during the Fall months) and generally do not affect populations to the degree that they would need to migrate in and out of the city. It is unlikely that severe wind will affect land use and development because the development review process will take steps to mitigate or minimize the impacts of severe wind. There is the potential that older structures in parts of the city may be impacted more severely than newer structures within the city. Based on the current Housing Element data, the city's anticipated residential/population growth over the next five years will not increase Needles' vulnerability to severe wind events.

Thunderstorms

It is unlikely that thunderstorms will affect land use and development because the development review process will take steps to mitigate or minimize impacts from severe storms. Based on

the current Housing Element data, the anticipated residential growth in the city over the next five years will not increase Needles' vulnerability to thunderstorms.

Infrastructure Failure (Energy Shortage, Power Failure [PSPS])

Physical Threat

Energy shortages and power failures throughout the city can affect any CF or FOC at any time. Traffic control infrastructure, communications networks, and emergency services are just some critical services/infrastructure that can be disrupted during a power failure. Facilities such as police stations and fire stations are equipped with backup generators to ensure continuity of operations in the event of power failures; however, generators can sometimes fail. In addition, physical damage to systems could result from intermittent or unexpected power loss that damages electrical and computer equipment. These events could result from maintenance, isolated power failures due to equipment failure, or loss of power from infrastructure (powerlines, powerplants, transformers, sub-stations) failure.

Social Threat

Persons with health issues are more vulnerable to this hazard since they may rely on medical equipment that requires power. Vital medical treatments such as dialysis are at risk of being canceled or postponed if a medical facility does not have enough backup generator power to conduct appointments. If the power failure occurs during the warmer months, young children, the elderly, or people suffering from serious medical conditions are more vulnerable to heat-related complications if they are unable to relocate to a cooler location. Additionally, lower-income residents may be affected if the power failure lasts for an extended amount of time, as they may not be able to afford to replace the food spoiled from the loss of refrigeration. Additionally, private schools, preschools, residential care, and skilled nursing facilities located in this area are at risk of being impacted.

Other Threat

Older structures, electrical wiring and outlets may not meet current building code requirements, which could become damaged during power surges or damage the devices connected to them. In addition, many businesses and residents may not use proper equipment to help prevent power surges or loss, which can impact the functions and operations of businesses and City services or affect residents negatively. Given the potential for future power loss events, protective measures (improved outlets, ground fault circuit interceptor outlets, surge protectors, and backup battery (uninterruptible power supply) technologies should be promoted in any retrofits and improvements within the city. Current and future climate change mitigation and adaptation efforts in Needles should prioritize energy efficiency measures, generate energy locally from clean and renewable sources, and build reliability & redundancy using the latest energy storage and backup systems technologies.

Climate Change Vulnerability

While climate change has no direct link to infrastructure failure, the secondary effects can impact the city's potential vulnerability. Elevated temperatures, duration and intensity of

precipitation events, and extended drought conditions can strain the infrastructure within the city, potentially resulting in failure as demand for services rises.

Changes in Population Patterns and Land Use Development

Based on the current Housing Element data, the city's projected residential/population growth over the next five years is not anticipated to increase Needles' vulnerability to infrastructure failure. An increase in population increases the demand for utilities and power; however, Needles' projected population growth is unlikely to influence available infrastructure.

GEOLOGICAL HAZARDS (EXPANSIVE SOILS)

Physical Threat

Expansive soils can cause structures such as sidewalks and driveways to buckle and crack. The structure and foundation of buildings can become compromised by the swelling and shrinking behavior of these soils. **Table 4-7** identifies the 10 CFs and 3 FOC located within the expansive soils hazard zones.

TABLE 4-7: CRITICAL FACILITIES AND FACILITIES OF CONCERN (EXPANSIVE SOILS)

Category	Number of Facilities		Potential Loss
	Critical	Concern	
City Facilities (City Hall, Fire, Police)	1	0	$3,891,500
Community Center/Facility	0	1	$1,153,000
Parks Facility	0	0	-
Infrastructure	8	0	$16,483,500
Public Works Facility	1	2	$15,679,200
Medical Facility	0	0	-
Fires Stations (not City-owned)	0	0	-
Police Stations (no City-owned)	0	0	-
Total	**10**	**3**	**$37,207,200**

* Based on the City of Needles insured replacement values

Social Threat

Lower-income residents and renters may be more vulnerable to this hazard, as they may be unable to retrofit their residences or businesses to counteract the effects of expansive soils. **Table 4-8** identifies populations in the city threatened by expansive soils.

TABLE 4-8: EXPANSIVE SOILS THREATENED POPULATIONS

Threatened Population Metrics	High Susceptibility	City of Needles
Population	1,097	4,900
Households	507	2,067
Median household income	$51,502	$57,294

Renter occupied households	44.2%	48.0%
Percentage of households with at least one person living with a disability	55.4%	59.3%
Percentage of households living under the poverty limit	25.6%	27.4%
Percentage of households with one member aged 65+	38.1%	36.3%
Percentage of Needles potentially affected area	69.2%	

Climate Change Vulnerability

Climate change could indirectly increase the city's vulnerability to expansive soils impacts. Increased frequency and intensity of future storms may cause more flooding, exacerbating the impact of expansive soils.

Changes in Population and Land Use Development

Expansive soils are being monitored throughout the hazard-prone areas in the city. The impacts can cause damage to structures located within these zones; however, these zones are generally located in certain areas of the city, meaning that the damage potential is limited to these areas. Despite this potential, expansive soils are unlikely to cause changes in population patterns. However, land use designations and new development may be limited in these areas out of precaution or subject to any policies developed in City documents such as the LHMP, Land Use, Housing, and Safety Elements. The City's development review process will identify steps to mitigate or prevent damage from expansive soils. Based on the current Housing Element data, the city's anticipated residential/population growth over the next five years is not anticipated to increase Needles' vulnerability to expansive soils.

FLOODING (INCLUDING DAM FAILURE)

Physical Threat

Flood

Any physical assets within these mapped boundaries could be inundated if enough precipitation fell, exceeding the storm drain infrastructure design capacity in these areas. Electronic or mechanical equipment on the ground could become waterlogged and nonfunctional. Needles currently has 10 CFs and 3 FOC located within the mapped FEMA flood zones, representing a potential loss of over $37 million. **Table 4-9** depicts these statistics for the 100-Year and 500-Year FEMA Flood zones. **Figure 4-4** displays these FEMA Flood zones in relation to the City's CFs and FOC.

Dam Failure

Various factors, such as the amount of water released, the distance between the dam failure site, and the topography of the surrounding land, will influence the extent to which physical assets in Needles are threatened. Davis Dam and Hoover Dam have large storage capacities that could cause widespread inundation in Needles if the reservoir waters are released due to a dam breach. In a worst-case scenario, these dams could impact all CF and FOC in the city.

Figure 4-4: FEMA 100-Year and 500-Year Flood Zones

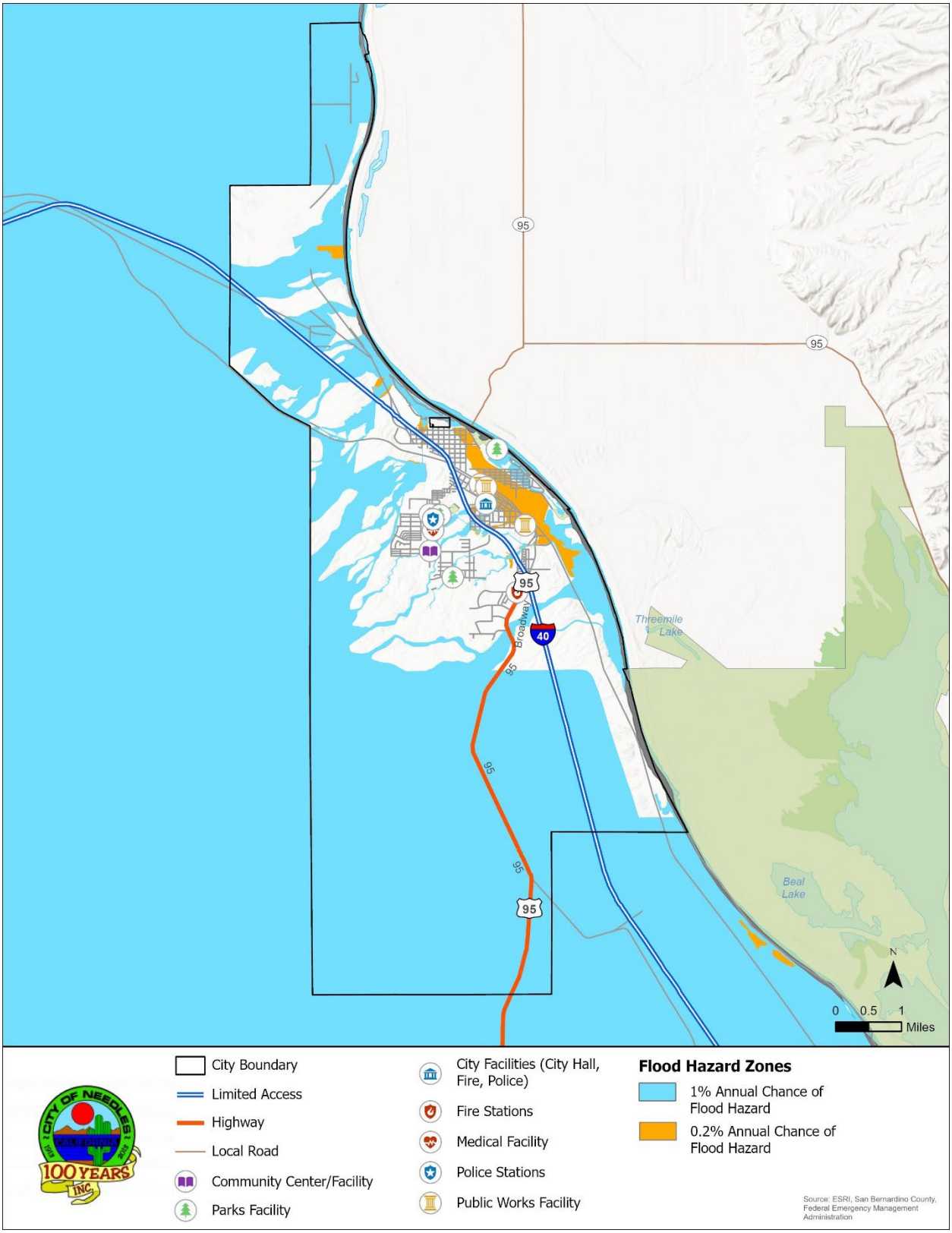


TABLE 4-9: CRITICAL FACILITIES AND FACILITIES OF CONCERN LOCATED IN FEMA FLOOD ZONES						
Category	100-Year Flood		Potential Loss	500-Year Flood		Potential Loss*
	Critical	Concern		Critical	Concern	
City Facilities (City Hall, Fire, Police)	0	0	$ -	1	0	$3,891,500
Community Center/Facility	0	1	$1,153,000	0	0	$ -
Parks Facility	0	0	$ -	0	0	$-
Infrastructure	6	0	$10,431,100	2	0	$6,052,400
Public Works Facility	0	0	$ -	1	2	$15,679,200
Medical Facility	0	0	$ -	0	0	
Fires Stations (not City-owned)	0	0	$ -	0	0	
Police Stations (no City-owned)	0	0	$ -	0	0	
Total	**6**	**1**	**$11,584,100**	**4**	**2**	**$25,623,100**

* Based on the City of Needles insured replacement values

**Replacement Values are unavailable as they are not City-owned.

Social Threat

Flood

Floodwaters in these areas, both the 100-year zone and the 500-year zone, are anticipated to rise to a depth of no more than one foot. Flooding of this type would likely inundate curb cuts and sidewalks to some extent. People who walk or bike as their primary form of transportation may encounter difficulties if they do not have access to an alternative means of transportation. Seniors, persons with disabilities, and low-income persons are also likely to be threatened. Additionally, persons experiencing homelessness who are outside during flood conditions may experience property damage or may not be able to access shelter. Though floodwaters in Needles are not expected to exceed a depth of one foot, six inches of floodwater may render any makeshift structures uninhabitable during a flood event. Possessions such as sleeping bags or electronic devices may be damaged or swept away by the floodwaters. **Table 4-10** shows that approximately 9.88% of the city's population is within the 500-yr floodplain. Of these households, the vulnerable populations represent approximately 65.8% of these households having at least one person living there with a disability, 39.7% of these households live under the poverty limit, and 37.1% of these households have one member aged over 65+; these households have a significantly lower median income than the city as a whole, and 55.6% of these households rent their homes.

Dam Failure

Dam failure hazards in the city would impact various downstream properties and the residents that live there. The greatest risk to the city and its population comes from the failure of Davis Dam and Hoover Dam, which due to the downstream location of the city and the size of the reservoirs, would affect the entire Needles population and inundate the entire city.

TABLE 4-10: FLOOD-THREATENED POPULATIONS			
Threatened Population Metrics	**Flood Hazard (100-year)**	**Flood Hazard (500-year)**	**City of Needles**
Population	613	484	4,900
Households	309	198	2,067
Median household income	$67,195	$35,810	$57,294
Renter Occupied Households	36.9%	55.6%	48.0%
Percentage of households with at least one person living with a disability	48.9%	65.8%	59.3%
Percentage of households living under the poverty limit	16.4%	39.7%	27.4%
Percentage of households with one member aged 65+	41.2%	37.1%	36.3%
Percentage of Needles potentially affected area	20.74 sq miles (66.9%)	0.7 sq miles (2.3%)	

Other Threats

Flood

Flooding may temporarily stop any type of transportation in the city. Debris from floodwaters can block roadways, hinder vehicle access, and potentially affect emergency response services. One foot of rushing water is enough to carry small vehicles. A severe flood may prevent people who own smaller vehicles from driving to work, reducing economic activity. Severe flooding that causes serious damage to homes and businesses may also reduce economic activity until repair work is completed.

Dam Failure

Dam failures are often triggered by other events (e.g., seismic shaking, intense rainstorms, etc.). There would most likely be service disruptions in Needles if this type of event occurred. Floodwaters could quickly inundate the city, disrupting utilities like water, power, heating, and other services such as communications or transportation infrastructure. Residents may find street lighting and traffic signals are temporarily disabled. Debris may be carried in the rapid inundation of water, blocking roads and impeding traffic flow. Water would likely inundate roadways and other low-lying, flat areas, such as parking lots, open spaces, and schoolyards. In severe scenarios, mobility in these areas would likely be restricted or impossible. Any unprotected or unhoused mechanical or electronic equipment not properly elevated would become waterlogged and inoperable until crews can conduct repairs or replacements.

Climate Change Vulnerability

Climate change will likely increase the city's vulnerability to flooding impacts because of the anticipated increase in the intensity and frequency of local, regional, and global weather patterns, intensifying atmospheric rivers. This increases the likelihood of an exceptional rain event in Needles that could overwhelm the capacity of the region's flood control system to contain and drain all the precipitation. Due to climate change, droughts are also expected to

increase in length and frequency. Soils dried by extensive drought periods are less able to absorb and drain water, likely increasing flood possibility. Climate change is expected to create conditions that will raise the likelihood of flood-related hazards (including Dam Failure) in Needles.

Changes in Population and Land Use Development

Given the current percentage of residents residing in FEMA flood zones, it is possible that flooding will affect the city's population patterns and growth. However, it is unlikely that flooding will affect land use and development patterns because the development review process ensures flood-related impacts are mitigated or minimized. Based on the current Housing Element data, the city's anticipated residential/population growth over the next five years is also anticipated to increase Needles' potential vulnerability to flood-related hazards (including dam failure).

HUMAN-CAUSED HAZARDS (CYBER THREAT, HAZARDOUS MATERIALS INCIDENT, NATURAL GAS PIPELINE HAZARD, TRANSPORTATION ACCIDENT)

Physical Threat

Cyber Threat

Cyber threats would have a limited impact on physical assets. The extent of this impact would focus on City-owned computers and network infrastructure.

Hazardous Materials Incident, Natural Gas Pipeline Hazard, Transportation Accident

Hazardous materials can cause damage to physical assets in Needles if they are released into the environment. Corrosive hazardous materials can damage the building exteriors of CFs or FOC. Flammable hazardous materials can start fires and cause any CFs or FOC nearby to flashover and ignite. Generally, sites closer to the origin for releasing hazardous materials are threatened greater than those further away.

Table **4-11** shows the numbers of physical assets in Needles threatened by a hazardous materials release within 500 feet of a site storing or using hazardous materials. There are 6 CFs located within 500 feet of a site with hazardous materials and 3 FOCs within 500 feet of a site with hazardous materials. The total potential loss estimated for these locations is over $24 million. **Figure 4-5** depicts these sites in relation to CFs and FOCs within the city.

Due to its flammable nature, natural gas can cause damage to physical assets in Needles if the pipelines are compromised. Natural gas can potentially start fires and may cause any CFs or FOC nearby to flashover. Generally, sites closer to the origin for the release of natural gas are threatened greater than those further away.

TABLE 4-11: CRITICAL FACILITIES AND FACILITIES OF CONCERN (HAZ MAT BUFFER 500 FT)

Category	Number of Facilities		Potential Loss
	Critical	Concern	
City Facilities (City Hall, Fire, Police)	1	-	$3,891,500
Community Center/Facility	-	-	-

Parks Facility	-	-	-
Infrastructure	5		$5,331,814
Public Works Facility	-	3	$15,224,700
Medical Facility	-	-	-
Fires Stations (not City-owned)	-	-	-
Police Stations (not City-owned)	-	-	-
Total	**6**	**3**	**$24,448,014**
* Based on the City of Needles insured replacement values			

Social Threat

Cyber Threat

Cyber threats may have an impact on residents and businesses throughout the city. While most cyber threats focus on large entities like major corporations and/or government agencies, all residents could become victims of cyber threats. If services affected by cyber incidents become delayed or are impacted, populations that rely on those services may be negatively impacted if no alternatives exist.

Hazardous Materials Incident

The threat of a hazardous materials release event affects those closest to a source of hazardous materials, including industrial sites, gas stations, gas transmission lines, or sewer mains. **Table 4-12** shows the city's vulnerable populations living within 500 feet of hazardous materials storage/waste sites. The median household income for these site types is less than the rest of the city. This suggests that more impoverished populations may live near hazardous materials locations, indicating potential environmental justice concerns should be considered. This data also suggests a higher percentage of households with at least one person living with a disability, living under the poverty limit, and living with at least one member aged 65+ live near these sites.

Groups such as older people, low-income persons, or renters face a greater risk of exposure since they may not have the financial resources necessary to retrofit their homes against infiltration by hazardous materials or move away to a home that is further from the potential sources of hazardous materials release events. Additionally, public and private schools, preschools, residential care, and skilled nursing facilities in this area are at risk of being impacted.

Needles residents living next to major transportation infrastructures, such as highways or major arterial streets, also face a greater threat of being affected by a release of hazardous materials since vehicles transporting hazardous materials may release their contents into the environment if involved in a collision. Specifically, residents in Needles living near the major transportation corridor running through the city (I-40 and U.S. Route 95) are at greater risk of exposure from a transportation-related hazardous material release than residents living in other parts of the city. **Figure 4-6** depicts the overall community health score for the city as analyzed by the California Office of Environmental Health Hazard Assessment (OEHHA) tool CalEnviroScreen. This mapping tool helps identify California communities that are most affected by many sources of pollution and where people are often especially vulnerable to pollution's effects. This tool

uses environmental, health, and socioeconomic information to produce scores for every census tract in the state. The scores are mapped so that different communities can be compared. An area with a high score experiences a much higher pollution burden than areas with low scores. **Figure 4-7** depicts the FEMA National Risk Index score for Needles. The National Risk Index is a data set and an online tool to help illustrate the United States communities most at risk for 18 natural hazards (including coastal flooding, cold wave, drought, earthquake, hail, heat wave, hurricane, ice storm, landslide, lightning, riverine flooding, strong wind, tornado, tsunami, volcanic activity, wildfire, winter weather); the italicized hazards are hazards that can affect Needles.

TABLE 4-12: HAZARDOUS MATERIALS THREATENED POPULATIONS (50 FT BUFFER)

Threatened Population Metrics	High Susceptibility	City of Needles
Population	1,310	4,900
Households	573	2,067
Median household income	$55,655	$57,294
Renter Occupied Households	47.6%	48.0%
Percentage of households with at least one person living with a disability	60.0%	59.3%
Percentage of households living under the poverty limit	29.9%	27.4%
Percentage of households with one member aged 65+	39.1%	36.3%
Percentage of Needles potentially affected area	1.78 sq miles (5.7%)	

Natural Gas Pipeline Hazard

The impacts of these incidents potentially threaten all groups in Needles; however, the extent of the threat would depend upon the type and magnitude of the event. As mentioned in the Hazardous Materials Incident discussion, groups such as older people, low-income persons, or renters face a greater risk of exposure since they may not have the financial resources necessary to retrofit their homes against infiltration by natural gas or move away to a home that is further from the potential sources of natural gas release events.

Transportation Accident

Needles residents living next to major transportation infrastructures, such as highways or the railroad, face a greater threat of being affected by transportation accidents since vehicles transporting hazardous materials may release their contents into the environment if involved in a collision. Specifically, residents in Needles living near I-40, SR-95, or the BNSF railway are at greater risk of exposure from a transportation-related incident than residents living in other parts of the city.

Figure 4-5: CFs and FOCs Located Near Hazardous Materials Sites (500 ft Buffer)

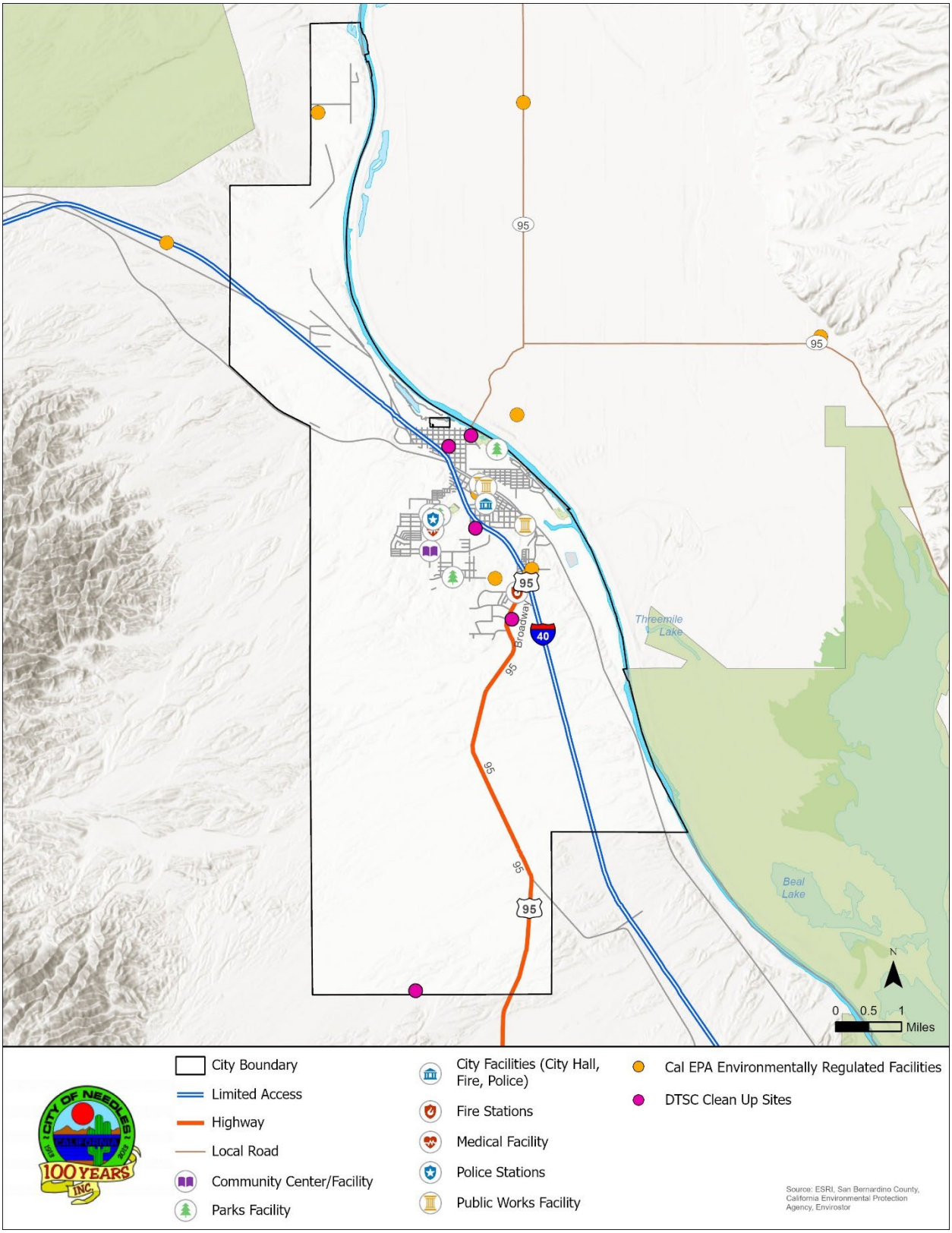


Figure 4-6: OEHHA CalEnviroScreen Rating for Needles

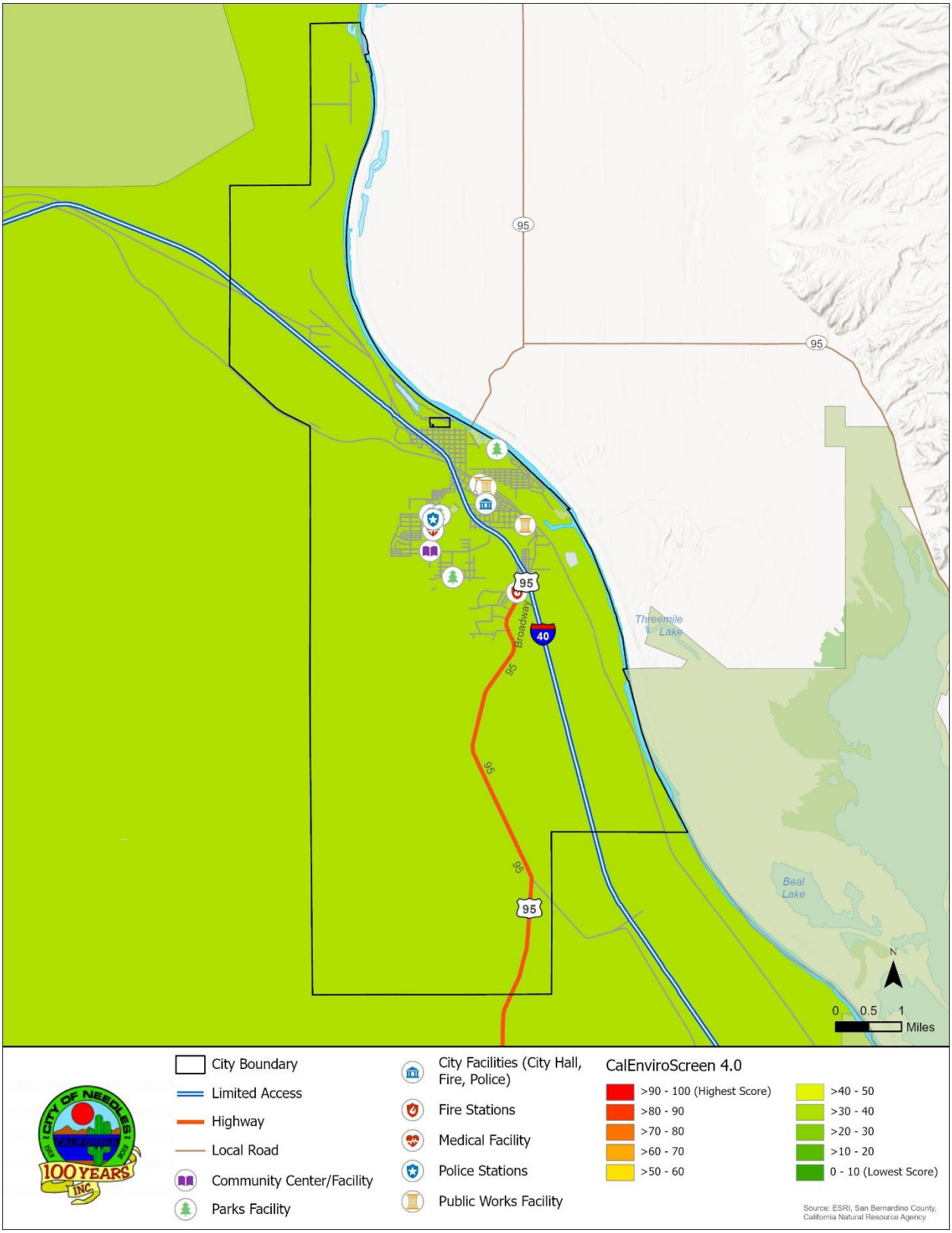
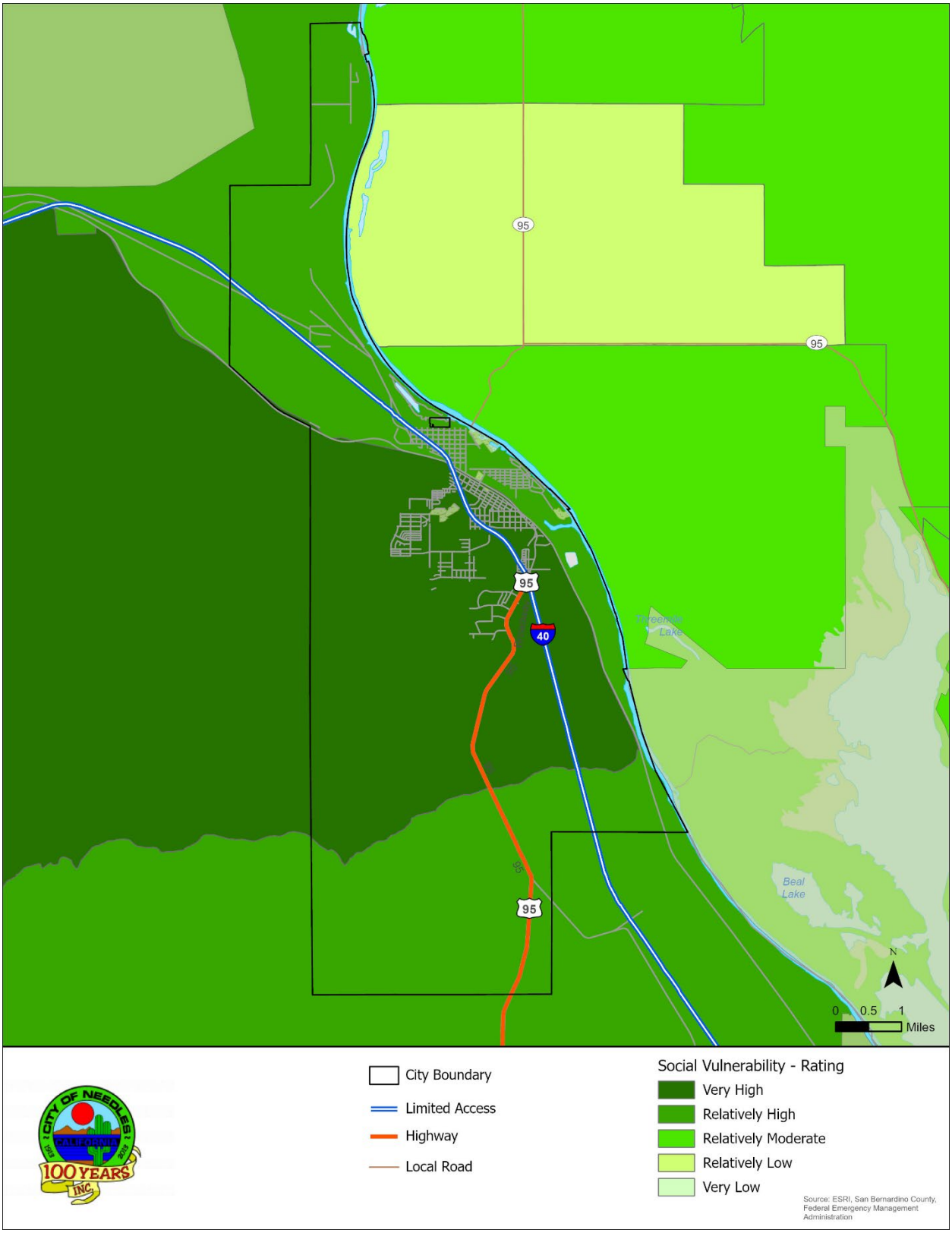


Figure 4-7: FEMA National Risk Index Scoring for Needles



Other Threats

Cyber Threat

The greatest impact a cyber threat could present to the city itself would be a complete shutdown of City services and programs. Electricity, gas lines, and water could be shut off for extended periods if a cyber threat compromised the control systems. Additionally, control over streetlights, traffic lights, and railroad crossings could be lost. To the average citizen, personal information, identity, and financial records could be stolen. As society becomes more and more technologically ingrained/dependent, the ever-evolving category of cyber threats will continue to change and grow in possible impact.

Hazardous Materials Incident, Natural Gas Pipeline Hazard, Transportation Accident

Any of these hazards could threaten the city's, and potentially the region's, transportation networks. Large areas of the local road may be closed to keep people away from areas contaminated with hazardous materials or natural gas leaks to allow remediation and cleanup activities to occur. If a highly corrosive hazardous material is released, it could potentially cause significant damage to the exteriors of any homes or businesses in the area surrounding the release. Hazardous materials could also harm the city's urban forest, resulting in the premature death of vegetation in the affected areas.

Climate Change Vulnerability

Cyber Threat

Climate change has no direct link to cyber threats and is not anticipated to increase the city's vulnerability at this time.

Hazardous Materials Incident

Climate change could indirectly increase the city's vulnerability to the impacts of a hazardous materials release as climate-related hazard events occur. Precipitation events with increased intensity causing flooding or overwhelming infrastructure could cause an increase in hazardous materials release. Climate-related hazards could also exacerbate the effects and impacts of such events. For example, heavier rains could lead to more runoff from a contaminated site with hazardous materials.

Natural Gas Pipeline Hazard

Releases from natural gas pipelines are not anticipated to be affected directly by climate change. The location of this physical infrastructure is predominately underground within streets and easements throughout the city. Based on this location, the most likely impact of climate change would be the exposure of this infrastructure because of some other type of event. The most likely event would be erosion or some other event that could expose these facilities.

Transportation Accident

Climate change is expected to alter rainfall patterns in Southern California, including Needles. As the climate warms, rain events are predicted to become more intense. Needles will likely experience more rain inundation events that lead to flooding and erosion, increasing the risk of transportation accidents. Additionally, heat stress on asphalt transportation corridors and railways could lead to an increase in transportation accidents. Heat stress can cause asphalt

roads and railways to expand and deform. This leads to potential issues like rutting on roads and buckling or warping of rails, resulting in safety hazards like train derailments and reduced road lifespan due to increased damage from heavy vehicles.

Changes in Population and Land Use Development

Cyber Threat

Cyber threats will not affect population patterns or land use and development, as no connection can be drawn between this hazard and changes in population patterns or land use and development.

Hazardous Materials Incident

A change in population pattern would only occur if a hazardous materials release was severe enough to require people to move. It is unlikely that hazardous materials release will affect land use and development because the development review process will take steps to mitigate or minimize impacts from a hazardous materials release event. Locations that store, produce, and dispose of hazardous materials are highly regulated within the city and monitored regularly. It is not anticipated that land use and development patterns will change through this process and the development review process. Based on the current Housing Element data, the city's anticipated residential/population growth over the next five years is not anticipated to increase Needles' vulnerability to hazardous materials release.

Natural Gas Pipeline Hazard

As the number of people, businesses, and traffic increases, so does the potential for an increase in hazards from natural gas pipelines. When population density grows, and land use development occurs near existing pipeline routes, new construction activities can inadvertently damage pipelines. However, based on the current Housing Element data, the anticipated residential/population growth in the city over the next five years is not anticipated to increase Needles' vulnerability to hazardous materials release.

Transportation Accident

A change in population and the anticipated growth patterns could affect the city's vulnerability. As the number of people, businesses, and traffic increases, so does the potential for an increase in transportation accidents.

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CHAPTER 5 –
HAZARD MITIGATION STRATEGY

Strategy Development Process

Needles' hazard mitigation strategy is a comprehensive set of actions intended to reduce the impact of hazard events. These hazard mitigation actions will help protect the safety and well-being of residents, visitors, CFs and FOCs, other buildings and structures, key services, the local economy, and other important community assets. Some actions will also help with emergency preparedness, allowing for a more effective community response to hazard events. Preparedness actions are not a required component of an LHMP, but they support and complement mitigation activities. The HMPC chose to include them as part of the overall hazard mitigation strategy.

Use Of Hazard And Threat Assessment

The HMPC relied partly on the hazard profiles and threat assessments in this Plan to develop the mitigation strategy's actions. A comprehensive set of mitigation actions was prepared to respond to the relevant hazard situations and protect residents, businesses, and community assets in Needles. The HMPC ensured that the mitigation actions would help reduce damage from the most frequent types of hazard events, the most significant that may reasonably occur, and those with the greatest potential to harm the community. The HMPC also drafted mitigation actions to help protect the most vulnerable community members and the most vulnerable local assets.

Capabilities Assessment

As part of the effort to draft mitigation actions, the City completed a capabilities assessment, which included reviewing existing policies, personnel, and technical resources to support hazard mitigation activities in Needles. The hazard mitigation actions build off these resources' existing success and leverage their capabilities to support improved resiliency in the community. The capabilities assessment looked at the following types of resources:

- **Personnel resources:** City employees and volunteers, and employees and volunteers at other agencies
- **Plan resources:** Advisory or enforceable plans adopted by the City or other agencies
- **Policy resources:** Policies adopted and implemented by the City or other agencies
- **Technical resources:** Data and tools available to the City
- **Financial resources:** Funding mechanisms available to the City that support mitigation activities

CAPABILITIES IMPROVEMENT/EXPANSION

The ability to expand current mitigation capabilities will generally be reliant upon the budgeting allocated for each department/program for that fiscal year. The level at which these programs may or may not be expanded upon, will be dependent upon the amount of funding received. FEMA has released a series of guides over the past few years which highlight some of the ways in which jurisdictions can expand mitigation. Some strategies for increasing current mitigation capabilities may include:

1) Actively identifying, adopting, and enforcing the most current set of development codes and standards available. Strongly encouraging new development to be constructed to higher standards than currently required, increasing resilience within the community.
2) Engaging parts of the community that may not be actively involved in mitigation efforts.
3) Expanding the number and types of organizations involved in mitigation planning and implementation, increasing both efficiency and bandwidth.
4) Fostering new relationships to bring underrepresented populations and partners to the hazard's mitigation planning process.
5) During the annual LHMP review, the committee should look for opportunities to fund and expand/enhance the effectiveness of current mitigation actions.

Table 5-1 shows the capabilities assessment for Needles.

TABLE 5-1: CITY OF NEEDLES CAPABILITY ASSESSMENT

Resource	Resource Description	Connection to Current Mitigation/Future Opportunities for Expansion and Improvement
Legal and Regulatory Capabilities		
Needles City General Plan – Land Use and Transportation Element (2023)	The Element serves as a guide to the ultimate development pattern for the city, both within its incorporated boundaries and sphere of influence. The Land Use and Transportation Element: • Designates the distribution, location, and balance of land uses. • Describes the desired build-out of Needles • Describes building intensity standards for each land use. • Communicates population density. • Ensures compatibility between land uses. The entire Land Use and Transportation Element can be found at: https://cityofneedles.com/wp-content/uploads/2023/04/Needles_LU_Trans_Element_Adopted_Feb2023.pdf	The Land Use and Transportation Element and HMP will be aligned to describe developmental trends, hazards, and potential development in hazard areas

TABLE 5-1: CITY OF NEEDLES CAPABILITY ASSESSMENT		
Resource	**Resource Description**	**Connection to Current Mitigation/Future Opportunities for Expansion and Improvement**
Needles City General Plan – Housing Element (2022)	The Housing Element contains the following material: • Discusses demographics such as age and race. • Includes a description of the household, including size, income, and home ownership. • Discusses new housing growth needs • Discusses sustainability and energy efficiency • Addresses building code The Housing Element can be found at: https://cityofneedles.com/wp-content/uploads/2022/12/NeedlesHousingElement_Adopted-September-13-2022.pdf	The Community profile and HMP will be aligned to describe the city and its population.
Needles City Municipal Code – Chapter 6 Building Regulations	The purpose of the Building Code is to implement the Needles City General Plan by classifying and regulating the uses of land and structures. It addresses earthquake and fire safety of structures, historic preservation, and compliance with California and Uniform Building Code regulations. The building and construction safety code can be found at: https://needles.municipalcodeonline.com/book?type=ordinances#name=CHAPTER_6_BUILDING_REGULATIONS	Building code policies should inform the HMP and the General Plan Community Development element to provide guidance on developing structures that are compatible with and able to withstand hazards.
Needles City Municipal Code Zoning Code	The purpose of this section of the Municipal Code is to promote public health, safety, and general welfare and preserve and enhance the aesthetic quality of the city by providing regulations to ensure an appropriate mix of land uses in an orderly manner. The zoning code can be found at: https://needles.municipalcodeonline.com/book?type=ordinances#name=ZONING_CODE	Understanding land use policy and regulatory requirements is essential to developing mitigation strategies and activities. The land use components of the City Code will inform the development of the HMP mitigation actions.

TABLE 5-1: CITY OF NEEDLES CAPABILITY ASSESSMENT		
Resource	**Resource Description**	**Connection to Current Mitigation/Future Opportunities for Expansion and Improvement**
Needles City Municipal Code – Chapter 7, Emergency Preparedness	This section of the municipal code provides for the preparation and implementation of plans for the protection of persons and property within the city in the event of an emergency, the direction of the emergency organization, and the coordination of the emergency functions of the city of Needles with all other public agencies, corporations, organizations, and affected private persons. This section of the City Code can be found at: https://needles.municipalcodeonline.com/book?type=ordinances#name=CHAPTER_7_EMERGENCY_PREPAREDNESS	The emergency management organization described in the City Code represents a framework for understanding preparedness activities. It can inform the LHMP of how the City prepares to respond to hazards.
National Flood Insurance Program	NFIP makes federally-backed flood insurance available to homeowners, renters, and business owners in participating communities. The City will continue to participate in the NFIP program and will make changes accordingly.	City websites and social media accounts will include information on the value of flood insurance for properties located in flood hazard areas and how to buy the insurance.
California Standards Building Code (2022)	The California Building Standards Code is a compilation of three types of building standards from three different origins: • Building standards that state agencies have adopted without change from building standards contained in national model codes. • Building standards that have been adopted and adapted from national model codes to address California's ever-changing conditions and • Building standards, authorized by the California legislature, which constitute amendments not covered by national model codes, which have been created and adopted to address California concerns.	Adherence to building codes including local code and regulates growth and controls land use patterns. Addressing known hazards, as codes are updated, results in lowered risk and potentially less losses.

TABLE 5-1: CITY OF NEEDLES CAPABILITY ASSESSMENT		
Resource	**Resource Description**	**Connection to Current Mitigation/Future Opportunities for Expansion and Improvement**
California Emergency Services Act	The California Emergency Services Act is found in Govt C §§8550-8669.7. It covers the entire range of disaster and emergency powers and responsibilities of state and local government dealing with any natural or humanmade disasters or a state of war.	The City shall maintain a current version of the Emergency Services Act to inform the City Council and staff of changes to disaster mitigation and preparedness activities and processes in the State
Needles Public Utility Authority Wildfire Mitigation Plan	The Wildfire Mitigation Plan describes the range of activities that the NPUA is taking to mitigate the threat of power-line ignited wildfires, including its various programs, policies, and procedures. This plan is subject to direct supervision by the Board of Public Utilities and the Needles Public Utility Authority and is implemented by the NPUA's Electric Supervisor. This plan complies with the requirements of Public Utilities Code section 8387 for publicly owned electric utilities to prepare a wildfire mitigation plan by January 1, 2020, and annually thereafter.	Integrate WMP information into the wildfire hazard section of the HMP.
San Bernardino County Hazard Mitigation Plan	Mitigation actions for Needles that require coordination with the county may be integrated into the San Bernardino County Hazard Mitigation Plan. Similar mitigation actions in both the counties and Needles' hazard mitigation plans can lead to a more regionally unified hazard mitigation strategy, improving effectiveness. The SBHMP can be found at the following link: San Bernardino County Hazard Mitigation Plan	San Bernardino County's 2022 Hazard Mitigation Plan identifies and describes the hazard events that may occur in the unincorporated areas of San Bernardino County and provides a suite of mitigation actions to help decrease the potential damage from these hazards.

TABLE 5-1: CITY OF NEEDLES CAPABILITY ASSESSMENT		
Resource	**Resource Description**	**Connection to Current Mitigation/Future Opportunities for Expansion and Improvement**
California State Hazard Mitigation Plan	The California State Hazard Mitigation Plan assesses the types of hazards that may be present in California. It includes descriptions of these hazards, summaries of past hazard events, descriptions of how these hazards may occur in the future, and how these hazards may harm California's people and assets. Like a local hazard mitigation plan, the State Hazard Mitigation Plan is updated every five years. The 2023 State Hazard Mitigation Plan (SHMP) can be found at the following link: https://www.caloes.ca.gov/wp-content/uploads/Hazard-Mitigation/Documents/2023-California-SHMP_Volume-1_11.10.2023.pdf	The City can use the 2023 State Hazard Mitigation Plan as a source of information to refine the hazard profiles and vulnerability assessments in future Needles LHMPs.
Administrative and Technical Capabilities		
Planning Department	The Planning Department is responsible for implementing the City's Zoning Code and related goals, policies, and objectives of the City's General Plan. The Planning Department processes land use and development applications, promoting public health, safety, and general welfare to preserve or enhance the high quality of life.	Provide opportunities for continued education to Community Development staff to maintain state-of-the-art knowledge of new code and regulatory requirements.
Building and Safety Department	Building and Safety's primary responsibility is the enforcement of Building Standards. These standards include the California Building, Electrical, Plumbing, Mechanical, and Energy Codes and Disabled Access Regulations in Title 24 of the California Code of Regulations.	Provide continued education opportunities to Building and Safety staff to maintain state-of-the-art knowledge of new code and regulatory requirements.
Police Department	The City of Needles contracts with San Bernardino County Sheriff's Department for law enforcement services.	Proactively identify opportunities to coordinate and collaborate with neighboring jurisdictions to increase City and region-wide capabilities.

TABLE 5-1: CITY OF NEEDLES CAPABILITY ASSESSMENT		
Resource	**Resource Description**	**Connection to Current Mitigation/Future Opportunities for Expansion and Improvement**
Fire Department	The City of Needles contracts with San Bernardino County Fire. The location of the local San Bernardino County station is 1113 E. Broadway Ave (Hwy 95 South).	Proactively identify opportunities to coordinate and collaborate with neighboring jurisdictions to increase City and region-wide capabilities.
Public Works Department	These services include street maintenance and repair, transportation, and building maintenance. Main areas of responsibility include: • Management of street sweeping. • Traffic signs and signals Painting of street and curb markings • Graffiti removal • Street repairs • Flood Control Maintenance • City Building Maintenance • Road Closures	Improve the understanding of the role that daily activities play in hazard mitigation.
Floodplain Manager	The duties and responsibilities of the Floodplain Administrator shall include, but not be limited to: • Permit review • Flood hazard reduction • NFIP program administration • Construction inspections	The Floodplain Administrator supports compliance with NFIP requirements, advocates for appropriate development in flood hazard areas, and provides technical expertise on effective flood mitigation activities. This can support mitigation activities.
Planning Commission	This eight (8) member Commission, established by state law, has a primary function of studying proposed developments that may impact the community's growth and environment. This commission ensures that proposed developments will meet the City of Needles' technical, environmental, and aesthetic standards. The commission holds public hearings to review plans to ensure they comply with the city's zoning regulations and general plan for development.	Provide opportunities for continued education to members of the Planning Commission to maintain state-of-the-art knowledge of new code and regulatory requirements.

TABLE 5-1: CITY OF NEEDLES CAPABILITY ASSESSMENT		
Resource	**Resource Description**	**Connection to Current Mitigation/Future Opportunities for Expansion and Improvement**
City Attorney	The City Attorney provides legal services to the City Council, City Departments, and City committees. The City Attorney is responsible for preparing and reviewing all City ordinances, resolutions, contracts, agreements, and other legal documents. The City Attorney also represents the City in litigation matters involving the City.	Provide opportunities for the County Attorney to review updates to regulatory information to provide expert review of County resolutions and ordinances that may address hazard mitigation.
City Clerk	The City Clerk serves as a critical link between the City of Needles and its citizens. The City Clerk is the local official who administers democratic processes such as elections, all legislative actions, and ensures transparency to the public. The City Clerk is a compliance officer for federal, state, and local statutes, including the Political Reform Act and the Brown Act.	The City Clerk is integral to the HMP adoption process. They make sure the adoption resolution meets all administrative requirements.
Southern California Association of Governments (SCAG)	Functions as the Metropolitan Planning Organization for six counties: Los Angeles, Orange, San Bernardino, Riverside, Ventura, and Imperial. As the designated Metropolitan Planning Organization, the Association of Governments is mandated by the federal government to research and draw up plans for transportation, growth management, hazardous waste management, and air quality.	Attend SCAG meetings. Continue to participate in SCAG-sponsored programs. Routinely coordinate with SCAG staff to stay informed of current planning initiatives.
California Governor's Office of Emergency Services	The California Governor's Office of Emergency Services (Cal OES) is the state agency responsible for reducing hazards through mitigation activities, conducting emergency planning, supporting emergency response and recovery activities, and liaising between local and federal agencies on emergency-related issues. Cal OES guides hazard mitigation planning activities, shares best practices, and distributes funding opportunities.	The City can work with Cal OES to obtain funding to implement LHMP mitigation strategies and receive future updates.

TABLE 5-1: CITY OF NEEDLES CAPABILITY ASSESSMENT		
Resource	**Resource Description**	**Connection to Current Mitigation/Future Opportunities for Expansion and Improvement**
Federal Emergency Management Agency	The Federal Emergency Management Agency (FEMA) is responsible for hazard mitigation, emergency preparedness, and emergency response and recovery activities. It guides state and local governments on hazard mitigation activities, including best practices and compliance with federal requirements.	FEMA also provides funding for hazard mitigation actions through grant programs.
Cal-Adapt	Cal-Adapt is an online tool that provides detailed projections for future climate-related conditions in California, including factors such as temperature, precipitation, and sea-level rise. These projections can help inform future hazard events and explain how hazard conditions are expected to change.	The City can use Cal-Adapt to monitor anticipated changes in future climate conditions and adjust mitigation actions accordingly.
Online Services (Needles Website)	Over the past several years, the City of Needles has provided 24/7 access to a wide range of online services. The website includes featured City services from Needles. Provides alert and warning information. Provides weather information and other public safety. Contains information on home and individual preparedness. The City Website can be found at the following link: City of Needles	This service allows the public to ask questions and access information to know what's going on within the city and better prepare for a hazard. Link to FEMA, State, and County websites and social media accounts. Provide comprehensive personal/family preparedness information on these media.
California Department of Transportation	The California Department of Transportation (Caltrans) is the state agency with jurisdiction over designated highways, including State Route SR-62, US Route 95, and Interstate I-40.	Mitigation measures related to ensuring the resiliency of state-designated routes will be implemented through coordination with Caltrans.
Financial Resources		
General Fund	Program operations and specific projects. Consists of property tax, sales tax, transient occupancy tax, and franchise tax that can be used for general purposes.	Hazard mitigation projects may be considered during the annual budgeting process for funding from the general fund.

TABLE 5-1: CITY OF NEEDLES CAPABILITY ASSESSMENT		
Resource	**Resource Description**	**Connection to Current Mitigation/Future Opportunities for Expansion and Improvement**
Enterprise Funds	The City operates four Enterprise Funds, which include water, electric, wastewater, and solid waste. These Enterprise funds account for revenue derived from specific taxes or other revenue sources restricted by law or administrative action to be expended for specified purposes.	Where permissible, these funds may be considered during annual budgeting for funding mitigation projects.
Community Development Block Grants (CDBG)	The CDBG program provides funding for eligible senior activities such as in-home care, art classes, counseling, and home-delivered meals. HUD also provides Disaster Recovery Assistance in the form of flexible grants to help cities, counties, and States recover from Presidentially declared disasters, especially in low-income areas, subject to the availability of supplemental appropriations.	Where applicable, CDBG grants should be used to fund mitigation projects that enhance the resiliency of low-income and underserved communities.
Hazard Mitigation Grant Program (HMPG)	Provides support for pre-and post-disaster mitigation plans and projects	Train staff on notice of intent (NOI) procedures and track opportunities on the Cal OES mitigation website to initiate applications for grant funding.
California Proposition One Bond Programs	Authorizes $7.545 billion in general obligation bonds to fund ecosystems and watershed protection and restoration, water supply infrastructure projects, including surface and groundwater storage, and drinking water protection.	Provides monetary opportunities for projects that are outside of traditional mitigation projects.
Building Resilient Infrastructure and Communities (BRIC)	Provides support for pre-disaster mitigation plans and projects.	Train staff on notice of intent (NOI) procedures and track opportunities on the Cal OES mitigation website to initiate applications for grant funding.
Flood Mitigation Assistance Grant Program (FMA)	Mitigates structures and infrastructure that have been repetitively flooded.	Train staff on notice of intent (NOI) procedures and track opportunities on the Cal OES mitigation website to initiate applications for grant funding

TABLE 5-1: CITY OF NEEDLES CAPABILITY ASSESSMENT		
Resource	**Resource Description**	**Connection to Current Mitigation/Future Opportunities for Expansion and Improvement**
Special Use Funds	Program operations and specific projects. It consists of property tax, sales tax, transient occupancy tax, and franchise tax, which can be used for general purposes.	Hazard mitigation projects may be considered during the annual budgeting process for funding from the general fund.
Education and Outreach Capabilities		
FEMA	Provides free preparedness materials from FEMA's online ordering platform. Contains a link to the FEMA readiness app FEMA's website can be found at the following link: FEMA	Provide a link to the site on the County web page and Facebook account.
San Bernardino County Office of Emergency Services Webpage	Responsible for the comprehensive development and implementation of the four phases of emergency management. The San Bernardino County Office of Emergency Services (OES) website can be found at the following link: San Bernardino County OES	Expansion and Improvement: Expand and reorganize the website's disaster preparedness links page.

TABLE 5-1: CITY OF NEEDLES CAPABILITY ASSESSMENT		
Resource	**Resource Description**	**Connection to Current Mitigation/Future Opportunities for Expansion and Improvement**
Code Red Emergency Alert System	The City of Needles has instituted a new rapid emergency notification service called Code RED®. The new system will distribute emergency messages via telephone to targeted areas or the entire city at a rate of 1,000 calls per minute. Code RED® employs a one-of-a-kind Internet mapping capability for geographic targeting of calls, coupled with a high speed telephone calling system capable of delivering customized pre-recorded emergency messages directly to homes and businesses, live individuals and answering machines. This service can be used in case of fires, chemical spills, evacuations, lock downs, downed power lines, lost individuals, natural disasters, abductions, water system problems, bomb threats, or other emergencies. Calls can be geographically targeted for localized messaging. If widespread, the entire community could be called within 20 to 30 minutes. The system also reports who did not get a call so that they may be contacted by other means.	Post material on social media accounts that provide a link to the appropriate website page.
Cal OES Family Readiness Guide	The Guide provides a comprehensive toolkit for making a family emergency plan. The Cal OES Family Readiness Guide can be found at the following link: Cal OES Family Readiness Guide	Provide link to the Readiness Guide on County website and Facebook account.

TABLE 5-1: CITY OF NEEDLES CAPABILITY ASSESSMENT		
Resource	**Resource Description**	**Connection to Current Mitigation/Future Opportunities for Expansion and Improvement**
SBC Ready	The San Bernardino County Ready App helps its users, citizens of the San Bernardino County, CA, to stay prepared and protect their loved ones should an emergency occur. Using the Ready San Bernardino County app, residents will be able to: Share their status with their selected contacts with the push of a button. Receive critical emergency alerts via push notification. Locate San Bernardino County's emergency shelters. View up-to-date evacuation route maps. Get the latest news and weather for the San Bernardino County area. Create a personalized Emergency Preparedness Plan by answering five basic questions. A link to the SBC Ready membership can be found at the following link: https://prepare.sbcounty.gov/	Continue to conduct outreach to expand the database and increase the percentage of residents who are subscribers.
Needles Connect	Needles Connect is a citizen engagement app powered by GOGov. Needles connect allows citizens to: • Stay informed with up-to-date city news, events, and important links • Receive timely updates on service interruptions and community announcements • Streamline communication between city staff and citizens • Enhance community engagement and participation • Empower citizens with instant access to essential city resources	Continue to conduct outreach to expand the database and increase the percentage of residents who are subscribers.

Hazard Mitigation Strategies and Actions

Hazard Mitigation Goals

The goals identified in **Chapter 1** help develop policies to protect community members, ecosystems, and other important assets from hazard events. These goals informed the development of mitigation actions and acted as checkpoints to help City staff determine implementation progress.

Evaluation of Potential Hazard Mitigation Actions

The HMPC prepared a set of potential mitigation actions based on the hazard profiles, threat assessment, capabilities assessment, community survey results, discussions among HMPC members, and existing best practices. Next, the HMPC evaluated these potential actions using the following criteria:

FEMA requires local governments to evaluate potential mitigation actions' monetary and non-monetary costs and benefits. While local governments are not required to assign specific dollar values to each action, they should identify the general size of costs and benefits. The HMPC may elect to include measures with high costs or low benefits, but such measures should benefit the community and make appropriate use of local resources.

Also, FEMA directs local governments to consider the following questions as part of the financial analysis:

1) What is the frequency and severity of the hazard type to be addressed by the action, and how vulnerable is the community to this hazard?
2) What impacts of the hazard will the action reduce or avoid?
3) What benefits will the action provide to the community?

The HMPC also reviewed and revised the potential hazard mitigation actions using the STAPLE/E (Social, Technical, Administrative, Political, Legal, Economic, and Environmental) criteria (**Table 5-2**). The HMPC did not formally assess every potential mitigation action under all STAPLE/E criteria but used the criteria to guide and inform the discussion. The HMPC also discussed how the criteria might evaluate grant applications the City may submit to receive funding for LHMP implementation.

Changes to Previous Mitigation Actions

A review of the mitigation actions from the 2011 Needles LHMP has identified where the City has integrated these strategies into standard procedures and practices. For those actions that were not successfully implemented and remain relevant to the city, this Plan update incorporates these actions into the current mitigation action table, as displayed in **Table 5-3 (highlighted in light green)**. All actions from the 2011 LHMP were carried over to this plan.

TABLE 5-2: STAPLE/E CRITERIA	
Issues	**Criteria**
Social	• Is the action socially acceptable to Needles community members? • Would the action mistreat some individuals? • Is there a reasonable chance of the action causing a social disruption?
Technical	• Is the action likely to reduce the risk of the hazard occurring, or will it reduce the hazard's effects? • Will the action create new hazards or make existing hazards worse? • Is the action the most useful approach for Needles to take, given the City and community members' goals?
Administrative	• Does the City have the administrative capabilities to implement the action? • Are there existing City staff who can lead and coordinate the measure's implementation, or can the City reasonably hire new staff for this role? • Does the City have enough staff, funding, technical support, and other resources to implement the action? • Are there administrative barriers to implementing the action?
Political	• Is the action politically acceptable to City officials and other relevant jurisdictions and political entities? • Do community members support the action?
Legal	• Does the City have the legal authority to implement and enforce the action? • Are there potential legal barriers or consequences that could hinder or prevent the implementation of the action? • Is there a reasonable chance that the implementation of the action would expose the City to legal liabilities? • Could the action reasonably face other legal challenges?
Economic	• What are the monetary costs of the action, and do the costs exceed the monetary benefits? • What are the start-up and maintenance costs of the action, including administrative costs? • Has the funding for action implementation been secured, or is a potential funding source available? • How will funding the action affect the City's financial capabilities? • Could the implementation of the action reasonably burden the Needles economy or tax base? • Could there reasonably be other budgetary and revenue impacts to the City?
Environmental	• What are the potential environmental impacts of the action? • Will the action require environmental regulatory approvals? • Will the action comply with all applicable federal, state, regional, and local environmental regulations? • Will the action reasonably affect any endangered, threatened, or otherwise sensitive species of concern?

2025 Hazard Mitigation Plan

Table 5-3 identifies the 2025 mitigation strategies and actions proposed by the City as part of this LHMP process. In addition to the list of actions, the table also identifies potential funding sources, responsible departments, relative cost estimates, timeframes, and priorities for these

actions, which are described further below. In addition to mitigation action and strategies, several preparedness activities were identified and denoted with the letter "P."

Potential Funding Sources

Table 5-3 identifies the potential funding sources that may be used to implement mitigation strategies. These funding sources include the following federal and state sources:

- **Building Resilient Infrastructure and Communities (BRIC):** A competitive FEMA grant program to support states, local communities, tribes, and territories.
- **Flood Mitigation Assistance Program (FMA):** A competitive grant program that provides funding to states, local communities, federally recognized tribes, and territories. Funds can be used for projects that reduce or eliminate the risk of repetitive flood damage to buildings insured by the National Flood Insurance Program.
- **Hazard Mitigation Grant Program (HMGP):** Provides funding to state, local, tribal, and territorial governments to rebuild in a way that reduces or mitigates future disaster losses in their communities. This grant funding is available after a presidentially declared disaster.
- **Emergency Management Performance Grant Program (EMPG):** The federal government, through the EMPG Program, provides necessary direction, coordination, and guidance and provides necessary assistance, as authorized in this title, to support a comprehensive all-hazards emergency preparedness system.
- **Other Grants:** Other grants may include State of California grants associated with climate change, water infrastructure, homeland security, transportation, or other funding sources that periodically become available. The list below provides some common sources:
    - Climate Adaptation Planning Sustainable Transportation Planning Grant Program - Department of Transportation
    - Sustainable Communities Competitive – Department of Transportation
    - CAL FIRE Wildfire Prevention Grants Program – Department of Forestry and Fire Protection
    - Integrated Climate Adaptation and Resiliency Program's Climate Adaptation Planning Grant – Office of Planning and Research
    - Small Community Drought Relief Program – Department of Water Resources
    - Addressing Climate Impacts – Department of Fish and Wildlife
    - Cleanup Loans and Environmental Assistance to Neighborhoods (CLEAN) Program – Department of Toxic Substances Control
    - Clean Water State Revolving Fund (CWSRF) Program Construction – State Water Resources Control Board

- Drinking Water State Revolving Fund (DWSRF) Construction – State Water Resources Control Board
- Water Recycling Funding Program (WRFP) Construction Grant – State Water Resources Control Board
- Equitable Community Revitalization Grants (ECRG) – Department of Toxic Substances Control
- Water Recycling Funding Program (WRFP) Planning Grant – State Water Resources Control Board
- Infrastructure State Revolving Fund (ISRF) Program - Infrastructure and Economic Development Bank

Responsible Department

Table 5-3 includes the identification of key responsible departments that will be focused on future implementation of mitigation strategies and actions identified by the City.

Relative Cost Estimates

The HMPC identified relative cost estimates to meet the hazard mitigation planning process's cost estimation requirements based on their understanding of the mitigation action intent and their experience developing identical or similar programs/implementing projects. Four cost categories based on the City's typical cost criteria were used for budgeting purposes:

- **Low cost ($):** $15,000 or less
- **Medium cost ($$):** $15,001 to $500,000
- **High cost ($$$):** $500,001 to $2,999,999
- **Very High cost ($$$$):** Greater than $3,000,000

Timeframes

Table 5-3 includes timeframes that provide general timing durations due to the nature of the mitigation actions identified by the City. The following timeframes are used based on the following conditions:

1) **Ongoing (Annually):** Actions that identify this timeframe are the types of actions that City staff would conduct annually.
2) **Ongoing (As Needed):** Actions that identify this timeframe include activities that City staff would conduct in response to a request by internal (City Departments) or external (Property Owners) forces.
3) **Future Planning Process:** Actions identified within this timeframe are considered low-priority actions that the City would like to continue to track but does not feel they would be able to implement in the current planning implementation timeframe.

For actions that use these terms, it is intended to identify that the action may add to existing capabilities and not have a particular start or end date or occur periodically. This is typically used for actions that include new policies, tasks, or standard operating procedures intended to mitigate future risks. If a single year is stated in the timeframe column, this indicates the year the action will begin.

PRIORITIZATION

As part of the mitigation actions development and review, the HMPC also prioritized the actions. The prioritization efforts looked at the risks and threats of each hazard, financial costs and benefits, technical feasibility, and community values. HMPC members were asked to identify their priority actions through a voting exercise. Items are prioritized based on the number of votes the HMPC members receive. These quantitative scores were then converted to low, medium, and high priority qualitative categories.

Based on the criteria and evaluation processes used during Plan development, the HMPC prepared a prioritized list of mitigation actions (**Table 5-3**) to improve Needles' resilience to hazard events.

TABLE 5-3: MITIGATION ACTIONS IMPLEMENTATION PLAN						
Action #	**Mitigation Action Item**	**Potential Funding Source**	**Responsible Department**	**Relative Cost**	**Time Frame**	**Priority**
Emergency Preparedness Activities						
P1	Conduct regular emergency preparedness drills and training exercises for City staff.	General Fund, EMPG	Emergency Office Services		Ongoing (Annually)	Low
P2	Create a Needles Community Emergency Response Team (CERT) program.	General Fund, EMPG	Emergency Office Services		Ongoing (Annually)	Low
P3	Ensure that community evacuation plans include provisions for community members who do not have access to private vehicles or are otherwise unable to drive.	General Fund, EMPG	Emergency Office Services		Ongoing (As Needed)	Low
P4	Continue to ensure effective emergency notifications through multiple media formats, in languages appropriate for the community, about pending, imminent, or ongoing emergency events. Ensure that information is accessible to persons with access and functional needs.	General Fund, EMPG	Emergency Office Services		Ongoing (As Needed)	High
P5	Maintain at least one emergency power-generating station in all critical facilities that the City could use as an emergency public assembly area, such as the Civic Center, Community Centers, and any other locations designated in the future.	General Fund, EMPG	Emergency Office Services		Ongoing (As Needed)	High
P6	Update the Needles Emergency Operations Plan to identify backup power and communications locations for critical facilities.	General Fund, EMPG	Emergency Office Services		Ongoing (As Needed)	Medium
P7	Increase the number of City staff with CalOES Safety Assessment Program (SAP) credentials.	General Fund, EMPG	Emergency Office Services		Ongoing (As Needed)	Low

TABLE 5-3: MITIGATION ACTIONS IMPLEMENTATION PLAN						
Action #	**Mitigation Action Item**	**Potential Funding Source**	**Responsible Department**	**Relative Cost**	**Time Frame**	**Priority**
P8	Establish or update agreements with local schools to ensure facilities can act as evacuation sites during major emergencies.	General Fund, EMPG	Emergency Office Services		Ongoing (As Needed)	Low
P9	Ensure City staff complete all required SEMS/NIMS courses to ensure agency compliance.	General Fund, EMPG	Emergency Office Services		Ongoing (As Needed)	Low
Multiple Hazards						
1.01	Install energy-efficient equipment upgrades in City facilities to increase the longevity of the fuel supply for backup generators. **(Hazards Addressed: All)**	General Fund, BRIC/ HMGP Grants, Other Grants	Utilities	$$	2028	Medium
1.02	Install digital signage in key locations to aid in public outreach and information dissemination during emergency events. **(Hazards Addressed: All)**	General Fund, BRIC/ HMGP Grants, Other Grants	Public Works	$$	2027	Low
1.03	Conduct routine updates to Facility Conditions Assessments for City-owned infrastructure and other utilities and coordinate with other agencies to ensure inspections of other important infrastructure. **(Hazards addressed: All)**	General Fund, BRIC/ HMGP Grants, Other Grants	Public Works/ Utilities	$$	Ongoing (Annually)	Low
1.04	Installation of solar and battery backup systems at key critical facilities within the City. **(Hazards addressed: All)**	General Fund, BRIC/ HMGP Grants, Other Grants	Utilities	$$$$	2026	High
1.05	Work closely with community groups to increase awareness of hazard events and resiliency opportunities among socially vulnerable community members. **(Hazards addressed: All)**	General Fund, BRIC/ HMGP Grants, Other Grants	Housing/ Community Services/ Public Safety	$	Ongoing (Annually)	Low

TABLE 5-3: MITIGATION ACTIONS IMPLEMENTATION PLAN						
Action #	**Mitigation Action Item**	**Potential Funding Source**	**Responsible Department**	**Relative Cost**	**Time Frame**	**Priority**
1.06	Closely monitor changes in the boundaries of mapped hazard areas resulting from land use changes or climate change and adopt new mitigation actions or revise existing ones to ensure continued resiliency. **(Hazards addressed: All)**	General Fund, BRIC/ HMGP Grants, Other Grants	Development Services	$	Ongoing (Annually)	Low
1.07	Integrate policy direction and other information from this Plan into other City documents, including the General Plan, Emergency Operations Plan, and Capital Improvements Program. **(Hazards addressed: All)**	General Fund, BRIC/ HMGP Grants, Other Grants	Development Services/ Public Works/ Utilities	$	Following All Plan Updates	Low
1.08	Monitor funding sources for hazard mitigation activities. **(Hazards addressed: All)**	General Fund, BRIC/ HMGP Grants, Other Grants	All Departments	$	Ongoing (Annually)	Low
1.09	Integrate climate change mitigation and adaptation information and analysis into future LHMP updates and other City Plans, where practicable. **(Hazards addressed: All)**	General Fund, BRIC/ HMGP Grants, Other Grants	All Departments	$	Following Any Plan Update	Low
1.10	Install and harden encased emergency backup power generators at critical facilities and key infrastructure as deemed necessary. Prioritize installations for facilities that serve as key cooling/warming centers (including the Senior Center), and evacuation centers. **(Hazards addressed: All)**	General Fund, BRIC/ HMGP Grants, Other Grants	Utilities	$$$	2027	Low
1.11	Install battery backup power supplies for traffic signals to ensure functionality in the event of power failure. **(Hazards addressed: All)**	General Fund, BRIC/ HMGP Grants, Other Grants	Public Works	$$	2025	Low

TABLE 5-3: MITIGATION ACTIONS IMPLEMENTATION PLAN						
Action #	**Mitigation Action Item**	**Potential Funding Source**	**Responsible Department**	**Relative Cost**	**Time Frame**	**Priority**
Earthquake Hazards (Seismic Shaking)						
2.01	Update the City's Emergency Operations Plan annually to include recent additions/changes to the City's Earthquake preparedness/response plans and protocols.	General Fund, BRIC/ HMGP Grants, California Earthquake Authority Grants, Other Grants	Emergency Office Services	$$	Ongoing (Annually)	Low
2.02	Develop a small project-based retrofit program to assist homeowners with simple earthquake mitigation activities (i.e., water heater straps, furniture anchoring, gas shut-off tools, and other emergency supplies) to reduce strain on City resources during an event.	General Fund, BRIC/ HMGP Grants, California Earthquake Authority Grants, Other Grants	Development Services	$$	2027	Medium
2.03	Conduct an educational campaign to incentivize and promote medium-scale seismic retrofits, such as window films to minimize shattering, rooftop-mounted equipment anchors, masonry chimney bracing, and other preventative measures to reduce damage to private buildings.	General Fund, BRIC/ HMGP Grants, California Earthquake Authority Grants, Other Grants	Development Services	$$	Ongoing (Annually)	Low
2.04	Conduct a seismic analysis of all City-owned key facilities and retrofit vulnerable facilities.	General Fund, BRIC/ HMGP Grants, California Earthquake Authority Grants, Other Grants	Public Works	$$$	2027	Low

TABLE 5-3: MITIGATION ACTIONS IMPLEMENTATION PLAN						
Action #	**Mitigation Action Item**	**Potential Funding Source**	**Responsible Department**	**Relative Cost**	**Time Frame**	**Priority**
2.05	To the extent feasible, construct all new City-owned facilities to remain operational in the event of a major earthquake.	General Fund, BRIC/ HMGP Grants, California Earthquake Authority Grants, Other Grants	All Departments	$$$$	2028	Low
2.06	Retrofit key critical facilities with seismically rated window film treatments that ensure glass windows do not shatter during a strong seismic event.	General Fund, BRIC/ HMGP Grants, California Earthquake Authority Grants, Other Grants	Public Works	$$$	2028	Low
2.07	Analyze the City's building and housing stock to create an inventory of seismically vulnerable buildings (unreinforced masonry, soft-story construction, non-ductile concrete buildings) within the city and conduct an educational program providing information on how to begin the process of seismically retrofitting these buildings.	General Fund, BRIC/ HMGP Grants, California Earthquake Authority Grants, Other Grants	Development Services	$$	2027	Low
Wildfires						
3.01	Promote the proper maintenance and separation of power lines and efficient response to fallen power lines, particularly in areas that experience strong winds.	General Fund, BRIC/ HMGP Grants, California Climate Resilience Grants, Cal Fire Grants, Other Grants	Utilities	$$$	Ongoing (Annually)	Low

TABLE 5-3: MITIGATION ACTIONS IMPLEMENTATION PLAN						
Action #	**Mitigation Action Item**	**Potential Funding Source**	**Responsible Department**	**Relative Cost**	**Time Frame**	**Priority**
3.02	Identify funding for existing non-conforming retrofits in fire-prone areas to use non-combustible building materials such as masonry, brick, stucco, concrete, steel, or others as appropriate. Establish defensible space zones around homes in these areas to reduce fire vulnerability.	General Fund, BRIC/ HMGP Grants, California Climate Resilience Grants, Cal Fire Grants, Other Grants	Development Services / Public Safety	$$$	Ongoing (Annually)	Medium
3.03	Explore new funding opportunities to increase the budget for public outreach and fire hazard prevention awareness and education.	General Fund, BRIC/ HMGP Grants, California Climate Resilience Grants, Cal Fire Grants, Other Grants	Public Safety	$	Ongoing (Annually)	Low
3.04	Create a rapid response plan from among first responder agencies to secure hospital, nursing, and assisted living facilities during high fire conditions and incidents.	General Fund, BRIC/ HMGP Grants, California Climate Resilience Grants, Cal Fire Grants, Other Grants	Public Safety	$$	2027	Medium

TABLE 5-3: MITIGATION ACTIONS IMPLEMENTATION PLAN						
Action #	**Mitigation Action Item**	**Potential Funding Source**	**Responsible Department**	**Relative Cost**	**Time Frame**	**Priority**
3.05	Coordinate with SBCF and surrounding jurisdictions on home hardening and vegetation management assessments to assist residents in understanding and addressing wildfire risk.	General Fund, BRIC/ HMGP Grants, California Climate Resilience Grants, Cal Fire Grants, Other Grants	Code Enforcement (Development Services)	$	Ongoing (Annually)	Low
3.06	Conduct regular fuel modification projects and clear vegetation to reduce fire hazard risks, such as removal of dead vegetation and invasive plants in parks, open spaces, and right-of-way embankments and creating larger buffers within the wildland-urban interface.	General Fund, BRIC/ HMGP Grants, California Climate Resilience Grants, Cal Fire Grants, Other Grants	Public Works/ Development Services	$$	Ongoing (Annually)	High
Severe Weather (Drought, Extreme Heat, Severe Wind, Thunderstorms)						
4.01	Expand current outreach to residents and businesses prior to the severe winds on proper tree maintenance and identification of potentially hazardous trees. **(Hazards addressed: Severe Wind)**	General Fund, BRIC/ HMGP Grants, California Climate Resilience Grants, Other Grants	Public Works/ Code Enforcement	$	Ongoing (Annually)	Low

TABLE 5-3: MITIGATION ACTIONS IMPLEMENTATION PLAN						
Action #	**Mitigation Action Item**	**Potential Funding Source**	**Responsible Department**	**Relative Cost**	**Time Frame**	**Priority**
4.02	Remove or trim trees determined to be susceptible to blowing over during a severe wind event. Encourage the undergrounding of existing utilities, where practicable. **(Hazards Addressed: Severe Wind)**	General Fund, BRIC/ HMGP Grants, California Climate Resilience Grants, Other Grants	Public Works/ Code Enforcement/ Utilities	$$	Ongoing (Annually)	Low
4.03	Update the Needles Municipal Code to reflect the latest advances in best practices in landscape design that reduce water use within the City and support fire risk reduction. **(Hazards addressed: Drought)**	General Fund, BRIC/ HMGP Grants, California Climate Resilience Grants, Other Grants	Development Services	$	2025	Medium
4.04	Update the City's Emergency Operations Plan annually to include recent additions/changes to the City's drought preparedness/response plans and protocols. **(Hazards addressed: Drought)**	General Fund, BRIC/ HMGP Grants, California Climate Resilience Grants, Other Grants	Emergency Office Services	$$	Ongoing (Annually)	Low
4.05	Develop a campaign to encourage water/energy efficiency, reduce consumption for existing development, and promote the expansion of electric vehicle-ready construction in new development. **(Hazards addressed: Drought, Extreme Heat)**	General Fund, BRIC/ HMGP Grants, California Climate Resilience Grants, Other Grants	Utilities/ Development Services	$$$	2025	High

TABLE 5-3: MITIGATION ACTIONS IMPLEMENTATION PLAN						
Action #	**Mitigation Action Item**	**Potential Funding Source**	**Responsible Department**	**Relative Cost**	**Time Frame**	**Priority**
4.06	Create a Cooling Center Plan for the use of designated public facilities (libraries, community centers, etc.) as cooling centers for vulnerable populations during extreme weather events. **(Hazards addressed: Extreme Heat)**	General Fund, BRIC/ HMGP Grants, California Climate Resilience Grants, Other Grants	Emergency Office Services	$$	2025	High
4.07	During the design review process, promote passive cooling design (brise-soleil, long roof overhangs, locating windows away from southern facades, etc.) in new developments. **(Hazards addressed: Extreme Heat)**	General Fund, BRIC/ HMGP Grants, California Climate Resilience Grants, Other Grants	Development Services	$	Ongoing (As needed)	Low
4.08	Evaluate the long-term capacity of designated cooling centers and shelters in the City to provide sufficient relief from extreme heat. Assess the need to expand services as the frequency, length, and severity of future heat waves potentially change due to climate change. **(Hazards addressed: Extreme Heat)**	General Fund, BRIC/ HMGP Grants, California Climate Resilience Grants, Other Grants	Emergency Office Services/ Community Services	$$	2025	Low
4.09	Upgrade HVAC within City facilities to more efficient systems, including split or decentralized systems that allow for heating and cooling rooms/spaces. **(Hazards addressed: Extreme heat)**	General Fund, BRIC/ HMGP Grants, California Climate Resilience Grants, Other Grants	All Departments	$$$	2026	High

TABLE 5-3: MITIGATION ACTIONS IMPLEMENTATION PLAN						
Action #	**Mitigation Action Item**	**Potential Funding Source**	**Responsible Department**	**Relative Cost**	**Time Frame**	**Priority**
4.10	Increase the use and construction of shade structures within new developments, City facilities, parks, and trails to reduce extreme heat conditions. **(Hazards addressed: Extreme Heat)**	General Fund, BRIC/ HMGP Grants, California Climate Resilience Grants, Other Grants	Development Services/ Public Works	$$$	Ongoing (As Needed)	Medium
4.11	Promote early notifications to residents before a severe weather event, focusing on effective communication methods with vulnerable populations to better ensure they have adequate time to prepare. **(Hazards addressed: Severe Wind, Extreme Heat, Thunderstorms)**	General Fund, BRIC/ HMGP Grants, California Climate Resilience Grants, Other Grants	Emergency Office Services	$	Ongoing (As Needed)	Low
4.12	Update the City's Emergency Operations Plan annually to include recent additions/changes to the City's Extreme Heat preparedness/response plans and protocols. **(Hazards addressed: Extreme Heat)**	General Fund, BRIC/ HMGP Grants, California Climate Resilience Grants, Other Grants	Emergency Office Services	$$	Ongoing (Annually)	Low
4.13	Ensure effective emergency notifications through multiple media formats, in languages appropriate for the community, about pending, imminent, or ongoing thunderstorm events (to include flash flood watches/warnings and severe wind warnings). Ensure that information is accessible to persons with access and functional needs. **(Hazards Addressed: Thunderstorms)**	General Fund, BRIC/ HMGP Grants, California Climate Resilience Grants, Other Grants	Emergency Office Services	$	Ongoing (As Needed)	Low

TABLE 5-3: MITIGATION ACTIONS IMPLEMENTATION PLAN						
Action #	**Mitigation Action Item**	**Potential Funding Source**	**Responsible Department**	**Relative Cost**	**Time Frame**	**Priority**
Infrastructure Failure (Energy Shortage, Power Outage)						
5.01	Establish and routinely update a confidential inventory of critical infrastructure and ensure utility providers coordinate development activities with future resilience enhancements.	General Fund, BRIC/ HMGP Grants, Other Grants	Utilities	$$	2025	Medium
5.02	Expand access to alternative energy technologies, energy efficiency improvements and appliances, and programs for vulnerable populations to reduce energy consumption and the need for City services during extreme heat events.	General Fund, BRIC/ HMGP Grants, Other Grants	Utilities	$$	2026	Medium
5.03	Develop a Power Failure Strategic Plan that prioritizes the following: - Identification of critical facilities requiring backup power supplies. - Identification of critical systems requiring backup battery supplies to ensure effective operations during power failure events. - Development of criteria for backup power supplies and equipment for City-owned buildings and infrastructure - Development of code updates/modifications for new developments/redevelopments that are energy resilient or include backup power supplies or plug-in-ready retrofits. - Compilation of funding sources and strategies for City facility improvements and resources for residents and businesses.	General Fund, BRIC/ HMGP Grants, Other Grants	Utilities/ Development Services	$$	2025	High
5.04	Install resilient emergency power supplies and microgrids at key critical facility locations throughout the City.	General Fund, BRIC/ HMGP Grants, Other Grants	Utilities	$$	2027	Medium

TABLE 5-3: MITIGATION ACTIONS IMPLEMENTATION PLAN						
Action #	**Mitigation Action Item**	**Potential Funding Source**	**Responsible Department**	**Relative Cost**	**Time Frame**	**Priority**
Geologic Hazards (Expansive Soils)						
6.01	Monitor changes to areas where expansive soils are located.	General Fund	Development Services	$$	Ongoing (As Needed)	Low
6.02	Conduct an analysis and develop maps of expansive soil locations throughout the city.	General Fund, BRIC/HMGP Grants, Other Grants	Development Services	$$	2026	Low
Flood (Flooding and Dam Failure)						
7.01	Update the City's Master Plan of Drainage regularly to incorporate new data and/or address emerging issues.	General Fund, BRIC/ HMGP Grants, Flood Mitigation Assistance Grants, Other Grants	Development Services	$$	Ongoing (Annually)	Low
7.02	Investigate the use of permeable paving and landscaped swales for new construction and replacement of City-owned hardscaped areas.	General Fund, BRIC/ HMGP Grants, Flood Mitigation Assistance Grants, Other Grants	Development Services	$$	2028	Low

TABLE 5-3: MITIGATION ACTIONS IMPLEMENTATION PLAN						
Action #	**Mitigation Action Item**	**Potential Funding Source**	**Responsible Department**	**Relative Cost**	**Time Frame**	**Priority**
7.03	Identify potential flood improvements that reduce inundation from both storm flows and potential dam inundation effects.	General Fund, BRIC/ HMGP Grants, Flood Mitigation Assistance Grants, Other Grants	Development Services	$$	2028	High
7.04	Conduct frequent cleanings of storm drain intakes, especially before and during the rainy season.	General Fund, BRIC/ HMGP Grants, Flood Mitigation Assistance Grants, Other Grants	Development Services	$$	Ongoing (Annually)	Low
7.05	Track areas where ponding frequently occurs during heavy rainfall and install new drains or upgrade existing ones to reduce ponding.	General Fund, BRIC/ HMGP Grants, Flood Mitigation Assistance Grants, Other Grants	Development Services	$$	2028	Low
7.06	Identify all structures located in FEMA flood zones and determine the need to map, analyze, and modify FEMA flood maps. If flood map revisions are possible, work with property owners to determine the desire to perform this activity on their behalf.	General Fund, BRIC/ HMGP Grants, Flood Mitigation Assistance Grants, Other Grants	Development Services	$$	2027	Medium

TABLE 5-3: MITIGATION ACTIONS IMPLEMENTATION PLAN						
Action #	**Mitigation Action Item**	**Potential Funding Source**	**Responsible Department**	**Relative Cost**	**Time Frame**	**Priority**
7.07	Update the City's Emergency Operations Plan annually to include recent additions/changes to the City's Flash Flooding preparedness/response plans.	General Fund, BRIC/ HMGP Grants, Flood Mitigation Assistance Grants, Other Grants	Emergency Office Services	$$	Ongoing (Annually)	Low
7.08	Identify specific public works projects/improvements to address flash flooding impacts throughout the flood prone portions of the city.	General Fund, BRIC/ HMGP Grants, Flood Mitigation Assistance Grants, Other Grants	Public Works	$$	2025	Low
7.09	Identify specific improvements that may be implemented to reduce flood hazards to the Historic Harvey House railway station.	General Fund, BRIC/ HMGP Grants, Flood Mitigation Assistance Grants, Other Grants	Public Works	$$	2025	Low
7.10	Continue to enforce development regulations based on the most current FEMA flood insurance rate maps and continue to comply with the NFIP.	General Fund, BRIC/ HMGP Grants, Flood Mitigation Assistance Grants, Other Grants	Development Services	$	Ongoing (As Needed)	Low

TABLE 5-3: MITIGATION ACTIONS IMPLEMENTATION PLAN						
Action #	**Mitigation Action Item**	**Potential Funding Source**	**Responsible Department**	**Relative Cost**	**Time Frame**	**Priority**
7.11	Coordinate with dam owners/operators and state and federal agencies to collectively identify threats to the City and the region and identify ways to retrofit/strengthen the dams under their control.	General Fund, BRIC/ HMGP Grants, Flood Mitigation Assistance Grants, Other Grants	Emergency Office Services	$	2028	Low
7.12	Conduct a public outreach and awareness campaign about the hazards associated with dam failure, the areas within the city susceptible to impact, and evacuation procedures and facilities available in the event an impact occurs.	General Fund, BRIC/ HMGP Grants, Flood Mitigation Assistance Grants, Other Grants	Emergency Office Services	$$	Ongoing (Annually)	Low
7.13	Update the City's Emergency Operations Plan annually to include recent additions/changes to the City's Dam Failure preparedness/response plans.	General Fund, BRIC/ HMGP Grants, Flood Mitigation Assistance Grants, Other Grants	Emergency Office Services	$$	Ongoing (Annually)	Low
Human-Caused Hazards (Cyber Threat, Hazardous Materials Incident, Natural Gas Pipeline Hazards, Transportation Accident)						
8.1	Disseminate information on cyber threats to City staff and continually follow up with information on further developments of the situation. **(Hazards addressed: Cyber Threats)**	General Fund, BRIC/ HMGP Grants, Other Grants	IT Department	$	Ongoing (As Needed)	Low
8.2	Regularly update cyber security software and educate business owners and residents on current internet-based threats. **(Hazards addressed: Cyber Threats)**	General Fund, BRIC/ HMGP Grants, Other Grants	IT Department	$$	On going (As-Needed)	Medium

TABLE 5-3: MITIGATION ACTIONS IMPLEMENTATION PLAN						
Action #	**Mitigation Action Item**	**Potential Funding Source**	**Responsible Department**	**Relative Cost**	**Time Frame**	**Priority**
8.3	Ongoing training in coordination with County Fire, the Railroad, County Sheriff, Mutual Aid, Police, Fire, BLM, and Pipeline Companies (petroleum gas, electric, fiber optic) to be prepared for and respond to potential hazardous material spills/incidents along the railroad, I-40, or I-95. **(Hazard Addressed: Hazardous Materials Incident, Natural Gas Pipeline Hazards)**	General Fund, BRIC/HMGP Grants, Other Grants	Emergency Office Services	$$	Ongoing (Annually)	Low
8.4	Discourage new sensitive land uses, including schools, parks, childcare centers, adult and senior assisted living facilities, and community centers, from locating near identified hazardous material facilities. Discourage or prohibit new hazardous material facilities from locating near sensitive land uses. **(Hazard Addressed: Hazardous Materials Incident)**	General Fund, BRIC/ HMGP Grants, Other Grants	Development Services	$	Ongoing (Annually)	Low
8.5	Continuously inspect businesses and other properties storing hazardous materials and create an inventory of storage locations that require updates, maintenance, or renovation. **(Hazard Addressed: Hazardous Materials Incident)**	General Fund, BRIC/ HMGP Grants, Other Grants	SB County Fire	$$	Ongoing (Annually)	Low
8.6	Develop a parcel-level database, in coordination with San Bernardino County, which tracks the status of hazardous materials storage and use, prioritized by potential threat to surrounding properties. **(Hazard Addressed: Hazardous Materials Incident)**	General Fund, BRIC/ HMGP Grants, Other Grants	Public Works	$$	2027	Low

TABLE 5-3: MITIGATION ACTIONS IMPLEMENTATION PLAN						
Action #	**Mitigation Action Item**	**Potential Funding Source**	**Responsible Department**	**Relative Cost**	**Time Frame**	**Priority**
8.7	Continue to work with solid waste service businesses to educate residents and businesses on safely disposing of small quantities of hazardous materials. **(Hazards Addressed: Hazardous Materials Incident)**	General Fund, BRIC/HMGP Grants, Other Grants	Public Works	$	Ongoing (Annually)	Low
8.8	Coordinate with hazardous materials generators/operators (Southwest Gas, etc.) regularly to understand changes to operations within the city. **(Hazards Addressed: Hazardous Materials Incident)**	General Fund, BRIC/HMGP Grants, Other Grants	Emergency Office Services	$	Ongoing (Annually)	Low
8.9	Analyze the locations of railroad rights of way, and adjacent land uses to determine key locations of concern if a train derailment occurs. **(Hazards Addressed: Hazardous Materials Incident, Transportation Accident)**	General Fund, BRIC/HMGP Grants, Other Grants	Development Services	$	2025	Low
8.10	Maintain relationships with BNSF to improve rail safety. **(Hazards Addressed: Transportation Accident)**	General Fund, BRIC/HMGP Grants, Other Grants	Development Services/ Emergency Office Services	$$	Ongoing (Annually)	Low

*** Relative Cost Categories**
$ - Less than $15,000
$$ - $15,001 to $500,000
$$$ - $500,001 to $2,999,999
$$$$ - Greater than $3,000,000

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National Flood Insurance Program

Needles participates in the National Flood Insurance Program (NFIP), created by Congress in 1968 to provide subsidized flood insurance to homeowners living in flood-prone areas. Needles has participated in NFIP since July 1979. **Table 5-4** provides the City's NFIP information.

TABLE 5-4: FLOOD INSURANCE PROGRAM PARTICIPANT DATA	
Initial Flood Hazard Boundary Map (FHBM)	**6/14/1974**
Initial Flood Insurance Rate Map (FIRM)	**7/16/1979**
NFIP Participation Date	**7/16/1979**
Current Effective Map Date	**9/2/2016**

Although participation is not a dedicated hazard mitigation action, Needles will continue participating in the NFIP and comply with the program's requirements by enforcing the City's Floodplain Management Regulations. This regulation applies to all areas identified as flood-prone within the city. This chapter of the Municipal Code identifies the purpose of the regulation, methods of reducing flood losses, basis for establishing flood hazard areas, development permit requirements, duties and responsibilities of the City's Floodplain Manager, development standards that apply in flood-prone areas, and required documentation and analysis for construction within these areas. As part of the City's efforts to comply with NFIP, Needles will make updates and revisions to the Floodplain Management regulations to minimize the threat of harm from flood events. These updates and revisions may be promoted by changes in local demographics, land use shifts, flood regime changes such as the frequency and intensity of flood events, and other factors warranting municipal action. The City will also continue incorporating any changes to mapped flood plains' locations and designations into future planning documents, including future updates to this Plan. **Table 5-5** provides the City's floodplain management regulations.

TABLE 5-5: CITY OF NEEDLES FLOODPLAIN MANAGEMENT REGULATIONS	
Adoption of Minimum Floodplain Management Criteria and Implementation and Enforcement of Floodplain Management Regulations	Ord. No. 431-AC, § 1.1; Ord. No. 457-AC, § 2 (part). Chapter 9A Floodplain Management
Designee to Implement NFIP	Ord. No. 431-AC, § 4.2; Ord. No. 457-AC, § 2 (part). 9A-14: Designation of the Floodplain Administrator. The City Engineer fulfills this role.
Implementation of Substantial Improvement/ Substantial Damages Provisions	Article 9A-V: Provisions for Flood Hazard Reduction. 9A-17: Standards of Construction
* Ordinances are hyperlinked to Municipal Code Section	

The City of Needles contains Special Flood Hazard Areas (SFHA). Under the NFIP, there are 13 policies in force, amounting to roughly $12,624 in premiums paid annually. Total insurance coverage for these policies amounts to $3,332,000. Needles has no repetitive loss or severe repetitive loss properties that FEMA identified; however, they have had 5 closed Paid Loss cases totaling $16,398 in damages paid out.

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CHAPTER 6 –
PLAN MAINTENANCE

For this LHMP to remain effective and useful to the community of Needles, it must remain up to date. An updated version of the LHMP will continue to guide Needles' hazard mitigation activities and help keep the City eligible for state and federal hazard mitigation funding. The HMPC has structured this LHMP so individual sections can easily be updated as new information becomes available and new needs arise, helping to keep this Plan current.

This chapter discusses updating this Plan to comply with applicable state and federal requirements. This chapter also describes how the City can incorporate the mitigation actions described in **Chapter 5** into existing programs and planning mechanisms and how public participation will remain an important part of Plan monitoring and future update activities.

Coordinating Body

The HMPC will remain responsible for maintaining and updating the Plan, including evaluating the Plan's effectiveness as needed. Members of the HMPC will also coordinate the Plan's implementation through their respective positions. **Table 1-2** contains a list of current members. In future years, staff and representatives (either current HMPC members or other individuals) from the following departments, districts, and agencies should be included in maintenance and update activities:

- Building and Safety
- City Attorney
- City Clerk
- City Manager
- Community Services Department
- Engineering Department
- Finance
- Fire Department
- Human Resources
- Planning Department
- Public Works
- Sheriff's Department

The staff member currently serving as the HMPC leader (responsible for coordinating future updates) is in the Development Services Department. During the update process, they will serve as the project manager or designate this role to another staff member. The HMPC leader or their designee will coordinate the maintenance of this Plan, lead the formal Plan review and evaluation activities, direct the Plan update, and assign tasks to other members of the HMPC to complete these activities. Such tasks may include collecting data, developing new mitigation actions, updating mitigation actions, presenting to City staff and community groups, and revising the Plan sections.

Plan Implementation

The Plan's effectiveness depends on the successful implementation of the mitigation actions. Implementation includes integrating mitigation actions into existing City plans, policies, programs, and other implementation mechanisms. The mitigation actions in this Plan are intended to reduce the damage from hazard events, help the City secure funding, and provide a framework for hazard mitigation activities. HMPC members prioritized the hazard mitigation actions in **Table 5-3** in **Chapter 5**. These priorities will guide implementing these actions through new or existing City mechanisms as resources are available. The LHMP project manager is responsible for overseeing the implementation, promotion, and maintenance of this Plan and facilitating meetings and coordinating activities related to Plan implementation and maintenance.

The key City Plans that will incorporate content from this LHMP include:

1) **Needles General Plan Safety Element** – This element will incorporate relevant mapping and analysis in the Safety Element to ensure this plan's goals and policies are reinforced throughout future developments and projects proposed within the city.

2) **Needles Emergency Operations Plan** – The EOP focuses on the effective preparedness and response to hazard events within the city. Incorporating relevant content from this plan into the EOP ensures consistency regarding the hazards addressed in both plans.

3) **Needles Capital Improvements Program** – The CIP identifies key infrastructure investments throughout the city, including hazard mitigation elements. Incorporating this plan into the CIP may enhance infrastructure investment through additional funding and/or modification of improvements to include hazard mitigation elements.

This integration of the LHMP into the Needles General Plan also allows the City to comply with AB 2140 requirements, as identified in **Chapter 1** of this plan.

Plan Maintenance Process

The City's plan maintenance process will rely on the Needles Mitigation Implementation Handbook, located in **Appendix E**. The handbook is intended to function as a stand-alone document that gives concise and accessible guidance to staff to implement and maintain the Plan. A key component is the specific mechanisms that the City can use to integrate this plan into the other City planning mechanisms.

Plan Monitoring And Evaluation

When members of the HMPC are not updating the Plan, they will meet at least once a year to go over mitigation action implementation and evaluate the Plan's effectiveness. These meetings will include:

1) Discussion of the timing of mitigation action implementation

2) Mitigation action implementation evaluation and determination of success

3) Mitigation action prioritization revisions, if deemed necessary

4) Mitigation action integration into other mechanisms, as needed

The first of these meetings will be held in the 2025-2026 fiscal calendar year. To the extent possible, HMPC meetings will be scheduled at an appropriate time in the City's annual budgeting process, which will help ensure that funding and staffing needs for mitigation actions are considered.

When the HMPC meets to evaluate the Plan, members will consider these questions:

- What hazard events, if any, have occurred in Needles in the past year? What were the impacts of these events on the community? Were the impacts mitigated, and if so, how?
- What mitigation actions have been successfully implemented? Have any mitigation actions been implemented but not successfully, and if so, why?
- What mitigation actions, if any, have been scheduled for implementation but have not yet been implemented?
- What is the schedule for implementing future mitigation actions? Is this schedule reasonable? Does the schedule need to be adjusted for future implementation, and are such adjustments appropriate and feasible?
- Have any new concerns arisen, including hazard events in other communities or regions not covered by existing mitigation actions?
- Is new data available to inform the Plan's updates, including data relevant to the hazard profiles and threat assessments?
- Are there any new planning programs, funding sources, or other mechanisms to support hazard mitigation activities in Needles?

Plan Updates

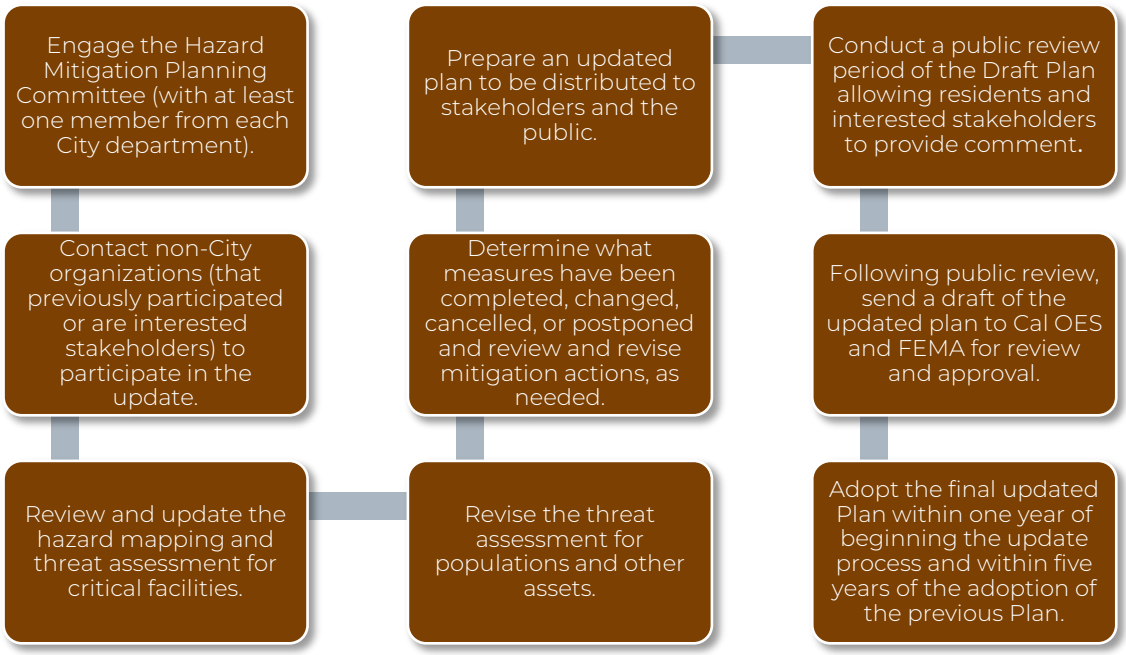
The information in this Plan, including the hazard profiles, threat assessments, and mitigation actions, is based on the best available information, practices, technology, and methods available to the City and HMPC when this Plan was prepared. As factors change, including technologies, community demographics and characteristics, best practices, and hazard conditions, it is necessary to update the Plan to remain relevant. Additionally, Title 44, Section 201.6(d)(3) of the Code of Federal Regulations requires that LHMPs be reviewed, revised, and resubmitted for approval every five years to remain eligible for federal benefits.

Update Method And Schedule

The update process will begin no later than four years after this Plan is adopted, allowing a year for the update process before the Plan expires. However, it is recommended that you begin the update process three years after plan adoption if the funding source for the plan will be a mitigation grant. Depending on the circumstances, the LHMP project manager or their designee may also choose to begin the update process sooner. Some reasons for accelerating the update process may include:

- A presidential disaster declaration for Needles or an area that includes part of or the entire City.
- A hazard event that results in one or more fatalities in Needles.

The update process will add new and updated methods, demographic data, community information, hazard data and events, considerations for threat assessments, mitigation actions, and other necessary information, keeping the Plan relevant and current. The HMPC will determine the best process for updating the Plan, which will include the following steps:



Update Adoption

The Needles City Council is responsible for adopting this Plan and all future updates. As previously mentioned, adoption will occur every five years. The City will begin the update process at least one year before expiration to ensure the plan remains active. If the City has a grant application that relies on the LHMP, an update to the plan will occur no later than 18 months before expiration. Adoption will take place after FEMA notifies the City that the Plan is Approved Pending Adoption. Once the City Council adopts the Plan following FEMA's approval, the adopted plan will be transmitted to FEMA.

Continued Public Involvement

The City will keep the public informed about the HMPC's actions to review and update the LHMP. The HMPC will develop a revised community engagement strategy that reflects the City's updated needs and capabilities. The updated strategy will include a tentative schedule and plan for public meetings, recommendations for using the City's website and social media accounts, and content for public outreach documentation. The HMPC will also distribute information annually through the most appropriate method to ensure the most significant information dissemination to residents and businesses. These updates are anticipated to occur after the City's annual HMPC meeting.

Point Of Contact

The Hazard Mitigation Plan leader for Needles is the primary point of contact for this Plan and future updates. At the time of production, the LHMP project coordinator is Kathy Raasch, Interim Development Services Director, available at kraasch@cityofneedles.com or 760.326.2113, ext. 126.