



Marion County

MULTI-JURISDICTIONAL ALL- HAZARDS MITIGATION PLAN VOLUME II: JURISDICTIONAL ADDENDA

<ul style="list-style-type: none"> ■ Marion County ■ City of Aumsville ■ City of Aurora ■ City of Detroit ■ City of Gervais ■ City of Hubbard ■ City of Idanha ■ City of Jefferson ■ City of Keizer ■ Keizer Fire District 		<ul style="list-style-type: none"> ■ City of Mill City ■ City of Mt Angel ■ Mt Angel Fire District ■ City of Scotts Mills ■ City of Stayton ■ City of Sublimity ■ City of Turner ■ City of Woodburn/ Woodburn Fire District
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Effective Month X, 2022 through Month X, 2027

The 2023 Marion County Multi-Jurisdictional All-Hazard Mitigation Plan (HMP) is a living document that will be reviewed and updated periodically to address the requirements contained in 44 CFR 201. It will be integrated with existing plans, policies, and programs. The Disaster Mitigation Act of 2000 (DMA2K) and the regulations contained in 44 CFR 201 require that jurisdictions maintain an approved mitigation plan to receive federal funds for hazard mitigation grants. This plan meets those requirements as evidenced by FEMA approval which is effective per the cover date range of this plan.

Cover photos: (clockwise from top left): Marion County post-fire scene (2020); City of Detroit post-fire scene 10/20/2020; Tanker tipped on Hwy 22. Photos courtesy of Marion County.

Mission:

Create a more resilient Marion County by partnering with the whole community.

Comments, suggestions, corrections, and additions are encouraged to be submitted from all interested parties.

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O R E G O N

Acknowledgements

The 2022 Marion County Hazard Mitigation Plan (HMP) update was conducted via a multi-jurisdictional partnership of Marion County and the Cities of Aumsville, Aurora, Detroit, Gates, Gervais, Hubbard, Idanha, Jefferson, Keizer, Mill City, Silverton, Stayton, Turner, and Woodburn, and the special districts of Keizer Fire District, Mt. Angel Fire District, and Woodburn Fire District.

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In 2019, the Department of Land Conservation and Development (DLCD) applied for and received a Pre-Disaster Mitigation grant.

PDMC-PL-10-OR-2019-005 from FEMA

through the Oregon Department of Emergency Management (OEM) to assist Marion County.



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The Marion County Multi-Jurisdictional All-Hazard Mitigation Plan (HMP) is comprised of four (4) volumes. These volumes include:

- Volume 1: Basic Plan
- Volume 2: City Addenda
- Volume 3: Appendices
- Volume 4: DOGAMI

To assist the viewer of this plan, each volume as its own table of contents.

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1 City of Aumsville Addendum

1.1 Purpose

This document serves as the City of Aumsville’s Addendum to the Marion County Multi-Jurisdictional Hazards Mitigation Plan (HMP). The purpose of this addendum is to guide the implementation of mitigation actions by Aumsville to improve the resilience of the community. Mitigation planning is a long-term endeavor—one that requires broad internal involvement and community engagement to be successful.

Information contained in Volume I (Basic Plan) and Volume III (Appendices) of the HMP provides additional information (hazard characteristics/events/extent, countywide mitigation actions, and community profile data) and forms the basis of this addendum.

1.2 Plan Process, Participants, and Adoption

In the summer of 2021 Marion County partnered with the Oregon Department of Land Conservation and Development and the Oregon Department of Emergency Management (OEM), and Marion County cities, including Aumsville, to update their addendum to the Marion County Hazard Mitigation Plan, which expired August 16, 2022. This project is funded through the Federal Emergency Management Agency’s (FEMA) FY19 Pre-Disaster Mitigation Competitive Grant Program (PDMC-PL-10-OR-2019-003). By developing this addendum to the Marion County HMP, locally adopting it, and having it approved by FEMA, the City of Aumsville will gain eligibility for FEMA Hazard Mitigation Assistance (HMA) funding that includes three programs: Building Resilient Infrastructure & Communities (BRIC), formerly the Pre-Disaster Mitigation grant program, the Hazard Mitigation Grant Program (HMGP), and the Flood Mitigation Assistance (FMA) program.

The Aumsville City Administrator is the designated local convener of this addendum. The convener delegates authority to staff for the lead in implementing, maintaining, and updating the addendum to the HMP in collaboration with Marion County Emergency Management.

The City of Aumsville will convene a Steering Committee drawing from the following departments to maintain and update the Aumsville addendum and action items:

- Convener, City Administrator
- Public Works Director
- Police representative
- Fire representative
- School District
- Marion County Emergency Management (as necessary)
- Marion County Public Works representative (as necessary)

For the 2022 HMP update, the City of Aumsville held the following meetings:

- On November 4th, 2021, staff from the City of Aumsville (Richard Schmitz, Police Chief, and Steve Oslie, Public Works Director) and the Aumsville Rural Fire Protection District (Brad McKenzie) met with DLCD and Marion County Emergency Management to conduct a Hazard Vulnerability Analysis to evaluate the hazards impacting the city. On November 8th, 2021, DLCD and Chief Schmitz had a follow-up discussion about mitigation actions for the city.
- On March 11, 2022, and March 30, 2022, staff from the City of Aumsville (Matthew Etzel, Assistant Public Works Director and Damian Flowers, Police Sergeant) reviewed and updated the Aumsville draft addendum with Pam Reber, DLCD Natural Hazard Planner.

1.3 Risk Assessment

A risk assessment is intended to provide the “factual basis for activities proposed in the strategy to reduce losses from identified hazards” (Department of Homeland Security, Federal Emergency Management Agency, 2023). This section of the HMP addendum can serve as the factual basis for addressing Oregon Statewide Planning Goal 7 – Areas Subject to Natural Hazards.

1.4 Community Profile

This section provides information on city specific assets and populations. For additional information on the characteristics of the City of Aumsville, in terms of geography, environment, population, demographics, employment and economics, as well as housing and transportation see Volume III, Appendix B, Community Profile. Many of these community characteristics can affect how hazards impact communities and how communities choose to plan for hazard mitigation. Considering the city-specific assets during the planning process can assist in identifying appropriate measures for hazard mitigation.

The City of Aumsville used multiple approaches to engage the public. The Marion County HMP flyer was distributed via the December 2021 issue of City of Aumsville newsletter. City staff is providing regular updates to City Council and plans to present the draft plan to the City Council during an open public council session. City of Aumsville staff attended Marion County HMP Steering Committee meetings and promoted the HMP survey and outreach efforts throughout the plan update.

1.4.1 Community Characteristics

The city of Aumsville is in Marion County, Oregon, southeast of Salem, just south of Hwy 22 at Exit 9. Aumsville is in Oregon’s Willamette Valley, which experiences a moderate climate. In August, the average high temperature is 80 degrees, and the average low temperature is 52 degrees. Wintertime temperatures in January range from an average high of 47 degrees to an average low of 33 degrees. The average annual precipitation is 39.6 inches. Aumsville is bordered on the north by Beaver Creek and on the south by Mill Creek. Mill Creek has a small offshoot on the southeastern side of town called Highberger Ditch. Aumsville is almost completely flat.

The Population Research Center at Portland State University lists Aumsville’s 2020 population at 4,376 which constitutes approximately 1.3% of the population of Marion County. This 2020 population represents a 36.3% increase (1,165 people) from 2010 (Portland State University, Population Research Center, 2021). Median household income in Aumsville 2015-2019 was \$61,620. This is a 13.3% increase from the previous period (2010- 2014) (U.S. Census Bureau, 2022). For more economic demographic information, refer to Volume III, Appendix B: Community Profile.

Figure 1-1, City of Aumsville Map



Source: DLCD, Marion County.

1.5 Critical and Important Facilities

City of Aumsville’s critical and important facilities include the following:

1.5.1 Transportation

- Highway OR-22 (North Santiam Highway)
- Shaw Hwy overpass on Hwy 22
- Aumsville Highway SE
- Mill Creek Bridge on W. Stayton Rd.
- Mill Creek Bridge on W end of Mill Creek Rd (this bridge hosts a fiber optic cable)
- Beaver Creek Bridge on Aumsville Hwy
- Note: City of Aumsville is not responsible for any of these highways or bridges – they are all managed by Marion County or ODOT

1.5.2 Energy

- Electricity Source: Pacific Power
 - All transmission lines, no substations
- Fuel Assets/Needs:
 - The city does not have a fuel station. City Hall does have back-up fuel: diesel generator for a well, City Hall/Police, and Fire District – diesel will last for 24 hours.
 - The Police Department buys fuel from retail fueling source. (Note that the local fuel station probably does not have a back-up power source to pump gas from underground tanks.)
 - Public Works back-up fuel: 500 gallons of diesel, up to 1000 gallons of gas above ground – there are electric pumps now, but fuel could be manually pump if necessary.
 - Wastewater Treatment Plant back-up fuel: diesel generator – diesel will last for 24 hours.
 - Boone Well site #1 back-up fuel: diesel generator – diesel will last for 24 hours.
- School District has propane and diesel back-up.

1.5.3 Water/Wastewater

- Drinking water sources:
 - Reservoir – 1 million gallons
 - Tower Well, located at 195 N. 5th St. (has back-up generator) – 100,000 gallons.
 - Boone Well #1, located at 1105 Main St. (has back-up generator)
 - Reservoir Well, located at 9313 Mill Creek Rd.

- Boone Well #2, located at 1105 Main St.
- Church Well, located at 675 Grizzly St.
- Two water filters that will filter 3,000 gallons per day (pumped from surface water sources).
- Wastewater treatment plant: City operates and is located at 955 Olney St
- Water treatment plant: City operates and is located at 9613 Mill Creek Rd
- Aumsville's five wells deposit water into a 1-million-gallon reservoir. Water is treated before it is stored in the reservoir. Chlorine and Potassium Permanganate is added in the treatment process and chlorine is added as needed in the reservoir. and then distributed out via a booster pump station to water customers.
- The 2015 Water Master Plan includes a section on water conservation, including a list of existing or proposed water conservation programs. The Plan also provides a Water Curtailment Plan with accompanying curtailment actions.

1.5.4 Communication

- Emergency service communication tower is mounted on City Hall.
- Water Tower, 195 N. 5th St.: hosts 4 cellular providers.
- Wastewater Treatment Plant, 955 Olney St.: hosts one cell tower (owned by a cellular provider) with a diesel generator with back-up fuel for 24 hours.
- Telephone (ground line) switching station, 980 Main St.: has a diesel generator with back-up fuel for 24 hours.
- City-owned vehicle mounted radios provide the ability to interconnect Police and Fire
- Police and Fire can dispatch out of the Police Department and Fire stations.

1.5.5 Emergency Services

- Police:
 - Police Department, 597 Main St.
- Fire: Aumsville Rural Fire Protection District
 - 490 Church St.
 - Shaw Station, 5604 Shaw Highway SE
 - Provides coverage for city and county areas served by the district.
- Aumsville Public Works
- Emergency Operations Center is city or the fire department.
- Medical
 - Aumsville Medical Clinic, 205 Main St. (note this is just a doctor's office)

- Shelter:
 - Aumsville community center is a shelter and has a generator, working on MOUs with Willamette Baptist Church and schools.
 - MOUs with Willamette Baptist Church and Schools.

1.5.6 Cultural/Historical Resources

- Old City Hall is the Historic Museum, 599 Main St.
- Events that may have large crowds:
 - June: Emergency Preparedness fair/School Carnival
 - June – August, Mondays & Fridays: Kids summer parks program (run by the city)
 - August: Aumsville Corn Festival (10,000 – 12,000 attendance)
 - November: Saturday before Thanksgiving: Turkey Bingo (500-600 attendance)

1.5.7 Environment and Economy

- The largest employer is Blazer Industry that builds modular homes, etc.
- Agricultural lands surrounding community produces corn, mint, and hazelnuts and grass seed.
- Bedroom community to Salem.

1.5.8 Functional and Access Needs (Vulnerable Populations)

- Schools:
 - Aumsville Elementary School, 572 N. 11th St. (3 separate buildings)
 - Willamette Valley Baptist Church and School, 650 N. 1st St.
 - Kuntry Kids (Daycare), 200 Main St.
- Lower-income areas:
 - S 5th St next to Mill Creek
 - 11th St and Olney

See hazard sections below for potential hazard-related vulnerabilities to these facilities.

1.6 City of Aumsville Plans and Policies

Table 1-1, City of Aumsville Plans and Policies

Document	Year
Aumsville Comprehensive Plan	2022
Development Ordinance Update	2021
Parks Master Plan	2017
Stormwater Master Plan	2000
Water System Master Plan	2015
Wastewater Master Plan & Facilities Plan	2022

Note: Year is year acknowledged or last revision. Source: Aumsville, 2022, Public Works website. <https://www.aumsville.us/publicworks>. 2022, PAPA Database <https://www.oregon.gov/Icd/CPU/Pages/Adopted-Plan-Amendments.aspx>.

1.7 Hazard Profile

Table 1-2, City of Aumsville Hazard Profile and Critical Facilities

Community Overview							
Community Name	Population	# Of Buildings	Critical Facilities ¹	Total Building Value (\$)			
Aumsville	4,215	1,459	5	509,635,000			
Hazus-MH Analysis Summary							
Hazard	Scenario	Potentially Displaced Residents	% Potentially Displaced Residents	Damaged Buildings	Damaged Critical Facilities	Lost Estimate (\$)	Loss Ratio
Flood ²	1% Annual Chance	0	0%	6	0	76,000	0%
Earthquake	Mt. Angel Mw 6.8 Deterministic	36	0.9%	93	2	16,580,652	3.3%
Exposure Analysis Summary							
Hazard	Scenario	Potentially Displaced Residents	% Potentially Displaced Residents	Exposed Buildings	Exposed Critical Facilities	Building Value (\$)	Exposure Ratio
Landslide	High and Very High Susceptibility	0	0.0%	0	0	0	0.0%
Channel Migration	Channel Migration Zone	0	0.0%	0	0	0	0.0%
Wildfire	High and Moderate Risk	0	0.0%	0	0	0	0.0%
Lahar	Medium Zone (1000 to 15000 – Year)	0	0.0%	0	0	0	0.0%
¹ Facilities with multiple buildings were consolidated into one building complex. ² No damage is estimated for exposed structures with “First floor height” above the level of flooding (base flood elevation).							
Critical Facilities							
Critical Facilities by Community	Flood 1% Annual Chance	Earthquake Moderate to Complete Damage	Landslide High and Very High Susceptibility	Channel Migration Zone	Wildfire High or Moderate Risk	Lahar Hazard	
Aumsville Elementary School							
Aumsville Police Department							
Aumsville RFPD		X					
Aumsville Sewage Treatment Plant		X					
Willamette Valley Baptist School							

Source: DOGAMI (2022)

1.8 Hazard Analysis

The methodology for assessing risk was the same for all jurisdictions and a detailed description of the BOLD planning methodology can be found in Volume I, a brief description is below. To complete the risk assessment, the jurisdiction representatives first updated the description, type, location, and extent of each hazard. Next, they updated the Hazard Vulnerability Analysis based on each hazard’s potential impact on the community using a method developed by BOLD Planning. This assessment method ranks the following factors to determine risk from the range of natural hazards identified:

1. Probability (frequency) of event,
2. Magnitude of event,
3. Expected warning time before event, and
4. Expected duration of event.

Score	Probability	Warning Time	Magnitude/Severity	Duration
4	Highly Likely	Less than 6 hours	Catastrophic	More than 1 week
3	Likely	6-12 hours	Critical	Less than 1 week
2	Possible	12-24 hours	Limited	Less than 1 day
1	Unlikely	24+ hours	Negligible	Less than 6 hours

The assessment identifies three levels of risk: High, Moderate and Low.

High - High probability of occurrence; at least 50 percent or more of population at risk from hazard; significant to catastrophic physical impacts to buildings and infrastructure; major loss or potential loss of functionality to all essential facilities (hospital, police, fire, EOC and shelters).

Moderate - Less than 50 percent of population at risk from hazard; moderate physical impacts to buildings and infrastructure; moderate potential for loss of functionality to essential facilities.

Low - Low probability of occurrence or low threat to population; minor physical impacts.

IMPACT	Range Values	
	Low CPRI	High CPRI
High	3.0	4.0
Moderate	2.0	2.9
Low	1.0	1.9

A summary of the hazard vulnerability assessment findings and rankings is presented below.

Table 1-3, City of Aumsville Hazard Vulnerability Assessment – Natural Hazards

Hazard Profile Summary for the <i>City of Aumsville including Aumsville FD</i> using BOLD Planning Analysis Scoring						
Natural Hazard	Probability	Warning Time	Magnitude	Duration	CPRI	2022 Local Planning Significance
Weight Factor	0.45	0.15	0.3	0.1		
Severe Weather/Storm	4	3	3	4	3.6	High
Wildland Interface Fire	3	2	3	4	3.0	High
Drought	3	1	3	4	2.8	Moderate
Earthquake	2	4	3	4	2.8	Moderate
Tornado	2	4	3	4	2.8	Moderate
Extreme Heat	3	1	2	3	2.4	Moderate
Flood (incl. dam failure)	2	2	2	3	2.1	Moderate
Landslide	1	4	1	3	1.7	Low
Volcanic Eruption	1	2	2	3	1.7	Low
Avalanche	1	1	1	1	1.0	Low

Source: Marion County Emergency Management and City of Aumsville, 11/04/2021.

Table 1-4, City of Aumsville Hazard Vulnerability Assessment – Non-Natural Hazards

Hazard Profile Summary for the <i>City of Aumsville including Aumsville FD</i> using BOLD Planning Analysis Scoring						
Non-Natural Hazard	Probability	Warning Time	Magnitude	Duration	CPRI	2022 Local Planning Significance
Weight Factor	0.45	0.15	0.3	0.1		
Terrorism, Active Shooter, Workplace Violence	2	4	4	4	3.1	High
Cyberterrorism	2	4	3	4	2.8	Moderate
Hazardous Materials Release - Transportation	2	4	3	3	2.7	Moderate
Unauthorized Entry	2	4	2	4	2.5	Moderate
Fire - Residential / Commercial (Arson)	2	4	2	3	2.4	Moderate
Agricultural Terrorism	1	1	1	1	1.0	Low
Chemical, Biological, Radiological, Nuclear, Explosive	1	1	1	1	1.0	Low
Hazardous Materials - Non-Transportation	1	1	1	1	1.0	Low
Public Health	1	1	1	1	1.0	Low

Source: Marion County Emergency Management and City of Aumsville, 11/04/2021.

1.9 Hazard Characteristics

Hazard History, Characteristics and Extent for Marion County apply also to the City of Aumsville. Volume I, Section 2, Risk Assessment, adequately describes the characteristics of natural hazards, as well as the location and extent of potential events.

The following section identifies vulnerabilities specific to the City of Aumsville, recent localized hazard events and impacts, and illustrates the basis for the city's HVA scores.

1.9.1 Avalanche

CPRI = 1.0, Risk Level: Low

Event – NA

Vulnerability – None

1.9.2 Drought

CPRI=2.8 Risk Level: Moderate

Events: In 2021, there was an event where a pump was lost during a period of extended heat; 14' of water was lost in the city's reservoir. This was the driver for securing additional storage and supply.

Vulnerability: The city is doing extensive resilience work on their water storage and the city coordinates messages on water conservation with the Aumsville RFPD and uses the utility bill and newsletter to educate the community. But an extreme drought could result in a water shortage. The city has 1 million gallons of storage. The city approved \$3.5 million in funding for an additional 1 million gallons and 2 additional wells; the city holds unused water rights. The city had a well-siting study done that shows that city-owned sites could produce 400 gallons per minute (45% increase to water supply) water rights. The city had a well-siting study done that shows that city-owned sites could produce 400 gallons per minute (45% increase to water supply).

1.9.3 Earthquake

CPRI = 2.8, Risk Level: Moderate

Events: No damaging earthquake events occurred during the previous five years. On March 25, 1993, a Mw 5.7 earthquake occurred with an epicenter approximately 3 miles east of the City of Scotts Mills, Oregon. Many buildings were damaged from the event, including the capitol building in Salem. The many unreinforced buildings in the area were significantly damaged due to intense shaking. The 1993 Scott Mills quake caused \$28 million in damages to cities throughout Marion County.

Vulnerability: There is one locally active fault within the Aumsville city limits, one crossing over on the far northwest corner of the town. Other active faults also exist about six miles to the northwest and west. Vulnerable structures include the museum (unreinforced masonry) and the Aumsville Elementary School.

A 100,000-gallon elevated tank may need seismic retrofits. A new 1-million-gallon reservoir should be resilient; the current 1-million-gallon reservoir needs seismic upgrades which will be implemented after the new reservoir is constructed.

1.9.4 Extreme Heat

CPRI = 2.4, Risk Level: Moderate

Events: No conservation orders, annual water conservation advisories/education.

Vulnerability: City has started a vulnerable population list for response to an extreme heatwave (also power outages, wildfire smoke, etc.); Water supply was stressed in recent years, but new reservoir should address.

1.9.5 Flood

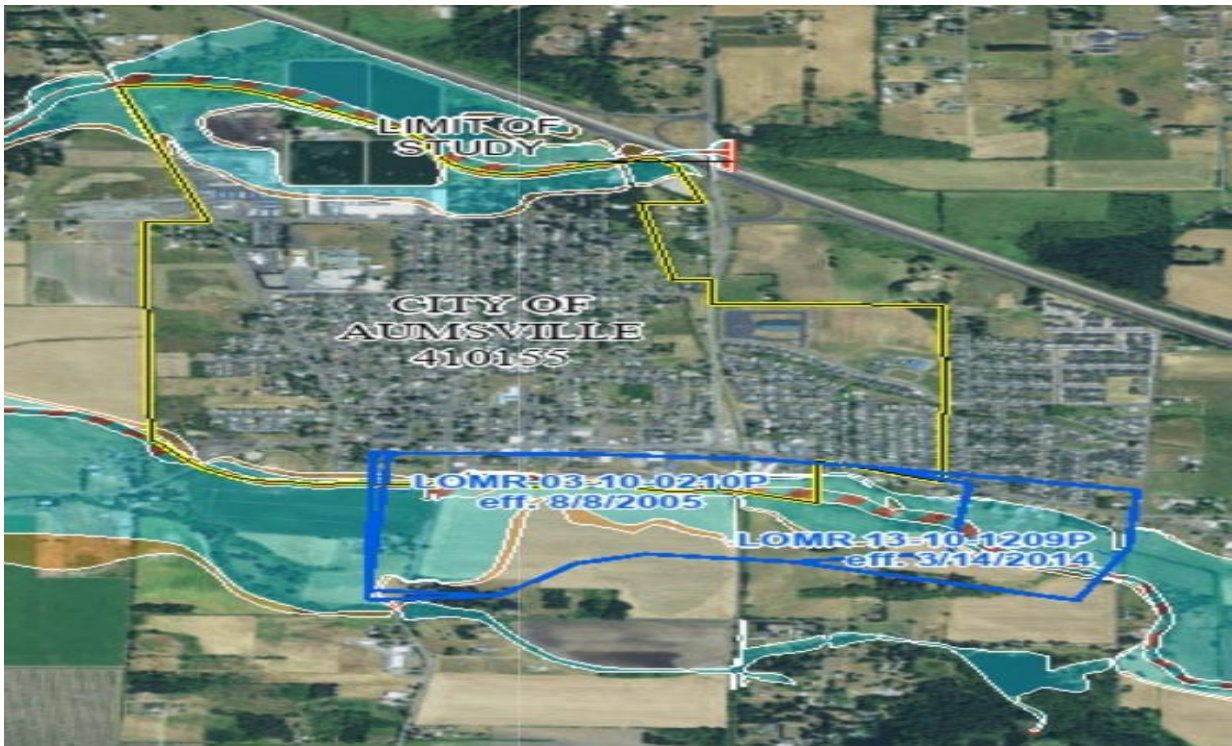
CPRI = 2.1, Risk Level: Moderate

Events: No major flood events 2017-2021.

Vulnerability: Certain residential areas; sewage lagoons; rural highway outlets to town.

Portions of Aumsville have areas of flood plains (special flood hazard areas). These include areas along Mill Creek and the High Berger Ditch, and Beaver Creek (see Figure 1-2). Furthermore, other portions of Aumsville, outside of the mapped floodplains, are also subject to significant, repetitive flooding from local storm water drainage.

Figure 1-2, Aumsville Flood Hazard Map



Source: FEMA Map Service Center, 5/25/2022. <https://msc.fema.gov/>

Historically, Aumsville has experienced major floods in 1996, around 2000, and in 2011. Since then, no major floods have affected the population, but Aumsville continues to experience regular localized flooding during the wet season. In particular, the steering committee noted issues along Bishop Road, 1st Street, and in the Highberger Ditch area. The steering committee also noted that Porter Boone and Mill Creek Parks often flood during the winter. According to the steering committee, many of the flooding issues affecting Aumsville can be attributed to poor ditch maintenance.

1.9.6 Landslide

CPRI = 1.7, Risk Level: Low

Events: n/a

Vulnerability: Aumsville is very flat, there is no landslide risk.

1.9.7 Severe Weather

CPRI = 3.6, Risk Level: High

Events: Ice storm in 2021 resulted in 4 days without power and communication (cell, internet, regular phone).

Vulnerability: Significant wind events occur in Aumsville each year, sometimes interrupting services, downing trees, and causing power outages. Because windstorms typically occur during winter months, they are sometimes accompanied by ice, freezing rain, flooding, and very rarely, snow.

1.9.8 Tornado

CPRI=2.8, Risk Level: Moderate

Events: Aumsville tornado December 14, 2010.

Vulnerability: In December 2010, a tornado touched down in Aumsville, causing around \$1.2 million dollars in damage. Nichols Plumbing had their building destroyed, scattering plumbing parts across the street. Other building damage included a house, a metal building, and the roofs of several manufactured were damaged. Since this event, Aumsville has not experienced wind events that were quite as severe.

1.9.9 Wildfire

CPRI = 3.0, Risk Level: High

Events: n/a

Vulnerability: Aumsville is surrounded by agricultural lands which are highly managed and pose low risk for wildfire.

1.9.10 Volcanic Eruption

CPRI = 1.7, Risk Level: Low

Events: 1980 Mount St Helens eruption.

Vulnerability: The City would have several hours before ash from an eruption of Mt. Hood, or another volcano impacted the community; impacts could last more than a week.

1.9.11 Mitigation Strategy

During the 2022 Marion County Hazard Mitigation Plan and Aumsville Addendum update process, the Oregon Department of Land Conservation & Development and Aumsville city staff developed a list of priority actions. Actions that were thought to be relevant but not considered to be priorities were placed in the Action Item Pool for consideration at annual plan review meetings.

1.9.12 Mitigation Success

Aumsville is upgrading their water supply by putting the water rights they have, to work and building sufficient storage capacity to endure low production times, pump failures, and other risks. A 100,000-gallon elevated tank may need seismic retrofits. If these are too costly however, the tower will just be used as a communications tower. A new 1-million-gallon reservoir will be built to seismic standards; and the current 1-million-gallon reservoir needs seismic upgrades which will be implemented after the new reservoir is constructed. The city is also active in messaging to the community about water conservation and what is needed for a resilient water system.

1.9.13 Mitigation Actions

- Aumsville requires that new development puts new power lines underground. Undergrounding electric utilities is included in the city's development standards; it is a criterion for new construction. The city also encourages Pacific Power to underground lines as much as they are able.
- Include emergency preparedness resources in the city's monthly newsletter.
- Hold an annual preparedness fair.
- Participate in the Marion County's MORE Agreement.
- Develop stronger connections with the business community and encourage businesses to develop continuity of operations plans.
- Participate in Marion County Drought Contingency Plan update.

1.9.14 City of Aumsville Mitigation Table

The following pages include the City's Priority Action Items (Table 1.5) and Action Item Status Report (Table 1.6).

Table 1-5, City of Aumsville and Aumsville Fire District Mitigation Actions

City of Aumsville and Aumsville Fire District Priority Mitigation Actions 2022-2027							
#	Hazard	Mitigation Action	Priority	Timeline	Cost	Description	Status
2022-MH-01	Multi-Hazard	Develop a communications plan between the city, police, and fire. This will include purchasing more radios so all key personnel can be in contact during an emergency.	H	1-3 Years	\$25-75k	Include Incident Command System (ICS) and National Incident Management System (NIMS) training in the communication plan development.	Not Started
2022-MH-02	Multi-Hazard	Update the City's Evacuation and Mass Care Plan. Important components include List of vulnerable populations, Fuel Management and access plan, Detailed Asset Inventory	H	1-3 Years	\$25-75k	Revised City EOP action items, Continuation/edit of 2017 MH-02, Update City's Evacuation and Mass Care plan	New
2022-MH-03	Multi-Hazard	Develop a MOU with facilities that could function as emergency shelter during a hazard event.	H	1-3 Years	\$5-10k	Brought over from 2017 plan, #MH-5	Not Started
2022-MH-04	Multi-Hazard	Identify and purchase materials the city needs to operate successfully in all emergency situations.	M	1-5 Years	\$250k-\$1.5 million	Generators at all locations. Church and Boone currently do not have generators, Include generators in all future well projects. Generator at new PW facility.	Started
2022-MH-05	Multi-Hazard	Develop MOU with local gas stations that give emergency services first access to stations stored fuel.	M	2-5 Years	Staff time	Tentative gas station agreements but they need backup generator. Brought over from 2017 plan #MH-1	Started
2022-MH-06	Multi-Hazard	Update the City's Comprehensive Plan to reflect Statewide Land use Goal 7 language surrounding natural hazards	M	2-5 Years	Staff time	Consider using the County's HMP hazard chapters to update the Goal 7 section with hazard characterization, events, special city vulnerabilities and recommendations for policies and strategies to protect the city from hazards. Was brought over from 2017 plan, #MH-06	Not Started
2022-EQ-01	Earthquake	Conduct a seismic analysis on the empty elevated water tank.	H	2-5 Years	\$8-15k	Working with Engineer of Record to draft a report on the seismic analysis of the empty tank with Cell Phone antennas still on tower with no water.	Started

#	Hazard	Mitigation Action	Priority	Timeline	Cost	Description	Status
2022-EQ-02	Earthquake	Complete seismic assessment on critical facilities (water tower assessment currently underway). Retrofit facilities based on recommendations of the assessment.	H	2-5 Years	\$10k-\$3.5 million	Seismic Analysis was done on elevated tank and showed 1.5+ Million in needed retrofits. Redoing analysis on tank empty now that City is constructing a new 1-million-gallon reservoir. Existing 1-million-gallon reservoir will need seismic upgrades once construction of new tank is complete.	Started
2022-EQ-03	Earthquake	Support school district's efforts to secure a bond for school seismic retrofitting.	H	2-5 Years	Staff time	Help advertise the need for retrofits in newsletter??	Not Started
2022-EQ-04	Earthquake	Consider requiring new city facilities to exceed the minimum structural requirements for seismic loading.	M	2-5 Years	TBD	Lead: City Council Partners: Marion Co. Building Inspection	Not Started
2022-EQ-05	Earthquake	Encourage residents to prepare and maintain 2-week survival kits.	M	0-18 months	TBD	Newsletter articles from Marion County Emergency Management and Police Chief.	Started
2022-EQ-06	Earthquake	Send employees to an ATC 20 training	M	0-18 months	TBD	Brought over 2017 HMP, EQ-08	Not Started
2022-FL-01	Flood	Remove culvert on Gordon Lane at 1st Street; replace with a bridge.	M	5-10 Years	\$2 million	To prevent potential flooding in the Highberger Estates subdivision or 1st Street. To be implemented with development; the city will have an engineered set of drawings (\$400k). Funding: city budget, developer	Started
2022-FL-02	Flood	Upsize culverts on Bishop Rd.	M	5-10 Years	\$1 million	To prevent potential flooding to Highberger Estates and Bishop Road. To be implemented with development. Funding: city budget, developer	Not Started
2022-FL-03	Flood	Update the stormwater management plan	M	2-5 Years	\$50-\$60k	Continued 2017 P-3 Funding: FEMA	Started

Table 1-6, City of Aumsville Action Item Status Report

2017-2022 City of Aumsville & Aumsville Fire District Action Status Update					
#	Hazard	Mitigation Action	Description	Coordinating Organization	Status
2017-MH-01	Multi-Hazard	Develop MOU with the gas station that gives emergency services first access to station's stored fuel.	Tentative gas station agreement but they need backup power. 2022 MH-05	City Administration	Started
2017-MH-02	Multi-Hazard	Update the City's Emergency Operations Plan. Important components to include are: -A list of vulnerable populations -Fuel management and access plan -Detailed asset inventory	All sub items are complete. Follow up to confirm that the city is working towards its own EOP or if it is coordinating with the County's EOP. The city has emergency response plans for the water and wastewater systems. 2022 MH-02	Police Chief, Public Works, and City staff	Complete or revised
2017-MH-03	Multi-Hazard	Identify and purchase materials the city needs to operate successfully in an emergency.	2022 MH-04	City Administration	Started
2017-MH-04	Multi-Hazard	Develop a communications plan between the city, Police, and Fire. This will include purchasing more radios so all key personnel can be in contact during an emergency.	2022 MH-01	City Administration and Police Chief	Started
2017-MH-05	Multi-Hazard	Develop a memorandum of understanding with facilities that could function as emergency shelters during a hazard event.	2022 MH-03	City Administration	No Started
2017-MH-06	Multi-Hazard	Update the Aumsville Comprehensive Plan to reflect statewide land use Goal 7 language surrounding natural hazards.	2022 MH-06 Consider using the Marion Co HMP hazard chapters to update the Goal 7 section with: hazard characterization, events, specific city vulnerabilities, and recommendations for policies and strategies to protect the city from these hazards.	City Administration	Not started
2017-MH-07	Multi-Hazard	Include emergency preparedness resources in the city's monthly newsletter	Moved to ongoing mitigation actions.	City Executive Office	Started
2017-MH-08	Multi-Hazard	Hold an annual preparedness fair.	Moved to ongoing mitigation actions.	City Executive Office	Not Started
2017-MH-09	Multi-Hazard	Participate in the Marion County's MORE Agreement.	Moved to ongoing mitigation actions.	City Administration	No Started
2017-MH-10	Multi-Hazard	Develop stronger connections with the business community and encourage businesses to develop continuity of operations plans.	Moved to ongoing mitigation actions.	City Administration	Started

#	Hazard	Mitigation Action	Description	Coordinating Organization	Status
2017-DR-01	Drought	Partner with Marion County to support local agencies' training on water conservation measures.		Public Works	Complete
2017-DR-02	Drought	Participate in Marion County Drought Contingency Plan.	Moved to Ongoing.	Public Works	Not Started
2017-P4/EQ-00	Earthquake	Assess the seismic vulnerability of the City's reservoir (as described in the 2015 Water Plan). Retrofit facility as funding becomes available.	The analysis showed the need for seismic upgrades to be greater than the cost than replacing the tank.	Public Works	Complete/ Revised 2022 EQ-02
2017-EQ-01	Earthquake	Complete seismic assessment on critical facilities (water tower assessment currently underway). Retrofit facilities based on recommendations of the assessment.	complete part 1; USE ongoing doing another analysis based on the tank being empty.	Public Works	Ongoing
2017-EQ-02	Earthquake	School seismic retrofitting action – need to talk to school district representative.	Discuss replacement of Aumsville Elementary School with the school district.	School District	School District action item
2017-EQ-03	Earthquake	Purchase a 4-wheel drive vehicle that could provide transportation if major access points to the city are not passable.	City to purchase two 4x4 vehicles; one has been received; the other is coming but delayed due to supply chain issue.	Public Works	Complete
2017-EQ-04	Earthquake	Consider requiring new city facilities to exceed the minimum structural requirements for seismic loading.		City Council	Not Started
2017-EQ-05	Earthquake	Install automatic shut-off valves in all city facilities that use natural gas.		Public Works	Complete
2017-EQ-06	Earthquake	Develop dam inundation maps.		FEMA	Discontinue
2017-EQ-07	Earthquake	Encourage residents to prepare and maintain 2-week survival kits.		City Executive Office	Not Started
2017-EQ-08	Earthquake	Send employees to Marion County's ATC 20 training.		City Executive Office	Not Started
2017-FL-1	Flood	Remove culvert on 1 st and Gordon and replace with a bridge.	Design completed in 2022.	City Administration/ Public Works	Started/ 2022 FL-01
2017-FL-2	Flood	Upsize culverts on Bishop Rd.		City Administration/ Public Works	Not Started/ 2022 FL-02
2017-FL-03	Flood	Create an agreement for flood mitigation along Beaver Creek and Mill Creek/ Highberger Ditch	Discontinued except	City Administration	Discontinued

#	Hazard	Mitigation Action	Description	Coordinating Organization	Status
2017-FL-03	Flood	<p>Create an agreement for flood mitigation along Beaver Creek and Mill Creek/ Highberger Ditch (agreement would have to be regional). Aumsville could do the following:</p> <ul style="list-style-type: none"> • Use city property as a water detention space. • Increase the detention capacity to accommodate effects of new development. <p>Update the Stormwater Management Plan.</p>	Discontinued except, 2022 FL-03 Update Stormwater Management Plan	City Administration	Discontinued
2017-SW-01	Severe Weather	Require new development to put power lines underground.	Included in the city's development standards, a criterion for new construction. See Ongoing Mitigation Action section.	City Administration	Complete
2017-SW-02	Severe Weather	Encourage Pacific Power to underground lines as they are able.	See Ongoing Mitigation Action section.	City Administration	Complete

Source: City of Aumsville, 3/30/2022

2 City of Aurora Addendum

2.1 Purpose

This document serves as the City of Aurora’s Addendum to the Marion County Multi-Jurisdictional Hazards Mitigation Plan (HMP). The purpose of this addendum is to guide the implementation of mitigation actions by the City of Aurora to improve the resilience of the community. Please note that mitigation planning is a long-term endeavor—one that requires broad internal involvement and community engagement to be successful. Finally, please refer to the information contained in Volume I (Basic Plan) and Volume III (Appendices) of this HMP, which provides additional information (particularly regarding participation and mitigation strategy) and forms the basis of this addendum.

2.2 Plan Process, Participation, and Adoption

In 2021 and early 2022, Marion County partnered with the Oregon Department of Land Conservation and Development (DLCD) and the Oregon Department of Emergency Management (OEM), and Marion County cities, including the City of Aurora, to update their addendum to the Marion County Hazard Mitigation Plan, which expired August 16, 2022.

This project is funded through the Federal Emergency Management Agency’s (FEMA) FY19 Pre-Disaster Mitigation Competitive Grant Program (PDMC-PL-10-OR-2019-003). The City of Aurora joined the Marion County HMP update by executing an intergovernmental agreement with DLCD on December 14, 2021.

By developing this addendum to the Marion County HMP, locally adopting it, and having it approved by FEMA, the City of Aurora will gain eligibility for FEMA Hazard Mitigation Assistance (HMA) funding that includes three programs: Building Resilient Infrastructure & Communities (BRIC), formerly the Pre-Disaster Mitigation grant program, the Hazard Mitigation Grant Program (HMGP), and the Flood Mitigation Assistance (FMA) program.

The City of Aurora Steering Committee is comprised of the following:

- Convener, City of Aurora City Recorder
- City of Aurora Administrative Assistant
- City of Aurora Wastewater Treatment Plant Operator
- City of Aurora Finance Officer
- Marion County Sheriff
- Fire Chief, Aurora Rural Fire Protection District
- North Marion School District – Public/Private Schools K-12
- Marion County Emergency Management Representative (as necessary)
- American Red Cross Representative
- CenturyTel Representative
- Willamette Broadband Representative
- Northwest Natural Gas Representative
- Portland General Electric Representative

On November 16, 2021, Stuart Rodgers (Aurora City Recorder), Mike Corless (Aurora Rural Fire Protection District Assistant Fire Chief), Josh Williams (Aurora RFPD District Chief), Marion County Emergency Preparedness Coordinator Mike Hintz, and DLCD Planner Tricia Sears conducted a risk assessment meeting with the City of Aurora that included a Hazard Vulnerability Assessment ranking. This addendum was updated on June 15, 2022, in a meeting with Stuart Rodgers, Mark Gunter (Public Works Director), and Pam Reber (DLCD). The City of Aurora staff holds regular meetings with Aurora RFPD and coordinates on all relevant issues to the City. The Aurora Preparedness Group is a nonprofit organization that is funded by the City where the City, Fire District, and School District coordinate regularly on mitigation action items. The City of Aurora publicly notified the local community about this plan update process by linking to the Marion County Emergency Management webpage.

2.3 Risk Assessment

A risk assessment is intended to provide the “factual basis for activities proposed in the strategy to reduce losses from identified hazards” (Department of Homeland Security, Federal Emergency Management Agency, 2023). This section of the HMP addendum can serve as the factual basis for addressing Oregon Statewide Planning Goal 7 – Areas Subject to Natural Hazards.

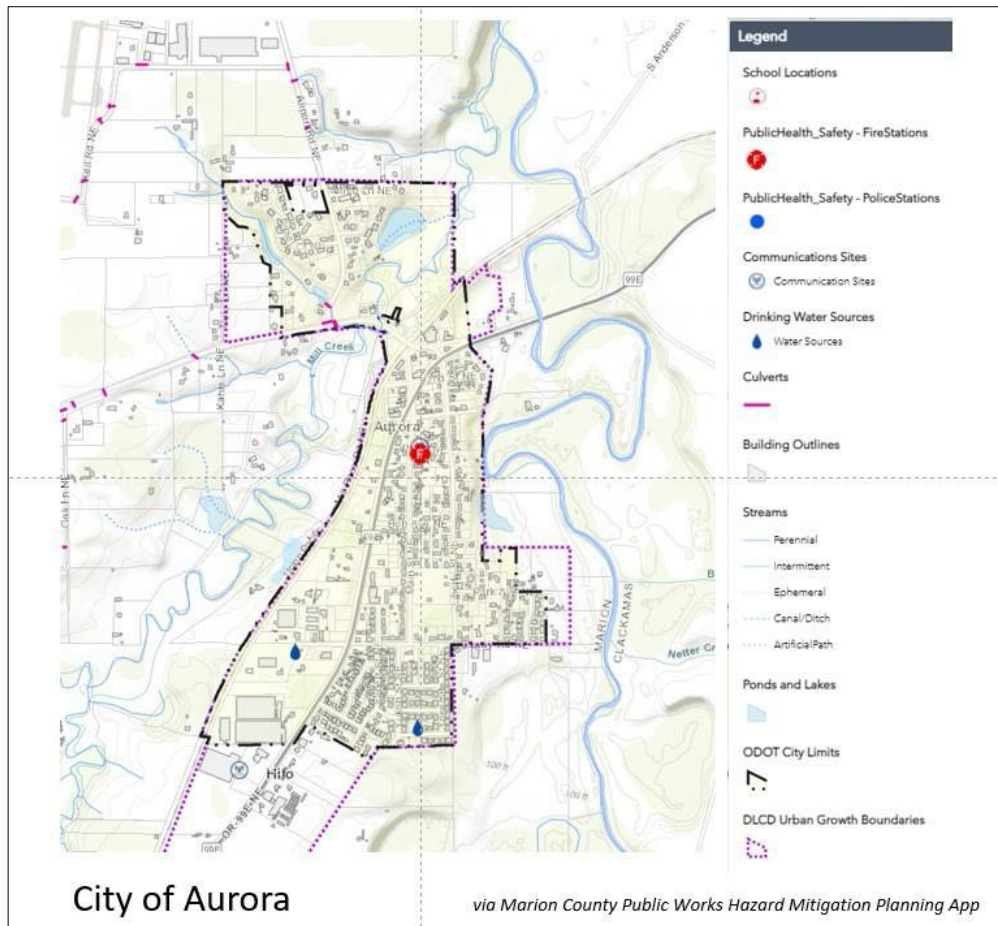
2.4 Community Profile

This section provides information on city specific assets and populations. For additional information on the characteristics of City of Aurora, in terms of geography, environment, population, demographics, employment and economics, as well as housing and transportation see Volume III, Appendix B, Community Profile. Many of these community characteristics can affect how hazards impact communities and how communities choose to plan for hazard mitigation. Considering the city specific assets during the planning process can assist in identifying appropriate measures for hazard mitigation.

2.4.1 Community Characteristics

The City of Aurora is in the Willamette Valley in Marion County, Oregon, approximately 23 miles south of the city of Portland. The Aurora experiences a moderate climate with an average high temperature of 82 degrees and low of 54 degrees in August, and an average high temperature of 47 and low of 35 in January. The city receives an average annual precipitation of 40.67 inches. Aurora is located on a gently sloping hill bordered by Mill Creek to the west and the Pudding River to the east. Surrounding the rural community is hilly farm and forest land. The Population Research Center at Portland State University lists Aurora’s 2020 population at 1,023. This represents a 36% increase from 2000 (Portland State University, Population Research Center, 2021). For more demographic information, refer to Volume III, Appendix B – Community Profile.

Figure 2-1, City of Aurora Map



2.4.2 Economy

Historically, Aurora’s economy focused on agriculture and manufacturing, which remain major employment sectors today. The city also has large heritage tourism component, which capitalizes on Aurora’s history as a religious colony and large number of historic buildings dating to the 1850s. Aurora is also known as the “Antique Capital,” and the city’s downtown has several large antiques retailers which draw several visitors to the community. Median household income in Aurora during the period 2015-2019 was \$87,632, an 11.6% increase from the previous 5-year period (U.S. Census Bureau, 2022). For more economic information, refer to Volume III, Appendix B – Community Profile.

2.5 Critical and Important Facilities

Aurora's critical and important facilities include the following:

2.5.1 Transportation

- Two bridges provide primary access to the city from I-5 and Hwy 99E:
 - Mill Creek Bridge (County-owned) – City sewer and water co-located.
 - Pudding River Bridge (ODOT-owned)
 - If either collapsed, transportation in and out of the city would require lengthy detours.
- Aurora State Airport, 22801 Airport Rd NE, Aurora
- School district: contracts out bus service to Canby (diesel)
- Canby CAT bus runs along Hwy 99E between Canby and Woodburn
- Note: Hwy 99E and Ehlen Rd are the only 2 entrances to town (if bridges are out, it would be difficult to get in and out).
- Note: Intersection of Ehlen Rd. and the railroad tracks is dangerous.
- Note: The wastewater treatment plant is across a bridge – in the event of a train derailment or bridge collapse, the wastewater treatment plant would not be accessible.

2.5.2 Energy

- PGE – electricity (all above ground lines)
- NW Natural – natural gas
- The city gets fuel from Shell Station in town.
- Fire gets fuel from various gas stations.
- City Hall (21420 Main St.) would likely shut down without power, even if the building did withstand seismic activity. City Hall does not currently have a backup generator.
- Fire Station (21390 Main St.) has a generator that would run the whole station. The generator runs on natural gas but could also run on propane. The fire station does not keep reserves of natural gas or propane.
- Public Works has backup power at the wastewater treatment plant.
- Wastewater treatment plant staff are in the process of purchasing a new generator for the facility, and currently have backup generators at both pump stations.

2.5.3 Water / Wastewater

- City water and wastewater
 - Water treatment plant (14682 Ottaway Rd.) – Includes filtration system and a reservoir that treats water drawn from 5 city wells. Water from the treatment plant is then pumped back to the residents.

- Three city wells have generators, 2 do not, and there is 1 traveling diesel generator.
- The wastewater treatment plant (21496 Mill Race Rd.) was completed in 2001 and serves a maximum capacity of 2,000 residents.
- City has 4 water wells, #1 Well has gone down and city is working on replacing it, cost approx. \$1.4 million to replace (land purchase, construction); Storm water project also, 24-36 million for both, going after a bond Levey in 2022. The drinking water system needs to be replaced and the city will be coordinating with partners on this. Wells are used to fill storage tanks, which supplies the fire protection (hydrant system) in the city.

Note: Sewer pump station is vulnerable to Mill Creek flooding events, and the wastewater treatment plant could be vulnerable as well.

Note: The water tower in town does not have water, just communications.

- North Marion School District Water and Wastewater:
 - Two wells and a 355,000-gallon water tank with its own filtration system. This system is equipped with a propane back-up generator. Propane is stored in a 100-gallon above ground storage tank.
 - Sewer system, equipped with a propane back-up generator.

2.5.4 Communication

- City Communications:
 - The city has a server with a redundant backup system offsite.
 - Public Works has a cell phone and radio capabilities; radio training is planned internally.
 - Regional emergency communication improvements are underway.
- Water Tower (this is a communications tower; it does not hold water):
 - The Fire District has their communications located on the water tower. They also have a backup generator.
 - The Sheriff has communications equipment located on the water tower, but it is currently turned off.
 - Three cell phone companies – Verizon, Sprint, AT&T – use the water tower and they all have backup generators.
- North Marion School District:
 - The School District has a radio connection with the County and other emergency responders, along with emergency backup power.

2.5.5 Emergency Services

- Police:
 - Located at City Hall (21420 NE Main St., Aurora, OR) – the Marion County Sheriff provides police services.
- Fire: Aurora Rural Fire Protection District
 - Located at 21390 NE Main St., Aurora, OR
 - Aurora Fire Station seismic upgrades are complete.
- Medical (none in Aurora):
 - Woodburn and Canby have immediate care facilities (Providence in Canby – sometimes not staffed by doctors, Legacy in Woodburn).
 - Meridian Park Hospital in Tualatin
 - Willamette Falls Hospital in Oregon City
 - Silverton Hospital in Silverton
 - Providence Medical Center in Newberg
 - Salem General Hospital
 - Ambulances are out of Woodburn, secondary out of Canby, third out of Wilsonville or Tualatin.

2.5.6 Cultural / Historical Resources

- Historic district encompasses 150 acres of the city and includes buildings and historic sites, including:
 - Aurora Old Colony Historical Museum (15038 2nd St.)
 - George Steinbach Cabin & Ox Barn (15018 2nd St.)
 - Giesy-Kraus House (15028 2nd St NE) c. 1875
 - This house was moved from 3rd & Main Street.
 - Jacob Miller House Shed (15038 2nd St NE) c. 1890
 - Siebert House (15048 2nd St NE) c. 1890
 - Unnamed (15058 2nd St NE) c. 1872
 - This house was moved from 2nd & Main Street.
 - Jacob Miller House (21624 Liberty St. NE) c. 1890
 - Charles Snyder House (14996 3rd St NE) Built 1875-1880
 - Ernest Snyder House (21328 Hwy 99E NE) c. 1890
 - Emmanuel Keil House (14643 Ehlen Rd. NE) Built 1903-1905.
 - Frederick Keil House & Grounds (21883 Airport Rd NE)

- Joseph Miller House (21892 Airport Rd NE) c. 1890
- Southern Pacific RR Hop & Ziegler Warehouse (14971 1st St NE) c. 1885
- Unknown/ “California Storefront” (21781 Main St. NE) c. 1890
- Aurora State Bank (21690 Main St NE) c. 1905
- Wm. Keil & Co. General Merchandise Store (21581 Main St NE) c. 1871
 - The Octagon Building is in the rear yard of this property.
- Frederick Will House (21361 Main St NE) c. 1905
- Events that may have large crowds:
 - City Hall – court held here Wednesdays every other month starting in February (every even month). Monthly Tuesday meetings 1st-4th for public meetings (council, planning commission, parks).
 - American Legion Hall: church services on Sundays
 - Aurora Presbyterian Church & Christ Lutheran Church: services on Sundays
 - McLaren Auction House: some evening events
 - Aurora Historical Museum: Colony Hand Spinners Guild in March and Strawberry Social in June
 - Mothers’ Day weekend: wine and chocolate walk.
 - August: Aurora Colony Days Festival – biggest event of the year with a couple thousand visitors.
 - Summer: Music in the Park on Wednesday nights
 - School District events

Functional and Access Needs (Vulnerable Populations)

- School’s: (no school’s within the city limits):
 - North Marion Primary School
 - North Marion Middle School
 - North Marion Intermediate School
 - North Marion High School
 - 2,000 students and 250 staff on the 55-acre North Marion School District property (20246 Grim Rd.)
- Areas proximate to but not served by City water and sewer service:
 - Deer Creek Trailer Park (outside of city limits; southwest of the airport) Note: Aurora is a retirement community, so there may be residents with special medical needs.

See hazard sections below and Section 2, Risk Assessment, for potential hazard vulnerabilities to these facilities.

2.6 Plans and Policies

Table 2-1, Plans and Policies, City of Aurora

Document Name	Year
Comprehensive Plan & Zoning Map	2019
Wastewater Facilities Planning Study	2017
Transportation System Plan	2009
Stormwater Master Plan	2021
Water System Master Plan	2009
Water Management and Conservation Plan	2009

2.7 Hazard Profile

Table 2-2, City of Aurora Hazard Profile

Community Overview							
Community Name	Population	# Of Buildings		Critical Facilities ¹	Total Building Value (\$)		
Aurora	985	560		2	258,763,000		
Hazus-MH Analysis Summary							
Hazard	Scenario	Potentially Displaced Residents	% Potentially Displaced Residents	Damaged Buildings	Damaged Critical Facilities	Lost Estimate (\$)	Loss Ratio
Flood ²	1% Annual Chance	0	0%	2	0	7,000	0%
Earthquake	Mt. Angel Mw 6.8 Deterministic	32	3.3%	100	2	31,708,988	12%
Exposure Analysis Summary							
Hazard	Scenario	Potentially Displaced Residents	% Potentially Displaced Residents	Exposed Buildings	Exposed Critical Facilities	Building Value (\$)	Exposure Ratio
Landslide	High and Very High Susceptibility	27	2.7%	15	0	5,511,000	2.1%
Channel Migration	Channel Migration Zone	0	0%	1	0	118,000	0.05%
Wildfire	High and Moderate Risk	0	0%	0	0	0	0%
Lahar	Medium Zone (1000 to 15000 – Year)	0	0%	0	0	0	0%
¹ Facilities with multiple buildings were consolidated into one building complex. ² No damage is estimated for exposed structures with “First floor height” above the level of flooding (base flood elevation).							
Critical Facilities							
Critical Facilities by Community	Flood 1% Annual Chance	Earthquake Moderate to Complete Damage	Landslide High and Very High Susceptibility	Channel Migration Zone	Wildfire High or Moderate Risk	Lahar Hazard	
None Reported							

Source: DOGAMI (2022)

2.8 Hazard Analysis

The methodology for assessing risk was the same for all jurisdictions and a detailed description of the BOLD planning methodology can be found in Volume I, a brief description is below. To complete the risk assessment, the jurisdiction representatives first updated the description, type, location, and extent of each hazard. Next, they updated the Hazard Vulnerability Analysis based on each hazard’s potential impact on the community using a calculated priority risk index (CPRI) methodology developed by BOLD Planning. This assessment method ranks the following factors to determine risk from the range of natural hazards identified:

1. Probability (frequency) of event,
2. Magnitude of event,
3. Expected warning time before event, and
4. Expected duration of event.

Score	Probability	Warning Time	Magnitude/Severity	Duration
4	Highly Likely	Less than 6 hours	Catastrophic	More than 1 week
3	Likely	6-12 hours	Critical	Less than 1 week
2	Possible	12-24 hours	Limited	Less than 1 day
1	Unlikely	24+ hours	Negligible	Less than 6 hours

The assessment identifies three levels of risk: High, Moderate and Low.

High - High probability of occurrence; at least 50 percent or more of population at risk from hazard; significant to catastrophic physical impacts to buildings and infrastructure; major loss or potential loss of functionality to all essential facilities (hospital, police, fire, EOC and shelters).

Moderate - Less than 50 percent of population at risk from hazard; moderate physical impacts to buildings and infrastructure; moderate potential for loss of functionality to essential facilities.

Low - Low probability of occurrence or low threat to population; minor physical impacts.

IMPACT	Range Values	
	Low CPRI	High CPRI
High	3.0	4.0
Moderate	2.0	2.9
Low	1.0	1.9

A summary of the risk assessment findings and rankings is presented below.

Table 2-3, City of Aurora Hazard Vulnerability Assessment – Natural Hazards

Hazard Profile Summary for the <u>City of Aurora</u> using BOLD Planning Analysis Scoring						
Natural Hazard	Probability	Warning Time	Magnitude	Duration	CPRI	2022 Local Planning Significance
Weight Factor	0.45	0.15	0.3	0.1		
Earthquake	3.5	4	3	4	3.5	High
Wildland Interface Fire	3.5	4	3	2.5	3.3	High
Severe Weather/Storm	3.5	1	3	3	2.9	Moderate
Extreme Temperature	3	1	2	2.5	2.4	Moderate
Drought	2	1	3	4	2.2	Moderate
Tornado	2	4	2	1	2.2	Moderate
Flood	2.5	1	2	3	2.2	Moderate
Volcanic Eruption	2	1	2	3	2.0	Moderate
Landslide	1	1.5	1.5	2	1.3	Low
Avalanche	1	1	1	1	1.0	Low

Source: BOLD Planning Risk Assessment Method; Analysis by Marion County Emergency Management and City of Aurora staff on 11/16/21

Table 2-4, Hazard Vulnerability Assessment – Other Hazards

Hazard Profile Summary for the <u>City of Aurora</u> using BOLD Planning Analysis Scoring						
Non-Natural Hazard	Probability	Warning Time	Magnitude	Duration	CPRI	2022 Local Planning Significance
Weight Factor	0.45	0.15	0.3	0.1		
Hazardous Materials Release - Transportation	4	4	3	2	3.5	High
Chemical, Biological, Radiological, Nuclear, Explosive	2	4	4	4	3.1	High
Terrorism, Active Shooter, Workplace Violence	2	4	4	4	3.1	High
Hazardous Materials – Non- Transportation	3	4	2.5	2	2.9	Moderate
Fire - Residential / Commercial (Arson)	2	4	2	4	2.5	Moderate
Unauthorized Entry	2	4	2	4	2.5	Moderate
Public Health	2	1	2	4	2.1	Moderate
Cyberterrorism	1	4	2	3	2.0	Low
Agricultural Terrorism	1	1	3	4	1.9	Low

Source: Marion County Emergency Management and City of Aurora staff on 11/16/21.

2.9 Hazard Characteristics

Hazard History, Characteristics and Extent for Marion County apply also to City of Aurora. Volume I, Section 2, Risk Assessment, adequately describes the characteristics of natural hazards, as well as the location and extent of potential events. This section identifies vulnerabilities specific to City of Aurora, recent localized hazard events and impacts, and illustrates the basis for the city's HVA scores.

2.9.1 Avalanche

CPRI = 1.0, Risk Level: Low

Events: n/a

Vulnerability: n/a

2.9.2 Drought

CPRI = 2.2, Risk Level: Moderate

Events: According to the steering committee, Aurora has twice implemented their water curtailment ordinance, first in 2010 and then in 2014. Governor Kate Brown declared a drought emergency for all of Marion County in September 2015.

Vulnerability: The City's water supply comes primarily from subsurface sources, making vulnerability to drought moderate. Due to a cool, wet climate, past and present weather conditions have generally spared Marion County communities from the effects of drought.

Aurora has five wells that send water through a filtration system and into a reservoir, located on Ottaway Rd. Water from the reservoir is then pumped back to residential and commercial customers in Aurora.

2.9.3 Earthquake

CPRI = 3.5, Risk Level: High

Events: The 1993 Scott Mills quake caused \$28 million in damages to cities throughout Marion County. No damaging earthquake events occurred during the previous five years.

Vulnerability: The characteristics of both a crustal earthquake and a Cascadia Subduction Zone (CSZ) earthquake are similar to the county as a whole. This hazard was not rated as distinct CSZ and crustal events in the previous HMP. There are no locally active faults within the Aurora city limits. The nearest active fault runs northwest to southeast just outside of Canby, about five miles away from Aurora.

In 2017, the Aurora steering committee identified liquefaction as a primary concern related to the earthquake hazard. The committee indicated that many critical facilities and transportation routes might not withstand a high magnitude earthquake. In particular, the committee expressed concerns over City Hall, the two bridges in the north of town, and the North Marion High School. The committee identified mitigation efforts to address these vulnerabilities as "priority actions" in this plan.

2.9.4 Extreme Heat

CPRI = 2.4, Risk Level: Moderate

Events: Summer of 2021 had a set of heat waves in the Willamette Valley that affected Aurora in like kind to the rest of the valley.

Vulnerability: The Aurora RFPD hosted a cooling center in 2021. The city does not have the facilities to host a facility but coordinated to provide information about nearby alternatives.

2.9.5 Flood

CPRI = 2.2, Risk Level: Moderate

Events: Historically, Aurora experienced major floods in 1986, 1996, and in 2011 on the Pudding River. Since then, no major floods have affected the population, but Aurora continues to experience regular localized flooding during the wet season. According to the steering committee, properties along the Pudding River experience the most regular flooding. In these instances, structures are rarely affected. In the past, Mill Race Rd. (the gravel road leading to the Wastewater Treatment Plant) experienced flooding issues, but these issues have been resolved.

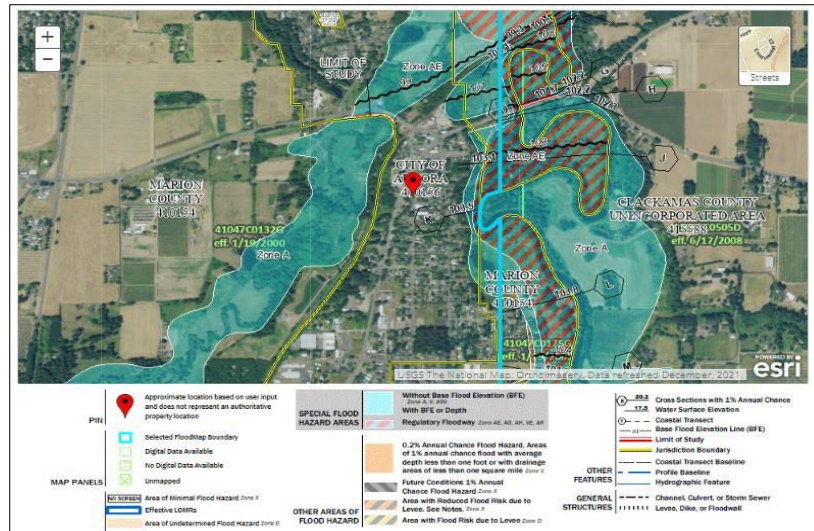
Vulnerability: Portions of Aurora have areas of floodplains (special flood hazard areas). These include areas along Mill Creek and the Pudding River (see Figure 2-3). According to the DOGAMI Risk Report for Marion County, portions of the communities of Aurora and Mehama are at risk to channel migration from the Pudding River.⁷

National Flood Insurance Program (NFIP)

The NFIP has two types of loss classifications, Repetitive Loss (RL) Property and Severe Repetitive Loss (SRL) Property. **RL**, property is any insurable building for which two or more claims of more than \$1,000 were paid by the National Flood Insurance Program (NFIP) within any rolling ten-year period, since 1978. A RL property may or may not be currently insured by the NFIP. **SRL**, property is a single family property (consisting of 1 to 4 residences) that is covered under flood insurance by the NFIP and has incurred flood-related damage for which 4 or more separate claims payments have been paid under flood insurance coverage, with the amount of each claim payment exceeding \$5,000 and with cumulative amount of such claims payments exceeding \$20,000; or for which at least 2 separate claims payments have been made with the cumulative amount of such claims exceeding the reported value of the property.

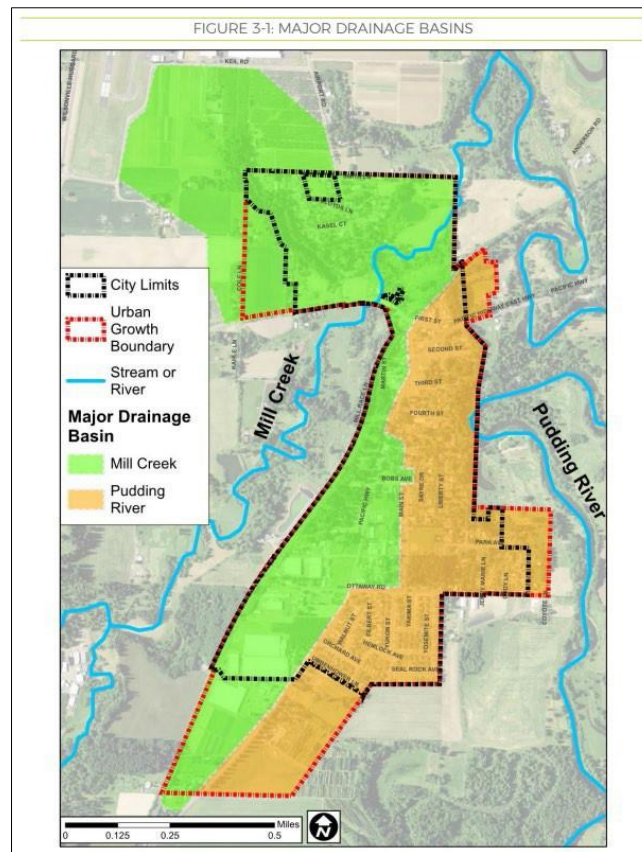
FEMA modernized the Aurora Flood Insurance Rate Maps (FIRMs) in January of 2000, and they became effective January 19, 2000. Aurora has not had any Community Assistance Visits (CAV) and is not a member of the Community Rating System (CRS). There have been no paid flood claims in Aurora.

Figure 2-2, Aurora Floodplain FIRM Map



Source: FEMA Map Service Center, <https://msc.fema.gov/>

Figure 2-3, Aurora Stormwater Basins



Source: Keller and Associates. (2021, June). City of Aurora Stormwater Master Plan.

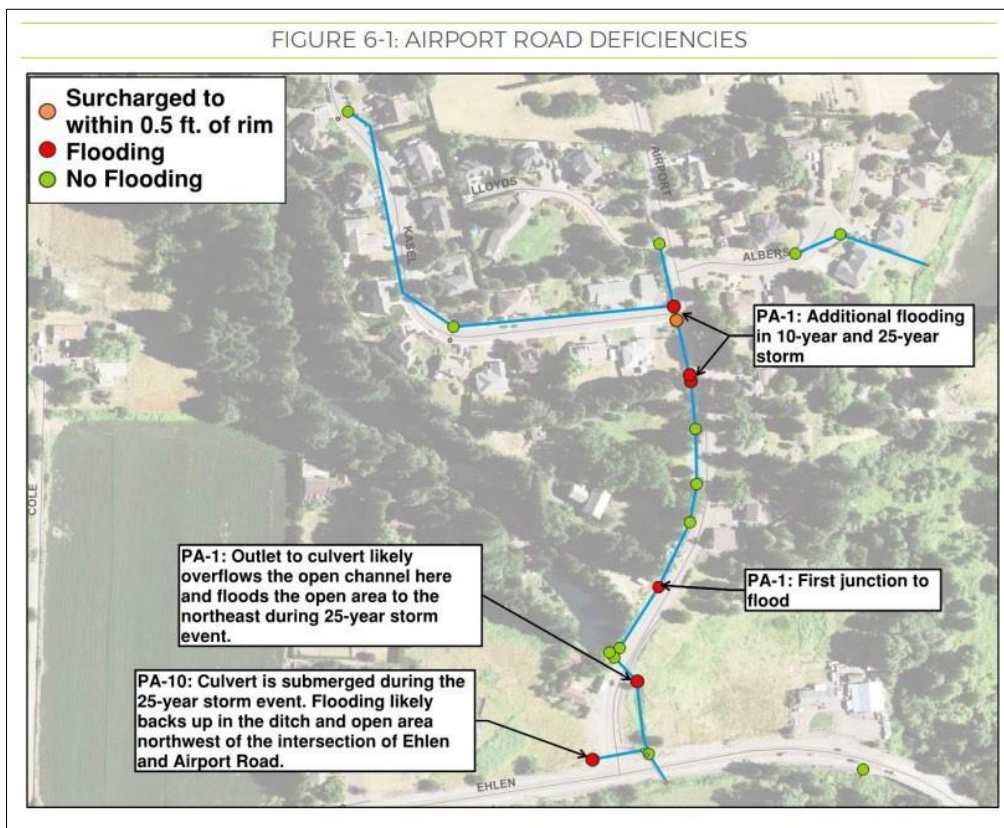
Table 2-5, Aurora Stormwater Deficiencies

TABLE 6-1: SUMMARY OF EXISTING STORMWATER DEFICIENCIES			
Problem Area ID	Location Description	First Storm Event with Surcharging ¹	First Storm Event with Flooding
PA-1	Airport Road Ditch	-	2-Year
PA-2	Main Street and 1st Street	-	10-Year
PA-3	2nd Street (Church Parking Lot)	10-Year	100-Year
PA-4	3rd Street and Main Street	-	2-Year
PA-5	Highway 99 North of 2nd Street	-	10-Year
PA-6	Main Street and Ottaway Road	-	2-Year
PA-7	Main Street North of Ottaway Road	2-Year	10-Year
PA-8	Cody Lane	-	2-Year
PA-9	Highway 99 and Ottaway Road	2-Year	10-Year
PA-10	Ehlen Road	-	25-Year
PA-11	Culvert under HWY 99 between Bobs and Ottaway	-	10-Year
PA-12	Liberty St.	-	25-Year
PA-13	Albers Way	25-Year	100-Year
PA-14	3rd Street Outfall	25-Year	100-Year
PA-15	Orchard Avenue	-	100-Year
PA-16	Kasel Court	-	100-Year

¹ Junctions are considered surcharged when the HGL is within 0.5 feet of the rim elevation

Source: Keller and Associates. (2021, June). City of Aurora Stormwater Master Plan

Figure 2-4, Airport Road Stormwater Deficiencies



Source: Keller and Associates. (2021, June). City of Aurora Stormwater Master Plan.

2.9.6 Landslide

CPRI = 1.0, Risk Level: Low

Events: Volume I, Section 2, Risk Assessment, adequately describes the causes and characteristics of landslides, and appropriately identifies previous landslide occurrences within the region.

Vulnerability: Aurora has a relatively flat topography. Landslide risk in Aurora is low to moderate in most populated areas, but moderate to high in other areas, particularly along Mill Creek and the Pudding River.

2.9.7 Severe Weather

CPRI = 2.9, Risk Level: Moderate

Events: In 2021, Aurora experienced a significant ice storm event that impacted travel, downed power lines, debris from downed trees was extensive and part of the declared countywide disaster. Power was out for 8 days.

Significant wind events occur in Aurora each year, sometimes interrupting services, downing trees, and causing power outages. More recently, windstorms in April 2010, May 2014, and July 2015 toppled trees in the Aurora Municipal Park, with one tree causing damage to a nearby house.

Major winter storms can and have occurred in the Aurora area, and while they typically do not cause significant damage, they are frequent and have the potential to impact economic activity. During a storm in April 2009, snow and ice caused City Hall to lose power for one day and debilitated the City's water tanks. During the winter of 2012-13, the steering committee reported that residents experienced power outages. These power outages also affected the pump stations used to transfer water to customers. The most recent winter storms (December 2016 – January 2017) included snow and ice and resulted in transportation and power interruptions combined with government office and school closures. A state of emergency was declared on January 11 and a Presidential Disaster was declared for the State of Oregon on January 25, 2017.

Vulnerability: Severe winter storms can consist of rain, freezing rain, ice, snow, cold temperatures, and wind. They originate from troughs of low pressure offshore that ride along the jet stream during fall, winter, and early spring months. Severe winter storms affecting Aurora typically originate in the Gulf of Alaska or in the central Pacific Ocean. These storms are most common from November through March.

2.9.8 Tornado

CPRI = 2.2, Risk Level: Moderate

Events: Significant wind events occur in Aurora each year, sometimes interrupting services, downing trees, and causing power outages. Since 1957, five reported tornadoes have struck Marion County – one of which occurred near Aurora on August 26, 1984. The tornado destroyed a machine shop and scattered its pieces over a half-mile area.

Vulnerability: The risk of a severe wind event is interrupted services, downed trees, and power outages.

2.9.9 Wildfire

CPRI = 3.3, Risk Level: High

Events: No history of wildfire events in Aurora.

Vulnerability: In 2017, the Aurora Steering Committee determined that the city was fairly isolated from wildfire risk. However, the steering committee identified the hillside above the Pudding River at the end of 4th St. as a potential issue. The committee also determined that should a wildfire occur nearby, the city could be affected by smoke, impacting people with respiratory problems, the elderly, and children.

In 2020, Aurora was impacted by wildfire smoke in the manner that the rest of the valley experienced. The City coordinates with Aurora RFPD on all wildfire issues.

2.9.10 Volcano

CPRI = 2.0, Risk Level: Moderate

Events: When Mt. Saint Helens erupted in 1980, the city was impacted only by falling ash.

Vulnerability: Aurora is very unlikely to experience anything more than volcanic ash during a volcanic event.

2.10 Mitigation Strategy

During the 2022 Marion County Hazard Mitigation Plan and City of Aurora Addendum update process, Oregon Department of Land Conservation & Development and City of Aurora developed a list of priority actions. These actions were prioritized and then reviewed internally by staff and city council during the spring and summer of 2022.

2.10.1 Ongoing Mitigation Actions

- Mid-Valley Council of Governments ensures compliance with the National Flood Insurance Program for the City of Aurora through the enforcement of local floodplain ordinances.
- Create and publicize alternative transportation routes in the event of road closures.
- The City of Aurora publicizes/educates residents about signing up for the Aurora Alerts email system; this has now expanded to include text and social media.
- Coordinate with Marion County on trainings; send employees to the ATC 20 training.
- Encourage reduction of nonstructural and structural earthquake hazards in homes, schools, businesses, and government offices through public education.
- Develop a multi-agency emergency response team for N. Marion County.
- Update the Water Conservation Plan
- Partner with Marion County to support agencies' determination of locations for additional aquifer studies that might lead to greater water supplies and help determine fundings sources for the studies.
- Encourage reduction of nonstructural and structural earthquake hazards in homes, schools, businesses, and government offices through public education
- Coordinate with PGE about undergrounding power lines that run along Grim (serving the School District).
- Perform fuel reduction projects.

2.10.2 Mitigation Success

- The city has approved a bond and is rebuilding City Hall to seismic standards. It will fund a new city hall, library, and emergency facility with an estimated 25–50-person capacity.
- The City of Aurora completed a Stormwater Master Plan in 2021 that identifies priority projects for mitigation. See action item #: 22-FL-01.
- The City of Aurora updated their code to require new developments to underground utilities.

2.10.3 City of Aurora Mitigation Action Tables

The following pages include the City's Priority Action Items (Table 2.6) and Action Item Status Report (Table 2.7)

Table 2-6, City of Aurora “Priority” Action Items

#	Hazard	Mitigation Action	Priority	Timeline	Cost	Description	Status
2022-FL-01	Flood	Address stormwater problem areas #1 & #10 – Airport Ditch Road and Ehlen Road	H	1-3 Years	\$250k	Problem Area (PA) #1: Outlet to culvert likely overflows the open channel here and floods the open area to the northeast during 25-year storm event. PA#2: Culvert is submerged during the 25- year storm event. Flooding likely backs up in the ditch and open area northwest of the intersection of Ehlen and Airport Road.	New
2022-MH-01	Multi-Hazard	Acquire emergency backup generators for all critical facilities (including City Hall and 2 wells).	H	2-5 Years	\$100k each		Started
2022-MH-02	Multi-Hazard	Develop mutual aid agreements and partner with private sector and local jurisdictions.	M	2-5 Years	Staff time	Fuel	Revised
2022-MH-03	Multi-Hazard	Work with the Northwest Oregon Chapter of the Red Cross to identify potential shelters. Create MOUs and partner with Red Cross to address this capability.	L	2-5 Years	Volunteer time	Aurora Emergency Preparedness is the City’s liaison with the Red Cross. The city endorses the efforts of Aurora Emergency Preparedness to raise disaster awareness.	Started

Source: Source: City of Aurora Addendum revision with staff and DLCD, June 15, 2022, and August 25, 2022

Table 2-7, City of Aurora Action Item Status Report

#	Hazard	Mitigation Action	Description	Coordinating Organization	Status
2017-P-1	Multi-Hazard	Create and publicize alternative transportation routes in the event of road closures.		City Planner	On-going
2017-P-2	Earthquake	Seek funding to further assess the “probability of collapse” for North Marion High School.	This is our partner’s mitigation action. NHSD could coordinate with MCEM.	N. Marion School District	Discontinue
2017-P-3	Earthquake	Work with the Salem Red Cross to identify potential shelters within the city. Create MOUs and partner with Red Cross to address this capability make it official.		City Administration	Not Started
2017-P-4	Windstorm	Identify backup power needs and acquire new backup generators (not propane) for the School District (which serves as the Emergency Shelter).	This is our partner’s mitigation action. NHSD could coordinate with MCEM.	N. Marion School District	Discontinue
2017-PW-5	Windstorm	Acquire emergency backup generators for all critical facilities (including City Hall and 2 wells). Do not purchase generators fueled by propane.		City Administration	Started
2017-MH-2	Multi-Hazard	Publicize and sign-up residents for the reverse 911 system.	Not a city project; Larger project to aggregate 911		Discontinue
2017-MH-3	Multi-Hazard	Publicize/educate residents about signing up for the Aurora Alerts email system; expand to include text and social media.		City Administration	Moved to 2022 ongoing
2017-MH-4	Multi-Hazard	Expand the emergency communication system to include text and social media	This is our partner’s mitigation action. NHSD could coordinate with MCEM.		Discontinue
2017-MH-5	Multi-Hazard	Build relationships with sister counties/jurisdictions/districts and create mutual aid agreements.	The City relies upon MCEM to coordinate this item.		Discontinue
2017-MH-6	Multi-Hazard	Partner with private sector and create mutual aid agreements.	The city partnered with local business during the 2021 Ice. storm		Discontinue
2017-MH-7	Multi-Hazard	Develop a multi-agency emergency response team for N. Marion County.	The City relies upon MCEM to coordinate this item.	City Administration	Moved to on-going
2017-DR-1	Drought	Update the Water Conservation Plan		Public Works	Moved to on-going

#	Hazard	Mitigation Action	Description	Coordinating Organization	Status
2017-DR-2	Drought	Partner with Marion County to support agencies' determination of locations for additional aquifer studies that might lead to greater water supplies and help determine fundings sources for the studies.		City Council	on-going
2017-EQ-1	Earthquake	Send employees to the County's ATC 20 training.		Public Works	on-going
2017-EQ-2	Earthquake	Encourage reduction of nonstructural and structural earthquake hazards in homes, schools, businesses, and government offices through public education.		City Administration	on-going
2017-EQ-3	Earthquake	Seek funding to further assess the 'probability of collapse' for Aurora City Hall.	The city has secured a bond and is rebuilding City Hall to seismic standards.	City Administration	Complete
2017-EQ-4	Earthquake	Continue to run earthquake drills		N. Marion School Dist.	On-going
2017-EQ-5	Earthquake	Encourage residents to prepare and maintain 2-week survival kits. Publicize through City newsletter, website, and the resilience and preparedness trainings the School District is creating.	City is creating and funding a nonprofit org to support community preparedness, . \$2k/yr.	City Administration	Started
2017-FL-1	Flood	Create a Stormwater Master Plan.	Completed plan in 2021	Public Works	Complete
2017-FL-2	Flood	Continue compliance with the National Flood Insurance Program through the enforcement of local floodplain ordinances.		Public Works	On-going
2017-FL-3	Flood	Identify strategies for mitigation and/or preventing flooding from impacting the city's wastewater lagoon system.	Completed Aurora Stormwater Master Plan in 2021.	Public Works	Complete
2017-FL-4	Flood	Work with property owners who regularly experience flooding along the Pudding River to mitigate their risks.	There are no properties that fit this description at this time.	Public Works	Discontinue
2017-SW-1	Severe Weather	Educate citizens about ways to weatherize their homes, as well as safe emergency heating equipment.	Aurora RFPD action item		Discontinue
2017-SW-2	Severe Weather	Support/encourage electrical utilities to use underground construction methods where possible to reduce power outages from windstorms.	Planning and building rules that require this.	Public Works	Ongoing
2017-SW-3	Severe Weather	Review code and revise to require new developments to underground utilities if requirement doesn't currently exist.	Mitigation success	City Administration	Complete
2017-SW-4	Severe Weather	Outreach to PGE about undergrounding power lines that run along Grim (serving the School District).		City Administration	Discontinue

#	Hazard	Mitigation Action	Description	Coordinating Organization	Status
2017-WF-1	Wildfire	Outreach to residents on the hillside at the end of 4th Street adjacent to Pudding River about performing fuel reduction projects.		City Administration with Aurora Fire Dist.	On-going
2017-WF-2	Wildfire	Check with the fireworks storage facility at the end of Ottaway to make sure they have a safety plan.		City Administration with Aurora Fire Dist.	On-going

Source: City of Aurora Addendum revision with staff and DLCD, June 15, 2022

3 City of Detroit Addendum

3.1 Purpose

This document serves as Detroit 's Addendum to the Marion County Multi-Jurisdictional Hazards Mitigation Plan (HMP). The purpose of this addendum is to guide the implementation of mitigation actions by the City of Detroit to improve the resilience of the community. Please note that mitigation planning is a long-term endeavor—one that requires broad internal involvement and community engagement to be successful. Finally, please refer to the information contained in Volume I (Basic Plan) and Volume III (Appendices) of this HMP, which provides additional information (particularly regarding participation and mitigation strategy) and forms the basis of this addendum.

3.2 Plan Process, Participation, and Adoption

In 2021 and early 2022, Marion County partnered with the Oregon Department of Land Conservation and Development (DLCD), the Oregon Department Emergency Management (OEM) and Marion County cities, including the City of Detroit, to update the August 2017 Marion County Multi-Jurisdictional Hazard Mitigation Plan (Marion County HMP), an update which includes the City of Detroit to update their addendum to the Marion County Hazard Mitigation Plan, which expired August 16, 2022.

By developing this addendum to the Marion County NHMP, locally adopting it, and having it approved by FEMA, the City of Detroit will gain eligibility for FEMA Hazard Mitigation Assistance funding that includes three programs: BRIC (Building Resilient Infrastructure and Communities), formerly the Pre-Disaster Mitigation grant program, Hazard Mitigation Grant Program (HMGP), and Flood Mitigation Assistance grant program funds. This project is funded through the Federal Emergency Management Agency's (FEMA) FY19 Pre-Disaster Mitigation Competitive Grant Program (PDMC-PL-10-OR-2019-003).

The City of Detroit joined the Marion County HMP update by executing an intergovernmental agreement with DLCD on September 21, 2021. On October 18, 2021, City of Detroit Mayor, Jim Trett, City of Detroit City Recorder Kelly Galbraith, Marion County Emergency Preparedness Coordinator Mike Hintz, and DLCD Planner Tricia Sears conducted a risk assessment meeting with the City of Detroit that included a Hazard Vulnerability Assessment ranking. City staff met again with DLCD on March 31, 2022, to update this addendum.

City of Detroit staff attended HMP Steering Committee meetings on October 5, 2021, November 21, 2021, January 4, 2022, March 1, 2022, and May 4, 2022. The city staff promoted the HMP outreach efforts throughout the plan update by posting the initial flyer provided by DLCD to the city's website throughout the update process.

3.3 Risk Assessment

A risk assessment is intended to provide the “factual basis for activities proposed in the strategy to reduce losses from identified hazards” (Department of Homeland Security, Federal Emergency Management Agency, 2023). This section of the HMP addendum can serve as the factual basis for addressing Oregon Statewide Planning Goal 7 – Areas Subject to Natural Hazards.

3.4 Community Profile

This section provides information on city specific assets and populations. For additional information on the characteristics of Jurisdiction, in terms of geography, environment, population, demographics, employment and economics, as well as housing and transportation see Volume III, Appendix C, Community Profile. Many of these community characteristics can affect how hazards impact communities and how communities choose to plan for hazard mitigation. Considering the city specific assets during the planning process can assist in identifying appropriate measures for hazard mitigation.

3.4.1 Community Characteristics

The City of Detroit is located approximately 50 miles east of Salem, bordering the Detroit Reservoir. It is the third largest community in the North Santiam River Canyon with a population in 2020 of 203 people in 45 households (U.S. Census, 2020). With an elevation of 1630 feet, the climate of Detroit is moderate; the average monthly temperatures range from 51 – 79 degrees in July and August, and 31-42 degrees in December and January. Detroit receives approximately 68 inches of rain and 10 inches of snow each year. The city’s topography is relatively flat but does possess sloped terrain adjacent to Detroit Reservoir. Outside of city limits, steep slopes surround the city on all sides.

Detroit benefits from its location along State Highway 22, a major east-to-west transportation route connecting Salem to Bend. It serves as a recreation hub with two marinas, restaurants, and lodging, for residents of the North Santiam Canyon and the traveling public along the State Highway 22 corridor. Historically, Detroit prospered from the development of the railroad and dam, which helped spur growth in manufacturing and logging. Today, the economy relies upon the recreational opportunities available through state/federal lands, and Detroit Lake.

3.5 Critical and Important Facilities

3.5.1 Transportation

Oregon State Highway 22 is the major transportation route for auto, public transit, and emergency vehicle access throughout the Santiam Canyon. State Highway 22 extends about 50 miles west, connecting Detroit to Salem and the remainder of the Willamette Valley. To the east, the highway connects to Idanha, and ends at the Santiam Pass interchange.

The Cherriots Canyon Connector is the only existing public transit service in the Santiam Canyon. This service runs four round trips on weekdays with buses running twice in the morning and twice in the afternoon. Detroit residents must drive to Gates to utilize these services, as the Canyon Connector does not reach Detroit or Idanha.

In case of a major State Highway 22 closure, Detroit residents will have to rely on alternate routes for supplies and to receive emergency medical services. The cities alternate routes are limited with NF-46, also known as Highway 46 Breitenbush Road and north of Detroit, French Creek Road. Depending on weather conditions, these roads may be unpassable. Alternatively, Life flight operates out of McNary Airport in Salem and can provide medivac if needed with a flight time of less than 10 minutes from Detroit.

Table 3-1, Bridges in the City of Detroit

Structure Name	Year Built	Structural Condition	Seismic Vulnerability
Tumble Creek; Bridge ID 07295	1949	Fair	Potentially vulnerable
Breitenbush River; Bridge ID 07017	1949	Fair	Potentially vulnerable

Source: 12021 Dashboards Interactive Bridge Report, Oregon Department of Transportation, consulted June 2022
Oregon Department of Transportation: Bridge Condition Report: Bridge: State of Oregon

Strengths:

- Proximity to ODOT facility may increase access to public works services.
- Docked boats along Detroit Lake can be utilized to transport residents to safety during concentrated hazard events (ex. hazardous materials, and wildfire).
- Fuels reduction measures have been taken along Weber Street to minimize risk to water system infrastructure.

Weaknesses:

- The loss of Breitenbush River bridge would isolate Detroit from the remainder of the Santiam Canyon and the Willamette Valley.
- Alternate routes are long, and most likely impassable in winter months.
- Hwy 22 closures could make travel outside of North Santiam Canyon extremely difficult.
- Public transportation options are limited and only reach to the City of Gates.
- The city’s drain and culvert infrastructure is old and getting to the point where some won’t flush a lot of water away anymore (street maintenance person keeps them in best shape and unclogs them when needed).

3.5.2 Dams

Two dams sit below Detroit, Detroit Dam and Big Cliff Dam. Previous steering committees have concluded that the likelihood of Dam Failure is Low. Current conditions still represent the previous decision. If Dam failure occurred in either dam, Detroit would most likely lose access to the western portion of Hwy 22.

3.5.3 Energy and Utilities

Detroit receives energy and utility services from Consumer Power Inc. There are no substations located in Detroit. One main power line runs along Hwy 22, connecting to Gates and Mill City.

Strengths:

- Gas stations with fuel storage exist within Detroit and possess both gasoline and diesel fuel.
- An electric car powering station and a Tesla electric car powering station exists within city limits; the capability to utilize this infrastructure is unknown.

Weaknesses:

- Gas stations possess below ground tanks which cannot be pumped without electricity.
- Gas stations do not currently possess backup diesel generators to pump fuel from storage tanks.
- No alternate sources of energy (wind, solar) exist to power basic services.
- Citizens rely on propane and there is limited access to propane during a disaster.

3.5.4 Water

The City of Detroit has two water sources which include Mackie Creek and the Breitenbush intake. Mackie Creek is Detroit's main water source in the winter months, located approximately 1/3 mile uphill from the water treatment plant. The Breitenbush intake, located approximately 1/3 mile up from Breitenbush Road, is utilized in the summer months.

Detroit's water treatment facility is located at the top of Gaymore, with a backup propane generator. The generator is accompanied by a 500-gallon propane storage tank and can power water facilities for approximately one week.

Detroit has two treated water storage tanks equaling 440,000 gallons (200,000 and 240,000). The city also has one un-treated water storage tank which holds 35,000 gallons. The water level in this tank is maintained from the Breitenbush intake and is gravity fed from the treatment plant.

Strengths:

- Two (2) water intake sources (Mackie & Breitenbush).
- One (1) backup propane generator on-site.
- Two (2) above-ground storage tanks located near water treatment facility. This is equivalent to 440,000 gallons or 3-4 days of water storage in summer months or 4-8 days in winter months.

Weaknesses:

- The current backup generator runs on propane.
- Water intake sources are susceptible to wildfire damage.
- The city is losing approximately 40% of water distributed through leaky pipes. Roughly 40% of the water travelling through the water pipes is lost due to deficient infrastructure.
- Water usage estimates are 60,000 gallons in the winter and 120,000 gallons in the summer.

3.5.5 Wastewater

Detroit does not have any municipal waste-water infrastructure. The city’s residents and business owners rely on individual septic tanks. These septic tanks can be up to 60-years old and could be leaching hazardous material into the ground water/ Detroit Reservoir.

3.5.6 Emergency Services

Detroit receives emergency service support from Marion County Sheriff’s Office and the Idanha- Detroit Rural Fire Protection District. Both are located at 160 Detroit Avenue, Detroit, OR.

Strengths:

- Detroit possesses emergency services for fire and law enforcement.
- An emergency propane generator with 70-gallons of storage exists inside City Hall; utilized by both fire and law enforcement.

Weaknesses:

- Fire and law enforcement rely on City Hall facilities to operate.
- Ambulance services must travel from the City of Lyons.
- First responders are very limited to basic life monitoring services.
- Currently, emergency services do not have trained HAM radio operators.

3.5.7 Environmental / Historical Preservation Sites

Detroit is surrounded by environmental preservation sites including federal land, state parks and designated wilderness areas. The housing stock in Detroit was built after the 1950s and does not contain any sites of historical significance. The city does possess the Detroit Ranger Station, Detroit State Park, and Detroit Lake, which help to bring in a high volume of recreational tourism in the summer months.

Strengths:

- Proximity to pristine state and federal land could attract residents or business.
- Some remnants remain of the old Detroit location (now at the bottom of Detroit Lake)

Weaknesses:

- Detroit lacks buildings with historical “timber”.

3.5.8 Communication / Information Technology

There is currently one communication provider in Detroit. Zippy Fiber, formerly Frontier, provides phone service, and broadband internet with limited fiber infrastructure adjacent to Hwy 22.

Strengths:

- Limited fiber internet infrastructure already presents along Hwy 22.
- Cellular Tower (AT&T/Verizon) east of Detroit, past the ranger station, with diesel generator backup.
- AT&T cellular tower at entrance of town.
- Public Works possesses low range walk-talkie access (>1/2) mile.

Weaknesses:

- Limited communication access including internet and phone.
- Currently no known HAM radio operators in the community.
- Main communication line runs down Hwy 22 and is susceptible to downed trees and wind.
- Phone lines are both buried and overhead, which could prove difficult for maintenance.

3.5.9 Agriculture and Food

Although Detroit is home to the Detroit Market and Mountain High Grocery the closest large- scale grocery is in Stayton approximately 37 miles east on State Highway 22. While other restaurants and lounges are located on Detroit’s Main Street, the loss of State Highway 22 as a transportation route would cause serious concern for residents and food accessibility. The city is surrounded by steep slopes that are state and federal land. There is no agricultural capability other than small-scale “urban” farms within city limits.

Strengths:

- Private sector entities possess limited (1-2 days) food supplies.

Weaknesses:

- No major, full-service grocery store inside of city limits.
- Surrounding land not suitable for agricultural purposes.

3.5.10 Banking and Finance

Detroit's nearest option for banking services is in Mill City. This one-story structure sits along Hwy 22 and could be utilized for emergency financial services during a hazard event. Detroit does not have any financial services within city-limits.

Strengths:

- Cash flow from nearby businesses could possibly be utilized.

Weaknesses:

- Lack of banking/financing institutions within city limits.
- Full "urban" financial services unavailable.

3.5.11 Hazardous Materials

The city resident's reliance on propane as a backup fuel source can be hazardous in certain conditions. These above ground propane tanks can be susceptible to leaking after an earthquake or to explosion during a wildfire.

The City of Detroit does not contain any large manufacturing firms that possess hazardous materials. By consulting the Department of Environmental Quality Environmental Cleanup Site Information (ECSI) database this plan has identified one brownfield, defined as a vacant or underused property where actual or perceived environmental contamination complicates its expansion or reuse. The former Detroit Elementary School heating oil tank brownfields currently require no further action. Remediation was completed in 2011.

Strengths:

- There are currently not enough known hazardous materials to cause major concern.
- Brownfield site could be utilized and attract private sector development.

Weaknesses:

- Propane tanks within city limits can be extremely hazardous.

3.5.12 Government Facilities

Detroit is in the process of constructing a new facility for City Hall located at 345 Santiam Avenue West. City Hall and the offices of the Fire Department were destroyed during the September 2020 wildfires. The facility will contain office space for all city services as well as the headquarters for the Detroit Fire District and space for Marion County Sheriff's Office staff. The city has a generator that assures continuance of city business, and provides power to the meeting hall (emergency center). This includes outlets for electric heaters and lights only.

- Detroit City Hall, 345 Santiam Avenue West
- Post Office, 170 Detroit Ave

Strengths:

- The new City Hall facility will have a kitchen, six (6) bathrooms, and one (1) emergency generator with two (2) 25-gallon propane storage tanks that work in unison.

Weaknesses:

- Propane fuel maybe limited and could only power City Hall for a couple of days.

3.5.13 Education

The City of Detroit is part of the Santiam Canyon School District. This district encompasses all cities in the Santiam Canyon including Mill City, Gates, and Idanha. All the district's school facilities are in Mill City.

Strengths:

- School facilities could be utilized to shelter a large amount of community residents including Access and Functional Needs populations.
- School facilities possess needed infrastructure for a shelter which includes restrooms, showers, and a kitchen.
- School buses could be utilized for transportation after an emergency or disaster.

Weaknesses:

- Detroit is over 20 miles from school services.
- There are no current agreements or Memoranda of Understanding (MOU's) between the City and School District to utilize facilities after an emergency or disaster.

3.5.14 Healthcare and Public Health

Detroit's nearest medical services are in Mill City which contains one clinic with limited services. The nearest hospital and full-service health clinic are located in Stayton, Oregon. Emergency Medical Services (EMS) are in the City of Lyons.

Strengths:

- A clinic with minor services is located within the north Santiam canyon.

Weaknesses:

- Closest health services are located over 20 miles.
- No facilities with major life-saving equipment are currently located within city limits.
- Emergency health supplies are limited to what exists within the community.

3.5.15 Access and Functional Needs

Detroit’s vulnerable population consists of the elderly and those that may have mobility issues. About 7% of Detroit’s population is 75 or older, and over 6.9% of full-time residents are living below the poverty line (U.S. Census, 2020). The city is quickly turning into a 2nd home community, increasing the actual population to 1000+ (210 full-time, 790+ part-time).

Strengths:

- Over 65% of full-time residents are over the age of 45, this older population can volunteer and promote social cohesion in the community.

Weaknesses:

- No medical services exist for the aging population.

3.6 Plans and Polies

Table 3-2, Plans and Policies of the City of Detroit

Document Name	Year
City of Detroit Charter	2012
Detroit, Oregon Community Wildfire Protection Plan	2017
Former Elementary Site Park Plan	2013
Wastewater Feasibility Study	2014
Comprehensive Plan	Adopted in 1979, most recent 2009
Transportation System Plan	
North Santiam Watershed Drought Contingency Plan	2018
Mid-Willamette Valley Council of Governments Comprehensive Economic Development Strategy	2018

3.7 Hazard Profile

Table 3-3, City of Detroit hazard profile

Community Overview							
Community Name	Population	# Of Buildings		Critical Facilities ¹	Total Building Value (\$)		
Detroit	205	315		1	69,925,000		
Hazus-MH Analysis Summary							
Hazard	Scenario	Potentially Displaced Residents	% Potentially Displaced Residents	Damaged Buildings	Damaged Critical Facilities	Lost Estimate (\$)	Loss Ratio
Flood ²	1% Annual Chance	0	0%	0	0	0	0%
Earthquake	Mt. Angel Mw 6.8 Deterministic	0	0%	2	0	186,986	0.3%
Exposure Analysis Summary							
Hazard	Scenario	Potentially Displaced Residents	% Potentially Displaced Residents	Exposed Buildings	Exposed Critical Facilities	Building Value (\$)	Exposure Ratio
Landslide	High and Very High Susceptibility	52	26%	78	0	18,032,000	26%
Channel Migration	Channel Migration Zone	0	0%	0	0	0	0%
Wildfire	High and Moderate Risk	120	59%	185	0	36,915,258	53%
Lahar	Medium Zone (1000 to 15000 – Year)	128	62%	198	0	47,132,000	67%
¹ Facilities with multiple buildings were consolidated into one building complex. ² No damage is estimated for exposed structures with “First floor height” above the level of flooding (base flood elevation).							
Critical Facilities							
Critical Facilities by Community	Flood 1% Annual Chance	Earthquake Moderate to Complete Damage	Landslide High and Very High Susceptibility	Channel Migration Zone	Wildfire High or Moderate Risk	Lahar Hazard	
None Reported							

Source: DOGAMI (2022)

¹Facilities with multiple buildings were consolidated into one building complex.

²No damage is estimated for exposed structures with “First floor height” above the level of flooding (base flood elevation).

3.8 Hazard Analysis

The methodology for assessing risk was the same for all jurisdictions and a detailed description of the BOLD planning methodology can be found in Volume I, a brief description is below. To complete the risk assessment, the jurisdiction representatives first updated the description, type, location, and extent of each hazard. Next, they updated the Hazard Vulnerability Analysis based on each hazard’s potential impact on the community using a calculated priority risk index (CPRI) methodology developed by BOLD Planning. This assessment method ranks the following factors to determine risk from the range of natural hazards identified:

1. Probability (frequency) of event,
2. Magnitude of event,
3. Expected warning time before event, and
4. Expected duration of event.

Score	Probability	Warning Time	Magnitude/Severity	Duration
4	Highly Likely	Less than 6 hours	Catastrophic	More than 1 week
3	Likely	6-12 hours	Critical	Less than 1 week
2	Possible	12-24 hours	Limited	Less than 1 day
1	Unlikely	24+ hours	Negligible	Less than 6 hours

The assessment identifies three levels of risk: High, Moderate and Low.

High - High probability of occurrence; at least 50 percent or more of population at risk from hazard; significant to catastrophic physical impacts to buildings and infrastructure; major loss or potential loss of functionality to all essential facilities (hospital, police, fire, EOC and shelters).

Moderate - Less than 50 percent of population at risk from hazard; moderate physical impacts to buildings and infrastructure; moderate potential for loss of functionality to essential facilities.

Low - Low probability of occurrence or low threat to population; minor physical impacts.

IMPACT	Range Values	
	Low CPRI	High CPRI
High	3.0	4.0
Moderate	2.0	2.9
Low	1.0	1.9

A summary of the risk assessment findings and rankings is presented below.

Table 3-4, City of Detroit Hazard Vulnerability Assessment – Natural Hazards

Hazard Profile Summary for the City of Detroit using BOLD Planning Analysis Scoring						
Natural Hazard	Probability	Warning Time	Magnitude	Duration	CPRI	2022 Local Planning Significance
Weight Factor	0.45	0.15	0.3	0.1		
Wildland Interface Fire	4	4	4	4	4.0	High
Earthquake	4	4	3	4	3.7	High
Landslide	4	2.5	2.5	3	3.2	High
Severe Weather/Storm	4	1	2	3	2.9	Moderate
Drought	3	1	2.5	4	2.7	Moderate
Extreme Weather - High Temperature	3	1	1	3	2.1	Moderate
Avalanche*	2	2	2	3	2.1	Moderate
Volcanic Eruption	2	1	2	4	2.1	Moderate
Flood**	2	1	2	3	2.0	Moderate
Tornado***	1	4	1	4	1.8	Low

Source BOLD Planning Risk Assessment Method: Analysis by the City of Detroit representatives to the NHMP update on 10/18/2021.

Table 3-5, City of Detroit Hazard Vulnerability Assessment – Other Hazards

Hazard Profile Summary for the <i>City of Detroit</i> using BOLD Planning Analysis Scoring						
Non-Natural Hazard	Probability	Warning Time	Magnitude	Duration	CPRI	2022 Local Planning Significance
Weight Factor	0.45	0.15	0.3	0.1		
Cyberterrorism	3.5	4	4	4	3.8	High
Hazardous Materials - Transportation	4	4	3	3	3.6	High
Public Health	4	4	3	3	3.6	High
Chemical, Biological, Radiological, Nuclear, Explosive	2	4	2	4	2.5	Moderate
Fire - Residential / Commercial (Arson)	2	4	2	4	2.5	Moderate
Unauthorized Entry	2	4	2	4	2.5	Moderate
Terrorism/Active Shooter/Workplace Violence	2	4	2	3	2.4	Moderate
Agricultural Terrorism	2	1	2	4	2.1	Moderate
Hazardous Materials - Non-Transportation	1	4	2	3	2.0	Low

Source Hazard Profile Summary for the City of Detroit using BOLD Planning Analysis Scoring

3.9 Hazard Characteristics

Hazard History, Characteristics and Extent for Marion County apply also to the City of Detroit. Volume I, Section 2, Risk Assessment, adequately describes the characteristics of natural hazards, as well as the location and extent of potential events. This section identifies vulnerabilities specific to the City of Detroit recent localized hazard events and impacts and illustrates the basis for the city’s HVA scores.

3.9.1 Avalanche

CPRI = 2.1, Risk Level: Moderate

Events: None during the effective period of the prior plan.

Vulnerability: None.

3.9.2 Drought

CPRI=2.7 Risk Level: Moderate

Events: During the effective period of the Marion County Multi-Jurisdictional NHMP, the City of Detroit did experience significant drought events during the effective period of the plan. However, the level of Detroit Lake dipped to its lowest level in the summer of 2020.

Figure 3-1, Detroit Lake levels 2016-2021



Source: [USGS Current Conditions for USGS 14180500 DETROIT LAKE NEAR DETROIT, OR](#)

3.9.3 Earthquake

CPRI = 3.7 Risk Level: High

Events: During the effective period of the prior NHMP a magnitude 2.8 earthquake occurred 6.8 miles (11 km) NNW of the City of Detroit on August 30, 2018, at a depth of 3.8 km. Detroit also experienced a crustal earthquake on August 19, 1961. A 4.5 magnitude earthquake struck 6 miles from Mill City, with shaking felt throughout the Santiam Canyon, up to Detroit.

Vulnerability: If another larger and more substantial earthquake occurs (Cascadia), Detroit could experience damage to buildings, utility (electric power, communication, water, wastewater, natural gas) and transportation systems (ex. bridges, and pipelines).

3.9.4 Extreme Heat

CPRI = 0, Risk Level: Low

Events:

Vulnerability: The Community Center will soon be operational as a cooling center.

3.9.5 Flood

CPRI = 2.0, Risk Level: Moderate

Events: Detroit experienced a major flooding event in 2006. Heavy rains and high winds caused damage in the Detroit, Idanha, and Breitenbush area.

Vulnerabilities: Impacts of flooding on the community included roofing damage, flooding of public facilities, sinkholes, erosion, and impacts to availability of drinking water. The water facility intake experienced clogging due to turbidity.

3.9.6 Landslides

CPRI = 3.2 Risk Level: High

Events: Historically, Detroit has not experienced major impacts from landslides within city limits. A rockslide blocked Hwy 22 during the effective period of the prior plan (2012-2017) that involved the Detroit Fire District to assist in removing debris. Areas in the east and northern portion of the city are susceptible because of steep mountains terrain. The western portion and reminder that border Detroit Lake are also at higher risk.

Vulnerability: Potential landslide-related impacts include infrastructure damages, economic impacts (due to isolation and/or arterial road closures), property damages, and obstruction to evaluation routes. Rain-induced landslides and debris flows can potentially occur during any winter in Marion County; throughfares beyond city limits are susceptible to obstruction as well.

3.9.7 Volcanic Eruption

CPRI = 2.1, Risk Level: Moderate

Events: Detroit has not been impacted previously by volcanic activity; however, Mount Jefferson is located east of the city into the Cascade Mountains and could produce lahars or ash if an eruption occurs.

Vulnerability: The city sits in the Mount Jefferson Moderate Hazard Zone and could experience ash fall, debris avalanches, pyroclastic flows, lahars, and slow-moving lava flows. City residents should be evacuated before an eruption begins in case of impassible roads and dangerous conditions.

3.9.8 Wildfire

CPRI = 4.0 Risk Level: High

Events: September 2020 Beachie Creek and Lionshead fires.

Vulnerability: The economy of the city was devastated by the 2020 Labor Day fires. The fires have left many dead and dying trees that will not be removed and will continue to be a source of wildfire hazard.

Marion County updated the Community Wildfire Protection Plan (CWPP) in 2016 and the City of Detroit prepared its own Wildfire Protection Plan in 2017. These plans mapped wildland urban interface (WUI) areas and developed actions to mitigate wildfire risk. The city is a participant in the county CWPP both of which identify hazard mitigation action items intended to reduce risk from wildfire hazard.

3.9.9 Severe Weather / Storms

CPRI = 2.9, Risk Level: Moderate

Severe Weather/ Storms encompasses both windstorms and severe winter storms that may bring snow and ice.

Events: About once or twice per year the city will experience a windstorm event that can interrupt services, down trees, and cause power outages. Typically, windstorms occur during winter months, they are sometimes accompanied by ice, freezing rain, flooding, and very rarely, snow.

An ice storm occurred in February 2021 that resulted in downed trees and some damage to homes, as well as power outages. The water plant continued to operate well during the storm.

Vulnerability: Winter storms are among the more frequent natural hazard events in Detroit and usually cause transportation issues and communication failures from downed trees and icy/snow filled roads. The ability to respond to these hazards quickly and effectively determines the potential impacts these regular occurrences will have in the community.

3.9.10 Tornado

CPRI = 1.8, Risk Level: Low

Events: None during the effective period of the prior plan.

Vulnerability: The location of the city at the head of Detroit Lake may allow winds to develop over the lake.

3.10 Mitigation Strategy

During the 2022 Marion County Hazard Mitigation Plan and Jurisdiction Addendum update process, Oregon Department of Land Conservation & Development and Jurisdiction developed a list of priority actions. These actions were prioritized and then reviewed internally by staff and city council during the spring of 2022.

Detroit developed a list of priority actions (Table 3.7), any actions that were not prioritized were placed in the Action Item Pool (Table 3.8) and will be considered during the semi-annual meetings.

3.10.1 Priority Actions

The city is listing a set of high priority actions to focus attention on an achievable set of high leverage activities over the next five years. The city's priority actions are listed below in the Priority Action Item table (Table 3.6)

3.10.2 Action Item Status Report

The city is carrying out several mitigation actions on an ongoing basis. These actions are identified in in the Action Item Status Report (Table 3.7)

3.10.3 Action Item Pool

This expanded list of actions is available for local consideration as resources, capacity, technical expertise and/or political will become available.

Many actions carry forward from prior versions of the Marion County NHMP and other local planning documents including the Community Wildfire Protection Plan, Drought Contingency Plan, and Mid-Willamette Economic Development study. They are grouped into Short Term and Long-Term action items.

3.10.4 City of Detroit Mitigation Action Tables

The following pages include the city's Priority Action Items (Table 3.6) and Action Item Status Report (Table 3.7).

Table 3-6, City of Detroit “Priority “Action Items

#	Hazard	Mitigation Action	Priority	Timeline	Cost	Description	Status
2022-MH-01	Multi-Hazard	Update planning documents (comprehensive plan, development code) to reflect new hazard information.	High	1-3 years	Staff time	The city is in the process of updating the development code. The 2020 wildfires expedited the need to update the code. The Mid-Willamette Valley Council of Governments (MWCOG) is assisting to address how the city wants to redevelop. Updating the Comprehensive Plan is progressing more slowly because there is so much else to do in issuing building permits as recovery happens.	Progressing
2022-MH-02	Multi-Hazard	City staff should assess the amount of KWH needed to run city facilities. City staff should purchase propane storage accordingly to run their generator.	High	1-3 years	Cost is being born by Detroit Lake Foundation ; General Fund, MWVCOG grants/loan s	A new, larger facility is being built for the Detroit Lake Foundation and then the developers will gift it to the city. The assessment of the KWH needed to run city facilities is being done as part of this project.	Progressing
2022-MH-03	Multi-Hazard	Create a reservoir to allow the back flush water from the city’s membrane system to infiltrate slowly;	High	Timeline will be established when funding source is identified	Funding source needs to be identified	The city water system utilizes a membrane to filter water. This membrane needs to be back flushed to maintain the viability of the membranes. The city is in the process of identifying suitable locations for the reservoir. A potential location may be in Spotted Owl habitat that could impede its development.	New

Table 3-7, City of Detroit Action Item Status Report

#	Hazard	Mitigation Action	Description	Coordinating Organization	Status
2017-EQ-1	Earthquake	Promote Great Oregon Shakeout Awareness month in October. Participate in activities for schools, business, and industry. Participating with the Mid-Willamette Emergency Communications Collective on initiatives that are focused on household preparedness.		City of Detroit	On-going
2017-EQ-2	Earthquake	Collaborate with GROW EDC to develop relevant public-private partnerships with businesses that can contribute to response and recovery. (Multi-Hazard 4)	Remove, GROW EDC no long exits.	City of Detroit	Discontinue
2017-MH-1	Multi-Hazard	Develop an Energy Assurance Plan. The city has identified that the commercial “card lock” fuel station is the source of gasoline and there will be a propane tank located at the new Community Center that will be filled by company in the valley		City of Detroit	On-going
2017-MH-2	Multi-Hazard	Incentivize and assist local fueling stations to purchase diesel generators capable of pumping fuel from in-ground storage tanks.	Remove, this action no longer makes sense as only one fuel company remains after the fires	City of Detroit	Discontinue
2017-MH-3	Multi-Hazard	Assess the short and long term needs for sheltering access and functional needs populations for all hazards. This action will be completed when the Community Center is complete. It will serve as a shelter and will be ADA compliant. Cots and other materials will be added to support the use of the facility as a shelter.		City of Detroit	On-going
2017-MH-4	Multi-Hazard	Develop a MOU with community fuel stations to utilize fuel resources found in below-ground tanks after a hazard event.		City of Detroit	On-going
2017-MH-5	Multi-Hazard	Join Marion County CERT Team	Marion County does not host CERT teams	City of Detroit	Discontinue
2017-MH-6	Multi-Hazard	Develop a community education program – such as an all-hazard community outreach forum for students and residents. *	Remove because the 2020 Wildfires saw the city doing emergency response on their own w/o any special training.	City of Detroit	Discontinue

*Identified in Marion County Community Wildfire Protection Plan (Action Plan & Priorities)

**Identified in North Santiam Watershed Drought Contingency Plan (Priority Drought Mitigation Actions)

***Identified in Mid-Willamette Valley Council of Governments Comprehensive Economic Development Study (Appendix C)

#	Hazard	Mitigation Action	Description	Coordinating Organization	Status
2017-MH-7	Multi-Hazard	Expand auxiliary radio capabilities by developing a team of HAM Radio operators for EMS and interested public.		City of Detroit	On-going
2017-DR-1	Drought	Monitor economic impacts on recreation, tourism, and agriculture communities.	Long-term	City of Detroit	On-going
2017-DR-2	Drought	Collaborate with NSWC to complete WMCP's and improve community understanding of water usage and opportunities to increase efficiencies. **	Long-term	City of Detroit	On-going
2017-DR-3	Drought	Collaborate with Detroit Lake Recreation Area Business Association (DLRABA) to create a Detroit Lake Master Recreation Plan focused on economic drought resiliency. **	Long-term	City of Detroit	On-going
2017-DR-4	Drought	Collaborate with local Marina's and DLRABA to excavate marinas and allow for use at low water levels. **	Long-term	City of Detroit	On-going
2017-DR-5	Drought	Collaborate with Detroit Ranger Station to extend boat ramps that are usable year-round. **	Long-term	City of Detroit	On-going
2017-DR-6	Drought	Conduct leak detection surveys for the water system to increase efficiency and prevent further water loss. **	Long-term	City of Detroit	On-going
2017-MH-8	Multi-Hazard	Designate evacuation routes outside of Hwy 22 for EMS.	Long-term	City of Detroit	On-going
2017-MH-9	Multi-Hazard	Collaborate with Marion County to connect to a more resilient regional water/sewer system. ***	Long-term	City of Detroit	On-going
2017-MH-10	Multi-Hazard	Gather community support for the installation of resilient fiber communication infrastructure throughout the community. ***	Long-term	City of Detroit	On-going
2017-WF-1	Wildfire	Collaborate with Detroit Ranger District, ODF, and BLM to conduct fuel hazard reduction along the Wildland Urban interface and Hwy 22. *	Long-term	City of Detroit	On-going
2017-WF-2	Wildfire	Collaborate with ODF and Detroit RFD to develop strategic community fuel breaks. *	Long-term	City of Detroit	On-going
2017-WF-3	Wildfire	Collaborate with ODF and Idanha- Detroit RFD on the North Santiam River acres project to develop defensible space. *	Long-term	City of Detroit	On-going

#	Hazard	Mitigation Action	Description	Coordinating Organization	Status
2017-LS-1	Landslide	Integrate new DOGAMI landslide hazard information into land use zoning/development codes.	Long-term	City of Detroit	On-going
2017-FL-1	Flood	Collaborate with Marion County to survey and assess current culvert infrastructure most susceptible to natural hazards	Long-term	City of Detroit	On-going

Source: City of Detroit, 2022

4 City of Gervais Addendum

4.1 Purpose

This document serves as the City of Gervais’s Addendum to the Marion County Multi-Jurisdictional Hazards Mitigation Plan (MHMP, HMP). The purpose of this addendum is to guide the implementation of mitigation actions by Gervais to improve the resilience of the community. Please note that mitigation planning is a long-term endeavor—one that requires broad internal involvement and community engagement to be successful. Finally, please refer to the information contained in Volume I (Basic Plan) and Volume III (Appendices) of this HMP, which provides additional information (particularly regarding participation and mitigation strategy) and forms the basis of this addendum.

4.2 Plan Process, Participation, and Adoption

For the 2022 Hazard Mitigation Plan update, Marion County partnered with the Oregon Department of Land Conservation and Development to secure FEMA grant funding to support the multi-jurisdictional plan update. This effort included the City of Gervais and created the city’s first addendum to the Marion County Hazard Mitigation Plan, as a new plan holder jurisdiction.

By developing this addendum to the Marion County HMP, locally adopting it, and having it approved by FEMA, the City of Gervais will gain eligibility for FEMA Hazard Mitigation Assistance (HMA) funding that includes three programs: Building Resilient Infrastructure & Communities (BRIC), formerly the Pre-Disaster Mitigation grant program, the Hazard Mitigation Grant Program (HMGP), and the Flood Mitigation Assistance (FMA) program. This project is funded through the Federal Emergency Management Agency’s (FEMA) FY19 Pre- Disaster Mitigation Competitive Grant Program (PDMC-PL-10-OR-2019-003).

The City of Gervais joined the Marion County HMP update by executing an intergovernmental agreement with DLCD in December 2021. On January 10, 2022, City of Gervais Susie Marston (City Manager), Mark Chase, City Police Chief, Marion County Emergency Preparedness Coordinator Mike Hintz, and DLCD Planner Pam Reber conducted a risk assessment meeting with the city that included a Hazard Vulnerability Assessment ranking. City staff met again with DLCD on March 14, 2022, to update this addendum.

The City of Gervais City Manager attended HMP Steering Committee meetings on 1/4/22, 3/1/22, 5/4/22, and 6/7/22. Gervais staff promoted the HMP survey and outreach efforts throughout the plan update, including public posts on the city’s website and Facebook page in January 2022 to distribute the plan update public survey to interested parties in the Gervais service area.

4.3 Risk Assessment

A risk assessment is intended to provide the “factual basis for activities proposed in the strategy to reduce losses from identified hazards” (Department of Homeland Security, Federal Emergency Management Agency, 2023). This section of the HMP addendum can serve as the factual basis for addressing Oregon Statewide Planning Goal 7 – Areas Subject to Natural Hazards.

4.4 Community Profile

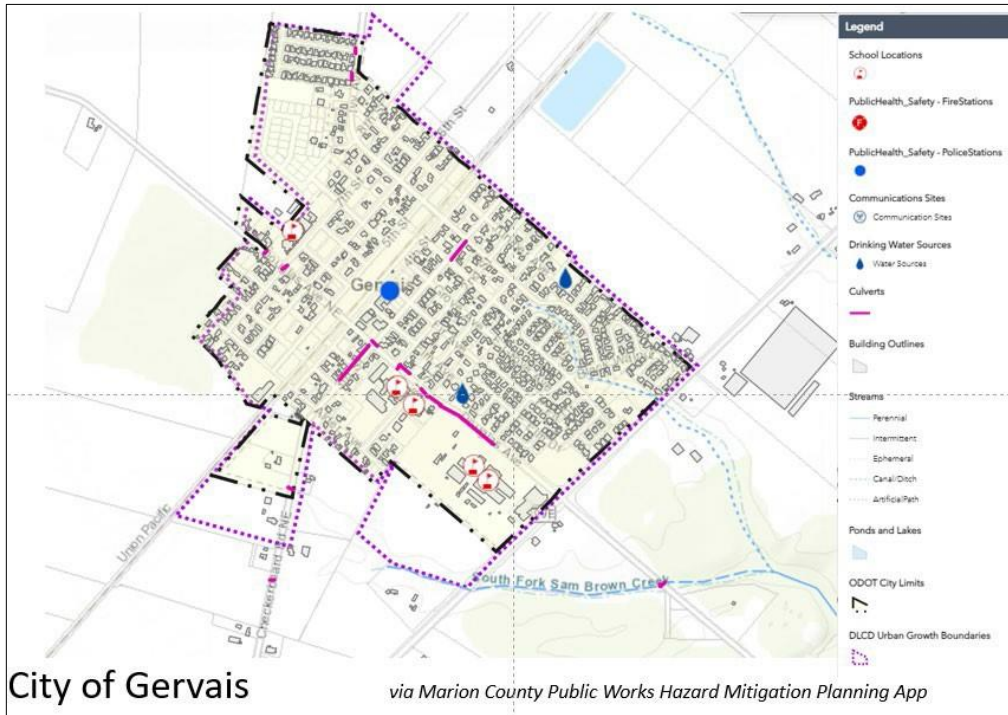
This section provides information on city specific assets and populations. For additional information on the characteristics of the City of Gervais, in terms of geography, environment, population, demographics, employment and economics, as well as housing and transportation see Volume III, Appendix B, Community Profile. Many of these community characteristics can affect how hazards impact communities and how communities choose to plan for hazard mitigation. Considering the city-specific assets during the planning process can assist in identifying appropriate measures for hazard mitigation.

4.4.1 Community Characteristics

The City of Gervais is in Marion County, 2 miles south of the City of Woodburn and 16 miles north of the City of Salem along Highway 99E. Gervais is in the central Willamette Valley, primarily surrounded by agricultural land, with elevations from 175 to 185 feet above sea level. The terrain within the UGB is relatively impervious and level resulting in slow runoff and ponding during storm events. The city and surrounding agricultural lands drain into Sam Brown Creek and the northern tributary of the Pudding River. The Pudding River is a tributary to the Molalla River, which is a tributary to the Willamette River. These soils are characterized by a high-water table, moderate or slow permeability and low shear strength for building foundations (City of Gervais, 2019).

The Population Research Center at Portland State University lists the City of Gervais’s 2020 population at 2,624. This represents a 26.3% increase from 2000. Prior to 1990, population change was minimal, affected primarily by factors outside the community. The largest increase in population took place between 1990 and 2000 due to the development of two residential subdivisions—Winfield Ranch and French Prairie Meadows. Another subdivision, developed in 2007, and localized infill development have led to further growth since 2000 (Portland State University, Population Research Center, 2021). Gervais is a bedroom community with most working residents commuting to Salem, Portland, or Woodburn. The city has experienced steady growth over the years as developable land in the Portland metropolitan area has become more limited. Median household income in Gervais during the period 2015-2019 was \$74,191, a 31.4% increase from the previous 5-year period⁶. For more demographic and economic information, refer to Volume III, Appendix C – Community Profile.

Figure 4-1, City of Gervais Map



4.5 Critical and Important Facilities

City of Gervais’s critical and important facilities include the following:

4.5.1 Transportation

Road	Owner	Notes
OR-99E	ODOT	East of city
I-5	ODOT	A half-mile west of city
Railroad	Union Pacific	Operated by Union Pacific and Amtrak

4.5.2 Energy

- PGE, NW Natural Gas provide services to City and its residents, No above or underground fuel tanks. City staff travels to Woodburn, Mt. Angel, and Salem to use local Pacific Pride cardlock facilities.
- City is in the process of acquiring a generator for City Hall through a grant funded project, estimated completion 2023.
- Fuel storage tanks: none known. Pacific Pride in Woodburn or Mt Angel.

4.5.3 Water / Wastewater

- Water treatment plant: Two city wells and two storage tanks, each with the capacity to hold 350,000 gallons. One storage tank built in 2014; the other original tank was built in the 1980s but refurbished in 2016.
 - Location of storage tanks: 115 E. Douglas Ave.
 - Location of wells: 115 Douglas Ave. and 35 Juniper St., both in Gervais.
- Wastewater treatment plant: City operates the plant; it is co-located with lagoons area north of city limits with two (2) lift stations in town.
 - Location of wastewater treatment plant: 13000 block of Portland Rd

4.5.4 Communications

- Police communication equipment is located on City Hall.
- Landline Phone Provider: Datavision
- Cable Provider: Wave Cable
- Cell Service: Verizon with a tower in the vicinity of 40 Alder Ave., Gervais, behind local elementary school.

4.5.5 Emergency Services

- Fire: Woodburn Fire District
- Police: Two locations: Operations at City Hall; Fleet at 115 E. Douglas
- Public Works: City of Gervais, 115 E. Douglas
- CERT: Yes
- Medical: No hospitals or clinics within city limits
- Emergency Operations Center: City Hall
- City Hall: Yes, built in 2012.
- Shelter: No established cooling or warming centers.

4.5.6 Cultural/Historical Resources

- Historic homes as listed in Comprehensive Plan.
- Sam Brown House 12878 Portland Rd NE., Gervais, OR 97026 is on register, but not within the city limits.

4.5.7 Events/ Festivals

- Basketball Tournament at Sacred Heart Catholic Church: July 2022; 200-500 people
- 4th of July Celebration: approximately 1,500 people
- Annually in August, first Tuesday. National Night Out <https://natw.org/>
- May 22, 2022, Circus at Elementary School 4,000 to 5,000 attendees anticipated.
 - 150 Douglas St. Gervais, Oregon 97026

4.5.8 Environmental and Economic

- Bauman Farms: outskirts of city limits
- Small businesses: Gervais Market, Dollar General, Gervais Bar, and Summit Tile Roofing Inc.
- American Bath—largest commercial property within city limits.
- Woodburn Area Chamber of Commerce
- Amazon Fulfillment Center: 4 million square feet facility being sited approx. 1 mile north of town in Woodburn behind WinCo.
- Sam Brown Creek, a tributary of the Pudding River, has its headwaters near Gervais and runs through the community.
- A city-owned poplar farm is natural infrastructure used to address the city's wastewater. By irrigating the poplar farm instead of discharging to the creek, nutrients and elevated temperatures do not pollute the creek.

4.5.9 Functional and Access Needs (Vulnerable Populations)

- School/Day Cares: daycare/pre-k, elementary, middle, and high school (Gervais School District), Sacred Heart Catholic School.
- Assisted-Senior Living/Medical-Hospitals Facilities/Medical Fragile
 - <10 residents at 837 Lantana Ln NE, Gervais, Oregon 97026
 - <10 residents at 830 Mesquite Ln NE, Gervais, Oregon 97026
- Non-English speaking
- People with low economic status
- County Senior Services
- Cherriots (Regional Transportation-Bus), <https://www.cherriots.org/>
- Seniors/Retired
- Sacred Heart Food Bank

See hazard sections below for potential hazard-related vulnerabilities to these facilities.

4.6 Plans and Policies

Table 4-1, Plans and Policies of the City of Gervais

Document	Year
Gervais Comprehensive Plan	2015
Stormwater Master Plan	2019
Water System Master Plan	2019
Wastewater System Master Plan	2019
Economic Opportunities Analysis	2015
Housing Needs Analysis	2015

Source: City of Gervais, 2022. Public Works website.

<http://www.gervaisoregon.org/public-works.html> DLCD, 2022. PAPA Database

<https://www.oregon.gov/lcd/CPU/Pages/Adopted-Plan-Amendments.aspx>

4.7 Hazard Profile

Table 4-2, City of Gervais Hazard Profile

Community Overview							
Community Name	Population	# Of Buildings		Critical Facilities ¹	Total Building Value (\$)		
Gervais	2,620	719		3	247,297,000		
Hazus-MH Analysis Summary							
Hazard	Scenario	Potentially Displaced Residents	% Potentially Displaced Residents	Damaged Buildings	Damaged Critical Facilities	Lost Estimate (\$)	Loss Ratio
Flood ²	1% Annual Chance	0	0%	0	0	0	0%
Earthquake	Mt. Angel Mw 6.8 Deterministic	397	15%	266	4	55,400,740	22%
Exposure Analysis Summary							
Hazard	Scenario	Potentially Displaced Residents	% Potentially Displaced Residents	Exposed Buildings	Exposed Critical Facilities	Building Value (\$)	Exposure Ratio
Landslide	High and Very High Susceptibility	0	0	0	0	0	0
Channel Migration	Channel Migration Zone	0	0%	0	0	0	0%
Wildfire	High and Moderate Risk	0	0	0	0	0	0
Lahar	Medium Zone (1000 to 15000 – Year)	0	0	0	0	0	0
¹ Facilities with multiple buildings were consolidated into one building complex. ² No damage is estimated for exposed structures with “First floor height” above the level of flooding (base flood elevation).							
Critical Facilities							
Critical Facilities by Community	Flood 1% Annual Chance	Earthquake Moderate to Complete Damage	Landslide High and Very High Susceptibility	Channel Migration Zone	Wildfire High or Moderate Risk	Lahar Hazard	
None reported							

Source: DOGAMI (2022)

4.8 Hazard Analysis

The methodology for assessing risk was the same for all jurisdictions and a detailed description of the BOLD planning methodology can be found in Volume I, a brief description is below. To complete the risk assessment, the jurisdiction representatives first updated the description, type, location, and extent of each hazard. Next, they updated the Hazard Vulnerability Analysis based on each hazard’s potential impact on the community using a method developed by BOLD Planning⁷. This assessment method ranks the following factors to determine risk from the range of natural hazards identified:

1. Probability (frequency) of event,
2. Magnitude of event,
3. Expected warning time before event, and,
4. Expected duration of event.

Score	Probability	Warning Time	Magnitude/Severity	Duration
4	Highly Likely	Less than 6 hours	Catastrophic	More than 1 week
3	Likely	6-12 hours	Critical	Less than 1 week
2	Possible	12-24 hours	Limited	Less than 1 day
1	Unlikely	24+ hours	Negligible	Less than 6 hours

The assessment identifies three levels of risk: High, Medium, and Low

High - High probability of occurrence; at least 50 percent or more of population at risk from hazard; significant to catastrophic physical impacts to buildings and infrastructure; major loss or potential loss of functionality to all essential facilities (hospital, police, fire, EOC and shelters).

Moderate - Less than 50 percent of population at risk from hazard; moderate physical impacts to buildings and infrastructure; moderate potential for loss of functionality to essential facilities.

Low - Low probability of occurrence or low threat to population; minor physical impacts.

IMPACT	Range Values	
	Low CPRI	High CPRI
High	3.0	4.0
Moderate	2.0	2.9
Low	1.0	1.9

A summary of the hazard vulnerability assessment findings and rankings is presented below.

Table 4-3, Hazard Profile Summary for the City of Gervais using BOLD Planning Analysis Scoring

Hazard Profile Summary for the <u>City of Gervais</u> using BOLD Planning Analysis Scoring						
Natural Hazard	Probability	Warning Time	Magnitude	Duration	CPRI	2022 Local Planning Significance
Weight Factor	0.45	0.15	0.3	0.1		
Earthquake	3	4	4	4	3.6	High
Tornado	1	4	4	4	2.7	Moderate
Flood (including dam failure)	2	3	2	4	2.4	Moderate
Severe Weather/Storm	2	1	3	4	2.4	Moderate
Volcanic Eruption	2	3	2	4	2.4	Moderate
Extreme Weather - High Temperature	2	1	3	3	2.3	Moderate
Wildland Interface Fire	1	3	2	3	1.8	Low
Drought	1	1	1	1	1.0	Low
Avalanche	0	0	0	0	0.0	Not rated
Landslide	0	0	0	0	0.0	Not rated

Source: Marion County Emergency Management and City of Gervais, 01/10/2022; revised 3/14/22.

Table 4-4, City of Detroit Hazard Vulnerability Assessment – Other Hazards

Hazard Profile Summary for the <u>City of Gervais</u> using BOLD Planning Analysis Scoring						
Non-Natural Hazard	Probability	Warning Time	Magnitude	Duration	CPRI	2022 Local Planning Significance
Weight Factor	0.45	0.15	0.3	0.1		
Public Health	4	1	3	4	3.3	High
Hazardous Materials Release - Transportation	3	4	3	3	3.2	High
Chemical, Biological, Radiological, Nuclear, Explosive	2	4	4	4	3.1	High
Terrorism/Active Shooter/Workplace Violence	2	4	4	4	3.1	High
Fire - Residential / Commercial (Arson)	2	4	2	4	2.5	Moderate
Unauthorized Entry	2	4	2	4	2.5	Moderate
Hazardous Materials - Non-Transportation	1	4	2	3	2.0	Low
Cyberterrorism	1	4	1	4	1.8	Low
Agricultural Terrorism	1	1	1	4	1.3	Low

Source: BOLD Planning Risk Assessment Method; Analysis by the City of Detroit representatives to the NHMP update on 10/18/2021

4.9 Hazard Characteristics

Hazard History, Characteristics and Extent for Marion County apply also to the City of Gervais. Volume I, Section 2, Risk Assessment, adequately describes the characteristics of natural hazards, as well as the location and extent of potential events.

The following section identifies vulnerabilities specific to the City of Gervais, recent localized hazard events and impacts, and illustrates the basis for the city's HVA scores.

4.9.1 Avalanche

CPRI = 0.0, Risk Level: Low

Events: n/a

Vulnerability: None

4.9.2 Drought

CPRI = 1.0, Risk Level: Low

Events: n/a

Vulnerability: Water supply is in wells. No alternative water supplies, e.g., no reservoir. Two water storage tanks are each 350,000 gallons.

4.9.3 Earthquake

CPRI = 3.6, Risk Level: High

Events: No damaging earthquake events occurred during the previous five years. The 1993 Scott Mills quake caused \$28 million in damages to cities throughout Marion County.

Vulnerability: Downtown Gervais has an older stock of unreinforced masonry buildings. One water reservoir that was built in the 1980s but refurbished has a higher vulnerability. Water treatment facility was also built in the late 1980s and likely needs reinforcement to withstand an earthquake. The water distribution system would be susceptible to breakage in an earthquake event. Wastewater lagoons dikes and underground lift stations are susceptible to failure in a seismic event.

4.9.4 Extreme Heat

CPRI = 2.3, Risk Level: Moderate

Events: n/a

Vulnerability: No cooling center in the community.

4.9.5 Flood

CPRI = 2.4, Risk Level: Moderate

Events: n/a

Vulnerability: Less than probable, but possible. The Pudding River floods downstream from the city but has not impacted the city.

4.9.6 Landslide

CPRI = 0.0, Risk Level: Low

Events: n/a

Vulnerability: Gervais is very flat, there is no landslide risk.

4.9.7 Severe Weather

CPRI = 2.4, Risk Level: Moderate

Events: 2021 Ice Storm

Vulnerability: Extended power outage impacted communications, internet, which included the Emergency Operations Center. Destroyed poplar tree farm that serves wastewater plant, the city's only natural infrastructure facility that filters the city's wastewater. Debris from tree damage.

4.9.8 Tornado

CPRI = 2.7, Risk Level: Moderate

Events: n/a

Vulnerability: Scenario considered was Aumsville tornado December 14, 2010. Possible, would impact community for more than one week.

4.9.9 Wildfire

CPRI = 3.6, Risk Level: High

Events: n/a

Vulnerability: Gervais is surrounded by agricultural lands which are highly managed and pose low risk for wildfire.

4.9.10 Volcanic Eruption

CPRI = 2.4, Risk Level: Moderate

Events: 1980 Mount St Helens eruption.

Vulnerability: The City would have 6 to 12 hours before ash from an eruption of Mt. Hood, etc. impacted the community; impacts could last more than a week.

4.10 Mitigation Strategy

During the 2022 Marion County Hazard Mitigation Plan and Gervais Addendum update process, the Oregon Department of Land Conservation & Development and Gervais city staff developed a list of priority actions. These actions were prioritized and then reviewed internally by staff and city council during the spring of 2022.

4.10.1 City of Gervais Mitigation Tables

The following pages include the city's initial list of Priority Action Items (Table 4.5).

Table 4-5, City of Gervais “Priority” Action Items

#	Hazard	Mitigation Action	Priority	Timeline	Cost	Description	Status
2022-MH-1	Multi-Hazard	Install a backup generator for the Emergency Operations Center (EOC) at the Gervais City Hall.	H	1-3 years	\$75k	The city was awarded a grant for a generator through Marion County Emergency Management and OEM. Construction is planned for Summer 2022.	New
2022-MH-2	Multi-Hazard	Partner with Woodburn Fire on the construction of a local fire house in Gervais.	H	1-3 years	\$2.2 million	Fire District is currently looking for possible locations and plans to fund the structure with a renewal bond, grants, and loans. Land and some funding would be the city’s role.	New
2022-MH-3	Multi-Hazard	Coordinate evacuation planning with Marion County Emergency Management and Woodburn.	H	1-3 years	Staff time	The city would like to coordinate on regional efforts to improve emergency response or planning.	New
2022-EQ-1	Earthquake	Consider seismic retrofits such as flexible pipe connectors for water treatment facilities.	M	5-10 years	TBD	In an earthquake event, it would be ideal to prevent water distribution lines from breaking. If flexible connectors are installed at key locations to be determined by a consultant, some sections of line could be more easily repaired, and water conserved.	New
2022-EQ-2	Earthquake	Consider seismic retrofits such as automatic shutoff valves for water treatment facilities.	M	5-10 years	TBD	In an earthquake event, it would be ideal to prevent loss of water supply or discharge of waste.	New

Source: City of Gervais, 03/14/2022.

5 City of Hubbard Addendum

5.1 Purpose

This document serves as the City of Hubbard’s Addendum to the Marion County Multi-Jurisdictional Hazards Mitigation Plan (HMP). The purpose of this addendum is to guide the implementation of mitigation actions by the City of Hubbard to improve the resilience of the community. Mitigation planning is a long-term endeavor—one that requires broad internal involvement and community engagement to be successful.

Information contained in Volume I (Basic Plan) and Volume III (Appendices) of the HMP provides additional information (hazard characteristics/events/extent, countywide mitigation actions, and community profile data) and forms the basis of this addendum.

5.2 Plan Process, Participation, and Adoption

In the summer and fall of 2021 Marion County partnered with the Oregon Department of Land Conservation and Development and the Oregon Department of Emergency Management (OEM), and Marion County cities, including the City of Hubbard, to update their addendum to the Marion County Hazard Mitigation Plan, which expired August 16, 2022.

By developing this addendum to the Marion County HMP, locally adopting it, and having it approved by FEMA, the City of Hubbard will gain eligibility for FEMA Hazard Mitigation Assistance (HMA) funding that includes three programs: Building Resilient Infrastructure & Communities (BRIC), formerly the Pre-Disaster Mitigation grant program, the Hazard Mitigation Grant Program (HMGP), and the Flood Mitigation Assistance (FMA) program. This project is funded through the Federal Emergency Management Agency’s (FEMA) FY19 Pre- Disaster Mitigation Competitive Grant Program (PDMC-PL-10-OR-2019-003).

The City of Hubbard 2022 Hazard Mitigation Committee is comprised of the following:

- Convener, City of Hubbard Public Works Administrative Manager Melinda Olinger
- City of Hubbard Police Chief Dave Rash
- Hubbard Rural Fire Protection District Fire Chief Joe Budge
- Hubbard Rural Fire Protection District Assistant Fire Chief Michael Kahrmann

The City of Hubbard joined the Marion County HMP update by approving an intergovernmental agreement with DLCD in October 2021. On December 9, 2021, Representatives from the City of Hubbard (Melinda Olinger, Dave Rash, Hubbard RFPD (Joe Budge, Michael Kahrmann), Marion County Emergency Preparedness Coordinator Mike Hintz, and DLCD Planner Tricia Sears conducted a risk assessment meeting with the City of Hubbard that included a Hazard Vulnerability Assessment ranking. The Hazard Mitigation Committee coordinated internally on documents for the City of Hubbard. City staff met again with DLCD on May 12, 2022, to update this addendum. The city shared the addendum with City Council at their June 14th and July 12th meetings of 2022.

City of Hubbard staff attended the majority of Marion County HMP Steering Committee meetings and promoted the HMP survey and outreach efforts throughout the plan update, including public posts on the City’s website and Facebook page on January 18, 2022, to distribute the plan update public survey to interested parties in the City of Hubbard service area.

5.3 Risk Assessment

A risk assessment is intended to provide the “factual basis for activities proposed in the strategy to reduce losses from identified hazards (Department of Homeland Security, Federal Emergency Management Agency, 2023). This section of the HMP addendum can serve as the factual basis for addressing Oregon Statewide Planning Goal 7 – Areas Subject to Natural Hazards.

5.4 Community Profile

This section provides information on city specific assets and populations. For additional information on the characteristics of the City of Hubbard, in terms of geography, environment, population, demographics, employment and economics, as well as housing and transportation see Volume III, Appendix B, Community Profile. Many of these community characteristics can affect how hazards impact communities and how communities choose to plan for hazard mitigation. Considering the City’s specific assets during the planning process can assist in identifying appropriate measures for hazard mitigation.

5.4.1 Community Characteristics

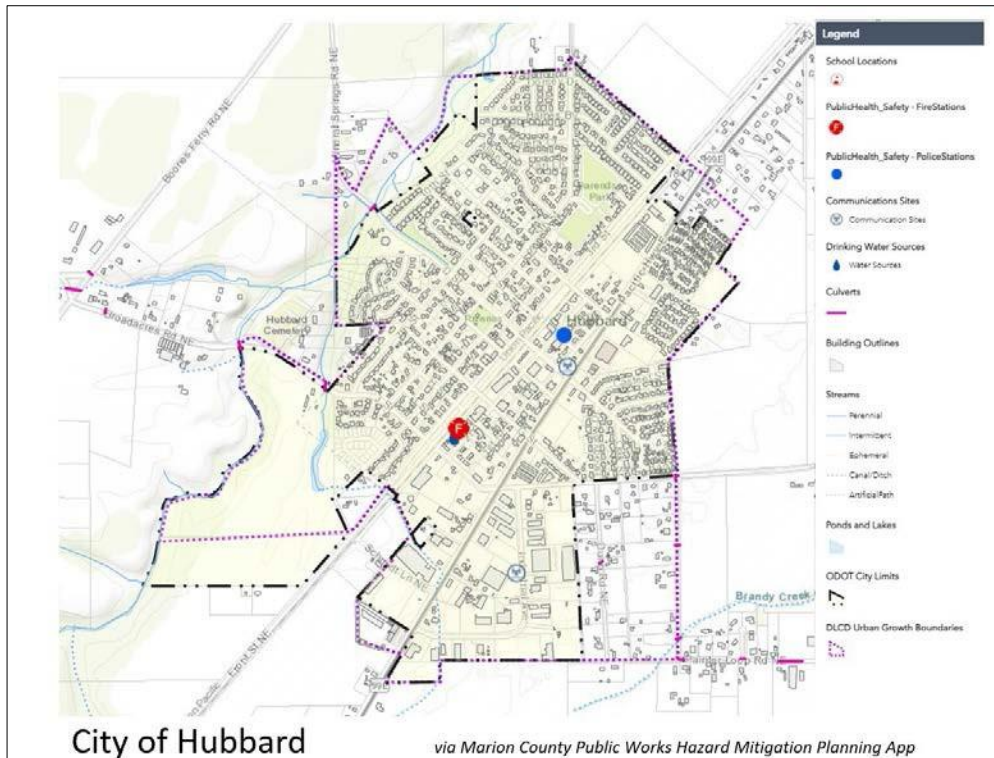
The City of Hubbard is in the Willamette Valley in Marion County, Oregon, approximately 30 miles south of the City of Portland. Hubbard experiences a moderate climate with an average high temperature of 82 degrees and low of 54 degrees in August, and an average high temperature of 47 and low of 35 in January. The city receives an average annual precipitation of 40.7 inches. The confluence of Mill Creek and Little Bear Creek is along the west side of Hubbard. Hubbard is located on a flat area, with farmland surrounding the city on all sides.

The Population Research Center at Portland State University lists Hubbard’s 2020 population at 3,454. This represents a 36.9% increase from 2000 (Portland State University, Population Research Center, 2021). For more demographic information, refer to Volume III, Appendix C – Community Profile.

5.4.2 Economy

Historically, the City of Hubbard was an agricultural and light industrial community that is based upon the nursery, hops, hazelnut, and hemp industries. Today, Hubbard’s economy is still largely based on its proximity Woodburn and to I-5. Median household income in Hubbard 2015-2019 was \$59,803, a 14.1% increase from the previous 5-year period (Portland State University, Population Research Center, 2021) For more economic information, refer to Volume III, Appendix C – Community Profile.

Figure 5-1, City of Hubbard Map



5.4.3 Hubbard Rural Fire Protection District

The Hubbard Fire District serves the City of Hubbard and the surrounding areas, covering 1.5 square miles. The district is a combination district with 4 full-time employees and 33 volunteer members. Career members work 24 hour shifts with daily staffing supplemented by volunteer members. Close working relationships with neighboring fire districts have been established through both mutual and auto-aid emergency response agreements and intergovernmental contacts. The Hubbard Fire District provides all hazard response, including fire suppression, emergency medical services, motor vehicle accident response, hazmat mitigation, and public services. The district offers part time advanced life support and full-time basic life support. The district responded to a total of 800 incidents in 2020 (Hubbard Rural Fire Protection District, 2022).

5.5 Critical and Important Facilities

City of Hubbard’s critical and important facilities include the following:

5.5.1 Transportation

- See designated truck route map.
- Broadacres, Boones Ferry Rd, Pacific Hwy 99E main road, Whiskey Hill Rd turns into J Street, D Street turns into Mineral Springs Rd
- The Union Pacific Railroad runs parallel to Pacific Highway 99E through Hubbard (between 2nd & 3rd Streets). The fire station, City Hall and our WTP, well #1 and one of our 1,000,000 gallon above-ground reservoirs are near the tracks and are vulnerable

to a train derailment incident. The fire station is our primary EOC, and City Hall is our secondary EOC.

- Hubbard is served by Canby Transit and Cherriots for public transit.
- First Student is the area's school bus company. No schools are within the city limits. Schools are located at 20246 Grim Rd., Aurora. First Student has a local parking area on "J" Street for school buses.
- Interstate-5 runs north-south to the west of the City of Hubbard.

5.5.2 Energy

- Natural gas pipeline runs along Hwy 99E.
- PGE provides electric service.
- City has backup generators at city hall, fire station, water plant, wastewater plant, and water tower locations.
- City has no fuel storage, but a fuel storage plan or facility is under development.
- Gas is available at cardlock and regular gas stations, but if the electricity goes out Tualatin is the closest supply. City has reached out to farmers to get needed fuel in the past.

5.5.3 Communications

- Dispatch service is provided by METCOM 911
- All Police, Public Works and Fire have radio access.
- All Police, Public Works and Fire have cell phones.
- Verizon and T-Mobile have equipment located on the water tower (3652 1st Street). Verizon has a backup generator on-site.
- T-Mobile (originally Sprint) has a telecommunications tower located at 2783 Industrial Avenue
- Police, Public Works, and Administration internet is provided by Datavision.
- Comcast, Datavision, Wave and Century Link all provide service throughout the city.
- The city server is backed up daily on an autotimer.

5.5.4 Water/ Wastewater

- City owned water system:
 - Water Treatment Plan, 3101 2nd Street
 - Well #1 3101 2nd Street
 - Well #2 2600 "D" Street
 - Well #3 3652 1st Street
 - Well #4 2858 "J" Street

- 1,000,000 gallon above-ground storage tank 3101 2nd Street
- 1,000,000 gallon above-ground storage tank 2858 “J” Street
- 50,000-gallon elevated water tower 3652 1st Street (elevated tank currently provides water pressure for the system.
- Hood view Estates has private well.
- 2674 Pacific Hwy 99E has a private well.
- The city’s owned wastewater system.
 - Waste Water Treatment Plan and Public Works main office 3607 Sunset Drive.
 - Lift Station 3607 Sunset Drive
 - Lift Station 3rd and “J” Streets
- 3133 and 3113 Schmidt Lane have private septic systems.
- 2674 Pacific Hwy 99E has a private septic system.
- 2021 Winter Storm Fuel issue: Generators at water treatment plant were damaged by bad fuel during the event. The city is looking at funding to replace generator. Internet is needed but can be operated manually but much harder.

5.5.5 Emergency Services

- Fire protection by Hubbard Rural Fire Protection District (RFPD).
- Police protection by Hubbard Police Department.
- Emergency Operations Center
 - Primary: Hubbard RFPD
 - Secondary: City Hall 3720 2nd St., Hubbard, OR
- Medical: Closest services in Canby or Woodburn.
- No CERT Team currently
- Shelter/Mass Care: No agreements in place, just work with the County.

5.5.6 Cultural/Historical Resources

- n/a

5.5.7 Events/ Festivals

- Hop Festival – July, Hosted by Volunteer Committee, 1–2-day event, 4 to 5k attendees.

5.5.8 Environmental/ Economic

- Agriculture and Light Industrial / Commercial
- Hops, Hazelnuts, Nursery

5.5.9 Functional and Access Needs (Vulnerable Populations)

- Schools: No schools in Hubbard.
- Mobile Home Parks
- NE section of city is of a lower economic level than average.
- 33% of the City’s population speaks Spanish; some residents may need materials in a disaster event translated into Spanish. City strives for bi-lingual flyers. Bi-lingual staff would be needed in an evacuation or other emergency event.
- No assisted living facilities in Hubbard.

See hazard sections below for potential hazard-related vulnerabilities to these facilities.

5.6 Plans and Policies

Table 5-1, Plans and Policies of the City of Hubbard and Hubbard RFPD

Document Name	Year
Hubbard Emergency Operations Plan (currently being updated)	2022
Hubbard Comprehensive Plan	2013
Transportation System Plan	2012
Stormwater Master Plan	1996
Water Master Plan	2020
Wastewater Facilities Plan (currently being updated)	2022

Source: Source: City of Hubbard, 2022.

5.7 Hazard Profile

Table 5-2, City of Hubbard Hazard Profile

Community Overview							
Community Name	Population	# Of Buildings		Critical Facilities ¹	Total Building Value (\$)		
Hubbard	3,315	1,187		3	458,199,000		
Hazus-MH Analysis Summary							
Hazard	Scenario	Potentially Displaced Residents	% Potentially Displaced Residents	Damaged Buildings	Damaged Critical Facilities	Lost Estimate (\$)	Loss Ratio
Flood ²	1% Annual Chance	0	0%	0	0	0	0%
Earthquake	Mt. Angel Mw 6.8 Deterministic	397	11%	466	3	125,813,507	28%
Exposure Analysis Summary							
Hazard	Scenario	Potentially Displaced Residents	% Potentially Displaced Residents	Exposed Buildings	Exposed Critical Facilities	Building Value (\$)	Exposure Ratio
Landslide	High and Very High Susceptibility	6	0.2%	2	0	594,000	0.1%
Channel Migration	Channel Migration Zone	0	0%	0	0	0	0%
Wildfire	High and Moderate Risk	0	0	0	0	0	0
Lahar	Medium Zone (1000 to 15000 – Year)	0	0	0	0	0	0
¹ Facilities with multiple buildings were consolidated into one building complex. ² No damage is estimated for exposed structures with “First floor height” above the level of flooding (base flood elevation).							
Critical Facilities							
Critical Facilities by Community	Flood 1% Annual Chance	Earthquake Moderate to Complete Damage	Landslide High and Very High Susceptibility	Channel Migration Zone	Wildfire High or Moderate Risk	Lahar Hazard	
None Reported							

Source: DOGAMI (2022)

5.8 Hazard Analysis

The methodology for assessing risk was the same for all jurisdictions and a detailed description of the BOLD planning methodology can be found in Volume I, a brief description is below. To complete the risk assessment, the jurisdiction representatives first updated the description, type, location, and extent of each hazard. Next, they updated the Hazard Vulnerability Analysis based on each hazard’s potential impact on the community using a method developed by BOLD Planning⁷. This assessment method ranks the following factors to determine risk from the range of natural hazards identified:

1. Probability (frequency) of event.
2. Magnitude of event.
3. Expected warning time before event.
4. Expected duration of event.

Score	Probability	Warning Time	Magnitude/Severity	Duration
4	Highly Likely	Less than 6 hours	Catastrophic	More than 1 week
3	Likely	6-12 hours	Critical	Less than 1 week
2	Possible	12-24 hours	Limited	Less than 1 day
1	Unlikely	24+ hours	Negligible	Less than 6 hours

The assessment identifies three levels of risk: High, Moderate and Low.

High - High probability of occurrence; at least 50 percent or more of population at risk from hazard; significant to catastrophic physical impacts to buildings and infrastructure; major loss or potential loss of functionality to all essential facilities (hospital, police, fire, EOC and shelters).

Moderate - Less than 50 percent of population at risk from hazard; moderate physical impacts to buildings and infrastructure; moderate potential for loss of functionality to essential facilities.

Low - Low probability of occurrence or low threat to population; minor physical impacts.

IMPACT	Range Values	
	Low CPRI	High CPRI
High	3.0	4.0
Moderate	2.0	2.9
Low	1.0	1.9

A summary of the risk assessment findings and rankings is presented below.

Table 5-3, City of Hubbard Hazard Vulnerability Assessment – Natural Hazards

Hazard Profile Summary for the <i>City of Hubbard</i> using BOLD Planning Analysis Scoring						
Natural Hazard	Probability	Warning Time	Magnitude	Duration	CPRI	2022 Local Planning Significance
Weight Factor	0.45	0.15	0.3	0.1		
Earthquake	4	4	4	4	4.0	High
Wildland Interface Fire	4	4	4	4	4.0	High
Severe Weather/Storm	4	3.5	3	4	3.6	High
Extreme Weather - High Temperature	4	2	3	4	3.4	High
Tornado	2	4	4	4	3.1	High
Flood *	2	2	3	3	2.4	Moderate
Drought	2	1	3	4	2.4	Moderate
Landslide	2	2	2	4	2.2	Moderate
Volcanic Eruption	1	1	3	4	1.9	Low
Avalanche**	1	1	1	1	1.0	Low

Source: BOLD Planning Risk Assessment Method; Analysis by Marion County Emergency Management; City of Hubbard; Hubbard RFPD, 12/7/21 *Including Dam Failure, **New in 2021

Table 5-4, City of Hubbard Hazard Vulnerability Assessment – Non-Natural Hazards

Hazard Profile Summary for the City of Hubbard using BOLD Planning Analysis Scoring						
Non-Natural Hazard	Probability	Warning Time	Magnitude	Duration	CPRI	2022 Local Planning Significance
Weight Factor	0.45	0.15	0.3	0.1		
Public Health	4	1	3	4	3.3	High
Hazardous Materials Release - Transportation	3	4	3	3	3.2	High
Chemical, Biological, Radiological, Nuclear, Explosive	2	4	4	4	3.1	High
Terrorism/Active Shooter/Workplace Violence	2	4	4	4	3.1	High
Fire - Residential / Commercial (Arson)	2	4	2	4	2.5	Moderate
Unauthorized Entry	2	4	2	4	2.5	Moderate
Hazardous Materials - Non-Transportation	1	4	2	3	2.0	Low
Cyberterrorism	1	4	1	4	1.8	Low
Agricultural Terrorism	1	1	1	4	1.3	Low

Source: Hazard Profile Summary for the City of Hubbard using BOLD Planning Analysis Scoring

5.9 Hazard Characteristics

Hazard History, Characteristics and Extent for Marion County apply also to the City of Hubbard. Volume I, Section 2, *Risk Assessment*, adequately describes the characteristics of natural hazards, as well as the location and extent of potential events. This section identifies vulnerabilities specific to the City of Hubbard, recent localized hazard events and impacts, and illustrates the basis for the city's HVA scores.

5.9.1 Avalanche

CPRI = 1.0, Risk Level: Low

Events: n/a

Vulnerability: none

5.9.2 Drought

CPRI = 2.4, Risk Level: Moderate

Events: n/a

Vulnerability: An extended drought has the potential to limit the ability of the City's wells to keep up with demand, particularly during high water use periods.

5.9.3 Earthquake

CPRI = 4.0, Risk Level: High

Events: On March 25, 1993, a Mw 5.7 earthquake occurred with an epicenter approximately 3 miles east of the City of Scotts Mills, Oregon. Many buildings were damaged from the event, including the capitol building in Salem. The many unreinforced buildings in the area were significantly damaged due to intense shaking." (DOGAMI, 2022)

Vulnerability: There are several single-story unreinforced masonry buildings (URMs) in the community. City Hall, the alternate EOC, was built in 1800's and seismic improvements have been completed. Damage could also disrupt City services including water, sewer, transportation, and communications. Private services could also be disrupted including power, disposal, and the supply chain of critical resources.

The communities in the northeast part of the county (Gervais, Hubbard, Mt. Angel, Scotts Mills, Silverton, and Woodburn), close to the Mount Angel Fault all have higher levels of estimated losses compared the rest of the county. (DOGAMI, 2022)

5.9.4 Extreme Heat

CPRI = 3.4, Risk Level: High

Events: n/a

Vulnerability: No cooling center locally, so community members must travel outside the city for cooling center facilities. The city conducts spot checks on vulnerable persons.

5.9.5 Flood

CPRI = 2.4, Risk Level: Moderate

Events: No major flood events 2017-2021.

Vulnerability: Some areas in the western part of the city are vulnerable to flooding from Mill Creek. The City's lower wastewater treatment plant is in the floodplain. In addition, there are some areas throughout the city which experience localized flooding during high rain events.

Figure 5-2, Hubbard Flood Hazard Map 1

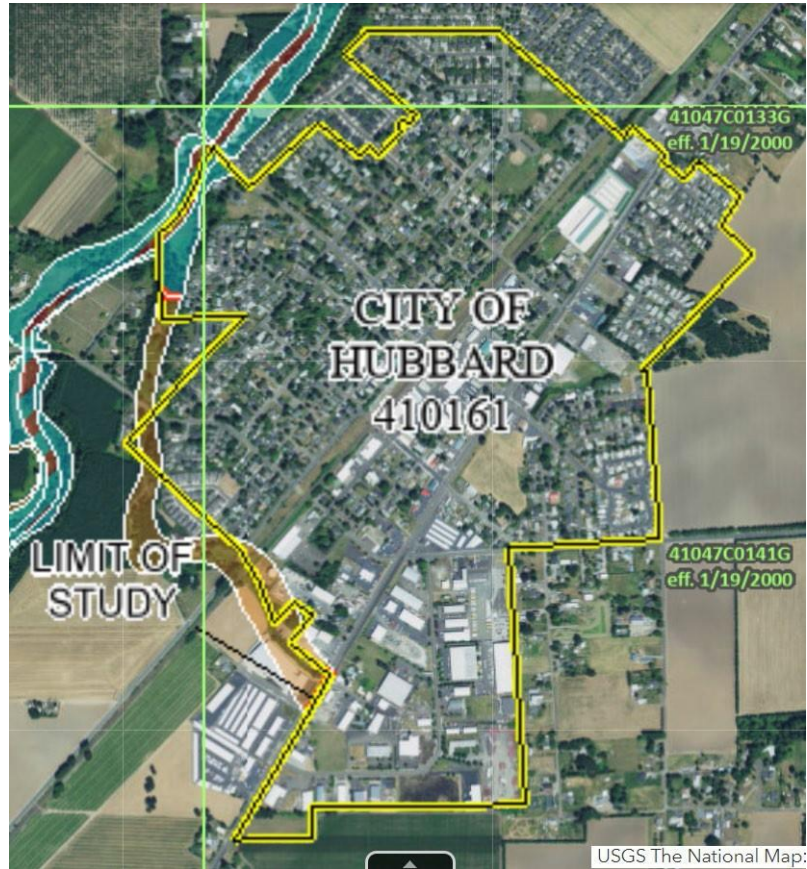
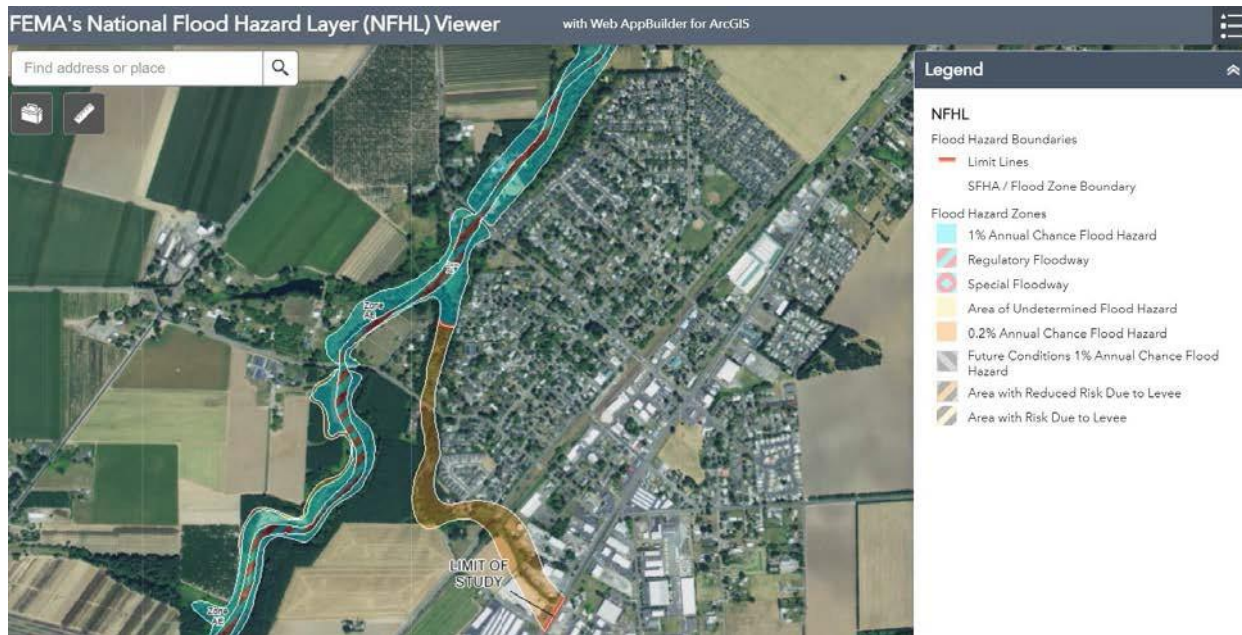


Figure 5-3, Hubbard Flood Hazard Map 2



5.9.6 Landslide

CPRI = 2.2, Risk Level: Moderate

Events: NA

Vulnerability: NA

5.9.7 Severe Weather

CPRI = 3.6, Risk Level: High

Events: 2021 Winter Storm; Periodic Extreme Heat

Vulnerability: Risk is primarily from downed trees blocking roads and impacting powerlines. The extended power outage experienced during the 2021 Winter Storm highlighted the challenges of keeping the City's emergency generators fueled and running 24/7 for extended periods of time. These generators provide power to both the water system, sewer system, and computer/SCADA systems. The city does not have local warming/cooling centers, so travel is required for our community to access these resources.

5.9.8 Tornado

CPRI = 3.1, Risk Level: High

Events: Aumsville tornado December 14, 2010.

Vulnerability: Homes and businesses are vulnerable to high wind forces created by a tornado. Structures and critical equipment can be damaged both by the tornado itself and falling trees, branches, and other debris.

5.9.9 Wildfire

CPRI = 4.0, Risk Level: High

Events: n/a

Vulnerability: The Mill Creek Wildland Area is a large track of dense trees and undergrowth that runs through the Hubbard Fire District. While this area is subdivided into many tax lots there are no distinguishable property lines or markings. It is just one large area. The fire danger is high from the unmanaged undergrowth, the damage and debris from the ice storm of 2020, and the lack of maintenance in the form of fuel reduction. A wildfire in this area would threaten all structures located on the perimeter of this area. Wildfire would burn through this area very quickly and the Hubbard Fire District would have a problem putting a stop to the fire based on the amount of fuel, limited access, and lack of defensible spaces or fire breaks.

A total of 179 structures, residential homes, and their outbuildings, are in direct danger in the event of a wildfire in the Mill Creek Area. Another 97 structures have been identified as secondary exposures. In addition to the property at risk are the lives of those occupants. A fast-moving wildfire, especially wind driven, would have the potential to put many lives and properties at risk as well. The impact on the citizens and communities of Hubbard would be extremely great. This would impact those who live and work in the community as well as the local economics. A reduction of property value would cause budget shortfalls in property tax collections for the City of Hubbard and the Hubbard Fire District. Rebuilding from a catastrophic fire would take a minimum of several years.

5.9.10 Volcano

CPRI = 1.9, Risk Level: Low

Events: n/a

Vulnerability: The City is vulnerable to falling ash as it is corrosive and can get into critical equipment, potentially damaging or rendering equipment useless. In addition, falling ash can cause health issues.

5.10 Mitigation Strategy

During the 2022 Marion County Hazard Mitigation Plan and the City of Hubbard Addendum update process, Oregon Department of Land Conservation & Development and the City of Hubbard developed a list of priority actions. These actions were prioritized and then reviewed internally by staff and city council during the spring of 2022.

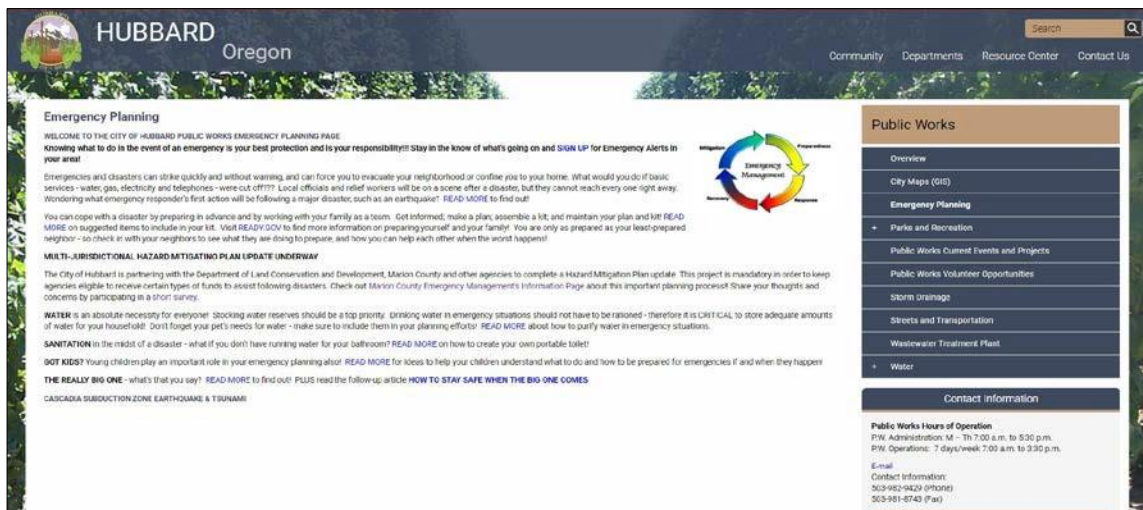
5.10.1 Ongoing Mitigation Actions

- City newsletter is issued six times per year, usually with a focus on emergency preparedness.
- Website is regularly updated with information on emergency preparedness.
- Backup generators are test-run on a weekly basis and re-fueled quarterly or as needed.
- Catch basins are cleared prior to rain events.
- Sand and sandbags are stocked and made available to our community on a self-serve basis for localized flooding.
- City staff are equipped with emergency go-packs.
- Service trucks fuel tanks are kept half full at a minimum.

5.10.2 Mitigation Success

The City of Hubbard actively educates the community on emergency preparedness via their website and City newsletter, and previously through emergency preparedness fairs.

Figure 5-4, Hubbard Emergency Planning



5.10.3 City of Hubbard Mitigation Action Tables

The following pages includes the city's initial Priority Action Items (Table 5-5).

Table 5-5, City of Hubbard “Priority” Actions

#	Hazard	Mitigation Action	Priority	Timeline	Cost	Description	Status
2022-MH-1	Multi-Hazard	Fire Hall dormitory improvements.	High	1-3 years Short-term	\$180k	Funding: ARPA	New
2022-MH-2	Multi-Hazard	Fuel storage plan development and implementation	High	Short-term	\$20k+	Funding: \$20k Public Works fund allocated.	New
2022-WF-1	Wildland Fire	Mill Creek Wildland Fuel Reduction Plan	High	Short-term	TBD	Funding: \$20k Public Works fund allocated.	New
2022-MH-3	Multi-Hazard	Update the Hubbard Comprehensive plan to reflect the characteristics of high priority hazards and recommended policies and implementation actions that reflect new hazard information.	High	1-3 years	\$40k	Funding: under development	New
2022-MH-4	Multi-Hazard	Replace Water Treatment Plant Generator	High	Short-term	\$20k+	Will be incorporated into the pending Water System Improvements Project. Funding: ARPA, City funds	New
2022-MH-5	Multi-Hazard	Emergency Communications Upgrade	High	2-5 years	TBD	Partners: METCOM, Sheriff’s Office, Public Works Director.	New
2022-MH-6	Multi-Hazard	Public Education	High	Ongoing	Staff Time		New
2022-MH-7	Multi-Hazard	Review Marion County’s Mitigation Actions to determine potential partnership.	High	Ongoing	Staff Time	Mill Creek riparian zone	New
2022-MH-8	Multi-Hazard	Replacement of City Hall, Police, and Public Works for seismic, other resilience.	Medium	Long-term	TBD	Public Works and Police Dept. would be in City Hall, as well as EOC and outdoor assembly area.	New
2022-FL-1	Flood	Develop a stormwater master plan.	Medium	Long-term	\$100k+	Outdated but lack funding. Need to address localized flooding issues.	New
2022-EQ-1	Earthquake	Evaluate critical facilities for seismic preparedness by identifying structural deficiencies and vulnerabilities to dependent systems (e.g., water, fuel, power).	Medium	Long-term	\$100k+	Added based upon 2022 DOGAMI Risk Report recommendation.	New

Source: City of Hubbard, 5/12/22.

6 City of Idanha Addendum

6.1 Purpose

This document serves as the City of Idanha’s Addendum to the Marion County Multi-Jurisdictional Hazards Mitigation Plan (HMP). The purpose of this addendum is to guide the implementation of mitigation actions by Idanha to improve the resilience of the community. Please note that mitigation planning is a long-term endeavor—one that requires broad internal involvement and community engagement to be successful. Finally, please refer to the information contained in Volume I (Basic Plan) and Volume III (Appendices) of this HMP, which provides additional information (particularly regarding participation and mitigation strategy) and forms the basis of this addendum.

6.2 Plan Process, Participation, and Adoption

In 2021 and early 2022, Marion County partnered with the Oregon Department of Land Conservation and Development (DLCD) and the Oregon Department of Emergency Management (OEM), and Marion County cities, including Idanha, to update their addendum to the Marion County Hazard Mitigation Plan, which expired August 16, 2022.

By developing this addendum to the Marion County HMP, locally adopting it, and having it approved by FEMA, the Idanha will gain eligibility for FEMA Hazard Mitigation Assistance (HMA) funding that includes three programs: Building Resilient Infrastructure & Communities (BRIC), formerly the Pre-Disaster Mitigation grant program, the Hazard Mitigation Grant Program (HMGP), and the Flood Mitigation Assistance (FMA) program. This project is funded through the Federal Emergency Management Agency’s (FEMA) FY19 Pre- Disaster Mitigation Competitive Grant Program (PDMC-PL-10-OR-2019-003).

The City of Idanha joined the Marion County HMP update by executing an intergovernmental agreement with DLCD on October 27, 2021. On October 28, 2021, Rebecca Stormer, City Manager/City Recorder, and Robyn Johnson, City Clerk, met with Marion County Emergency Manager Kathleen Silva, and DLCD Planner Tricia Sears to conduct a risk assessment meeting with the City of Idanha that included a Hazard Vulnerability Assessment ranking. City staff met again with DLCD on March 31, 2022, to update this addendum.

Idanha staff have been unable to attend HMP Steering Committee meetings due to wildfire impacts to communication and transportation lifeline infrastructure during the Beachie Creek and Lionhead fires. However, Idanha staff have worked with City Council to promote the HMP survey and outreach efforts throughout the plan update to engage interested parties in the Idanha service area.

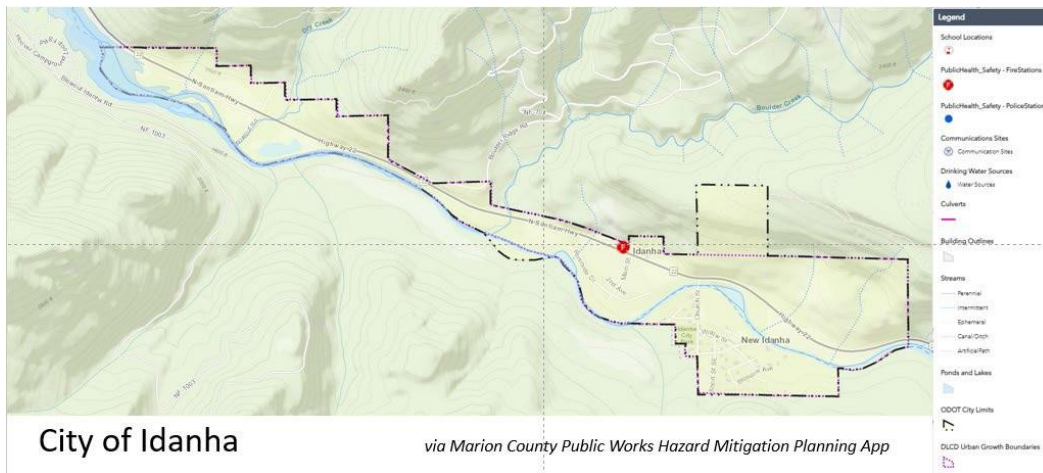
6.3 Risk Assessment

A risk assessment is intended to provide the “factual basis for activities proposed in the strategy to reduce losses from identified hazards” (Department of Homeland Security, Federal Emergency Management Agency, 2023). This section of the HMP addendum can serve as the factual basis for addressing Oregon Statewide Planning Goal 7 – Areas Subject to Natural Hazards.

6.4 Community Profile

This section provides information on city specific assets and populations. For additional information on the characteristics of Idanha, in terms of geography, environment, population, demographics, employment and economics, as well as housing and transportation see Volume III, Appendix B, *Community Profile*. Many of these community characteristics can affect how hazards impact communities and how communities choose to plan for hazard mitigation. Considering the city specific assets during the planning process can assist in identifying appropriate measures for hazard mitigation.

Figure 6-1, City of Idanha Map



6.4.1 Community Characteristics

Idanha is located approximately 57 miles east of Salem, bordering the North Santiam River. It is the smallest community in the North Santiam River Canyon with a population of 148. Idanha’s urban growth boundary (UGB) spans two counties. In 2020, the Linn County UGB population was 58 people, while the Marion County UGB population was 90 people (Portland State University, Population Research Center, 2021). With an elevation of 1718 feet, the climate of Idanha is moderate; the average monthly temperatures range from 50 – 80 degrees in July and August, and 29-41 degrees in December and January. Idanha receives approximately 66 inches of rain and 35 inches of snow each year. The city’s topography is relatively flat with steep slopes surrounding the area along Hwy 22.

6.4.2 Economy

Idanha benefits from its location along Hwy 22, a major east-to-west transportation route connecting Salem to Bend. Median household income in Idanha during the period 2015-2019 was \$43,500, a 20.3% increase from the previous 5-year period (U.S. Census Bureau, 2022). But due to its small population size and lack of development, the city lacks many commercial amenities. The city has one retail storefront along Hwy 22, but most of the manufacturing and timber related employment has left the city. Historically, Idanha prospered from the development of the railroad and dam, which helped spur growth in manufacturing, logging, and fishing. Today, the economy relies upon the recreational opportunities available through state/federal lands, and the North Santiam River.

Unfortunately, these lands and the related opportunities were severely impacted by the wildfires of 2020. Prior to the wildfires, the PSU Population Research Center reported for the Linn County portion of the UGB that features ‘New’ Idanha, “the 5-year average annual housing unit growth rate is generally very low and is assumed to slightly increase to 0.13 percent during the first 10 years and then very slightly decline to almost zero thereafter. The occupancy rate is assumed to be steady at 76.9 percent throughout the 50-year horizon...There is no group quarters population in Idanha.”

6.5 Critical and Important Facilities

Idanha’s critical and important facilities include the following:

6.5.1 Communication/Information Technology

There is currently one communication provider in Idanha. Frontier provides phone service, and various satellite businesses provide broadband speed internet.

Strengths:

- Most residents utilize scanners or citizen band (CB) radios.
- A phone substation is in nearby Detroit.

Weaknesses:

- Limited internet speeds and provider access.
- Poor phone services and reception.
- Main communication line runs down highway 22 and is susceptible to from trees and wind.

6.5.2 Water

The City of Idanha has two water sources from Chittum Creek, and Mud Puppy Creek fed by a natural spring named rainbow creek. This system currently utilizes a surface water intake to pull water from these sources. The city also contains dike and jetty infrastructure along the North Santiam River. However, the town is still vulnerable due to the geographic topography of the river.

6.5.3 Dams

Two dams sit below Idanha, *Detroit Dam* and *Big Cliff Dam*. Previous steering committees have concluded that the likelihood of Dam Failure is **Low**⁵. Current conditions still represent the previous decision. If Dam failure occurred in either dam, Idanha would most likely lose access to the western portion of Hwy 22.

Strengths:

- (2) water intake sources (Chittum & Mud Puppy Creek)
- (1) backup diesel generator on-site, near water intake sources.

Weaknesses:

- Limited diesel fuel is available inside of city limits.
- Water intake sources are susceptible to wildfire damage.
- The city is losing large amounts of water distributed through leaky pipes.

6.5.4 Transportation Systems

Oregon Route 22 is the major transportation route for auto, public transit, and emergency vehicle access throughout the Santiam Canyon. Hwy 22 spans about 57 miles west, connecting Idanha to Salem and the remainder of the Willamette Valley. To the east, the highway connects Idanha to the Santiam Pass interchange.

The Cherriots Canyon Connector is the only existing public transit service in the entire Santiam Canyon. This route has three total round trips with buses running approximately every (5) hours. Idanha residents are forced to drive to Gates to utilize these services, as the canyon connector does not reach Detroit or Idanha.

In case of a major Oregon Route 22 closure, Idanha residents will have to rely on alternate routes to reach supplies or safety. The cities alternate routes are limited with NF-2231, NF-2233, and NF-2234. Depending on weather conditions, these roads may be unpassable.

The city is home to a bridge that crosses over the North Santiam River. Water lines that serve the population in “New Idanha” are co-located on this bridge. Bridge failure could disrupt water services for these residents.

Bridges

Structure Name	Year Built	Structural Condition
Church St. Bridge	n/a	Fair

Strengths:

- Proximity to ODOT facility may increase access to public works services.
- The Idanha-Detroit RFD location is in city limits and could be utilized in a hazard event.

- National Forest Roads exist outside of Idanha and could be utilized as emergency evacuation routes.

Weaknesses:

- Loss of Church St. Bridge would isolate a large percentage of Idanha residents.
- Loss of Church St. Bridge could disrupt drinking water services.
- Alternate routes are long, and most likely impassible in winter months.
- Hwy 22 closures could make travel outside of North Santiam Canyon extremely difficult.
- Public transportation options are limited and only reach to the city of Gates.
- The lack of a pedestrian sidewalk along Hwy 22 created safety hazards for pedestrians.

6.5.5 Energy & Utilities

Idanha receives energy and utility services from Consumer Power Inc. There are no substations located in Idanha. One main power line runs along Hwy 22, connecting to Detroit, Gates, and Mill City.

Strengths:

- Many residents have their own generators and are able to power basic home amenities during power outages.
- Most residents utilize firewood as a heating source, making them more resilient in case of a power outage.

Weaknesses:

- No fueling stations exist within city limits.
- Nearby gas stations in Detroit do not currently possess backup diesel generators to pump fuel from storage tanks.
- No alternate sources of energy (wind, solar) exist to power basic services.
- Downed power lines are a reoccurring issue around Hoover Campground (Santiam Park).
- Power lines are co-located on the bridge.
- Residents rely on wood burning stoves for heat.

6.5.6 Agriculture and Food

Although Idanha possesses the “Idanha County Store” the closest large-scale grocery exists down Hwy 22 in Stayton, Oregon. The loss of Hwy 22 as a transportation route would cause serious concern for residents and food accessibility. The city is surrounded by steep slopes that are state and federal land. There is no agricultural capability other than small-scale “urban” farms within city limits.

Strengths:

- Country stores within city limits provides limited amenities and food supplies.
- Many residents have food storage already in place because of the lack of availability.

Weaknesses:

- No major (full service) grocery store inside of city limits.
- Surrounding land not suitable for agricultural purposes.

6.5.7 Banking and finance

Idanha’s nearest option for banking services is in Mill City. This one-story structure sits along Hwy 22 and could be utilized for emergency financial services during a hazard event. Idanha does not have any financial services within city limits.

Strengths:

- Country stores within city limits provides limited amenities and food supplies.
- Many residents have food storage already in place because of the lack of availability.

Weaknesses:

- No major (full service) grocery store inside of city limits.
- Surrounding land not suitable for agricultural purposes.

6.5.8 Hazardous Materials

The city’s history of manufacturing and logging activities have created concerns around hazardous materials found on abandoned lots. Although only one lot has been identified as a brownfield, many lots contain underground storage tanks that most likely need to be removed for any further development to occur. These tanks could be leeching hazardous materials previously used by local businesses.

Brownfields Location

DEQ ID	Facility Name	Location
2479	Green Veneer & Lumber Mill (assessment recommended)	886 Hwy 22

Strengths:

- There are currently not enough known hazardous materials to cause major concern.
- Brownfield sites could be utilized and attract private sector development.

Weaknesses:

- Current brownfields may be susceptible to leaching of unknown materials.
- Many lots still contain underground storage tanks that are even more susceptible to leaching of hazardous materials.

6.5.9 Emergency Services

Idanha receives emergency service support from the Idanha-Detroit Rural Fire Protection District. Idanha-Detroit Rural Fire Protection District, 107 Hwy 22 NW

Strengths:

Idanha possesses emergency services provided by the Idanha-Detroit RFD within city **limits.**

Weaknesses:

- Idanha lacks any police or medical services.
- Ambulance services must travel from Lyons.
- First responders are very limited to basic life monitoring services.
- Emergency services do not have trained HAM radio operators.

6.5.10 Government Facilities

Idanha City Hall contains the office space for all city services.

- Idanha City Hall, 111 Hwy 22
- Post Office, 103 Hwy 22

Strengths:

- The City Hall facility has bathrooms and could be utilized in an emergency event.

Weaknesses:

- City Hall is small with space already utilized by other services.
- The building lacks any backup generator to power the facility.

6.5.11 Environmental/Historical Preservation Sites

Idanha is surrounded by environmental preservation sites including federal land, state parks and designated wilderness areas. The city is also home to the beginning of the Oregon Pacific Railroad Linear Historic District. Designated in 1999 this 20-mile section of old railroad connects Idanha to the Cascade Range Summit.

Strengths:

- Proximity to pristine state and federal land could attract residents or business.
- Oregon Pacific Railroad Linear Historic District could be utilized to as an emergency trail system.

Weaknesses:

- Idanha lacks any buildings with character that exemplify the historical “timber” identity in the community.

6.5.12 Education

Idanha is part of the Santiam School District. This district encompasses all cities in the Santiam Canyon including Mill City, Gates, and Detroit. This district includes the Santiam Elementary School, and the Santiam Jr./Sr. High School.

- Santiam School District
 - Santiam Elementary School, 450 SW Evergreen St.
 - Santiam JR./SR. High School, 265 SW Evergreen St.

Strengths:

- School facilities could be utilized to shelter a large amount of community residents including functional needs populations.
- School facilities already possess needed infrastructure for a shelter which includes restrooms, showers, and a kitchen.
- School buses could be utilized for transportation after a hazard event.

Weaknesses:

- Idanha is over 25 miles from these school services.
- There are no current agreements or MOUs between the city and school district to utilize facilities after a hazard event.

6.5.13 Healthcare & Public Health

Idanha's nearest medical services is in Mill City which possesses one clinic with limited services. The nearest hospital and full-service health clinic are located in Stayton, Oregon.

- Santiam Medical Clinic, 280 S 1st Ave.

Strengths:

- A clinic with minor services exists within the North Santiam Canyon

Weaknesses:

- The closest health services are located over 20 miles.
- No facilities with major life-saving equipment currently exist within city limits.
- Emergency health supplies are limited to what exists within the community.

6.5.14 Access and Functional Needs

Idanha's vulnerable population consists of the elderly and those that are medically dependent and require life safety equipment. About 22% of Idanha's population is characterized as being elderly, and one legally blind resident resides within city limits.

Strengths:

- Over 55% of residents are over the age of 45, this older populous can volunteer and promote social cohesion in the community.

Weaknesses:

- Full medical services do not exist nearby for an aging population.

6.6 Plans and Policies

Table 6-1, Plans and Policies of the City of Idanha

Document Name	Year
Idanha Comprehensive Plan	2007
Water Plant Emergency Operations Plan	1996
North Santiam Watershed Drought Contingency Plan	2013
Mid-Willamette Valley Council of Governments Comprehensive Economic Development Strategy	2020
Marion County Community Wildfire Protection Plan	2017

6.7 Hazard Profile

Table 6-2, City of Idanha Hazard Profile

Community Overview							
Community Name	Population	# Of Buildings		Critical Facilities ¹	Total Building Value (\$)		
Idanha	155	159		1	35,338,000		
Hazus-MH Analysis Summary							
Hazard	Scenario	Potentially Displaced Residents	% Potentially Displaced Residents	Damaged Buildings	Damaged Critical Facilities	Lost Estimate (\$)	Loss Ratio
Flood ²	1% Annual Chance	3	1.7%	2	0	23,000	0.1%
Earthquake	Mt. Angel Mw 6.8 Deterministic	0	0.1%	1	0	149,000	0.4%
Exposure Analysis Summary							
Hazard	Scenario	Potentially Displaced Residents	% Potentially Displaced Residents	Exposed Buildings	Exposed Critical Facilities	Building Value (\$)	Exposure Ratio
Landslide	High and Very High Susceptibility	28	18%	39	0	9,935,000	28%
Channel Migration	Channel Migration Zone	23	15%	21	0	4,094,000	15%
Wildfire	High and Moderate Risk	79	51%	66	0	13,610,108	39%
Lahar	Medium Zone (1000 to 15000 – Year)	141	91%	127	0	27,525,000	78%
¹ Facilities with multiple buildings were consolidated into one building complex. ² No damage is estimated for exposed structures with “First floor height” above the level of flooding (base flood elevation).							
Critical Facilities							
Critical Facilities by Community	Flood 1% Annual Chance	Earthquake Moderate to Complete Damage	Landslide High and Very High Susceptibility	Channel Migration Zone	Wildfire High or Moderate Risk	Lahar Hazard	
None Reported							

Source: DOGAMI (2022)

6.8 Hazard Analysis

The methodology for assessing risk was the same for all jurisdictions and a detailed description of the BOLD planning methodology can be found in Volume I, a brief description is below. To complete the risk assessment, the jurisdiction representatives first updated the description, type, location, and extent of each hazard. Next, they updated the Hazard Vulnerability Analysis based on each hazard’s potential impact on the community using a calculated priority risk index (CPRI) methodology developed by BOLD Planning⁶. This assessment method ranks the following factors to determine risk from the range of hazards identified:

1. Probability (frequency) of event,
2. Magnitude of event,
3. Expected warning time before event, and
4. Expected duration of event.

Score	Probability	Warning Time	Magnitude/Severity	Duration
4	Highly Likely	Less than 6 hours	Catastrophic	More than 1 week
3	Likely	6-12 hours	Critical	Less than 1 week
2	Possible	12-24 hours	Limited	Less than 1 day
1	Unlikely	24+ hours	Negligible	Less than 6 hours

The assessment identifies three levels of risk: High, Moderate and Low.

High - High probability of occurrence; at least 50 percent or more of population at risk from hazard; significant to catastrophic physical impacts to buildings and infrastructure; major loss or potential loss of functionality to all essential facilities (hospital, police, fire, EOC and shelters).

Moderate - Less than 50 percent of population at risk from hazard; moderate physical impacts to buildings and infrastructure; moderate potential for loss of functionality to essential facilities.

Low - Low probability of occurrence or low threat to population; minor physical impacts.

IMPACT	Range Values	
	Low CPRI	High CPRI
High	3.0	4.0
Moderate	2.0	2.9
Low	1.0	1.9

A summary of the risk assessment findings and rankings is presented below.

Table 6-3, City of Idanha Hazard Vulnerability Assessment – Natural Hazards

Hazard Profile Summary City of Idanha Using BOLD Planning Analysis Scoring						
Non-Natural Hazard	Probability	Warning Time	Magnitude	Duration	CPRI	2022 Local Planning Significance
Weight Factor	0.45	0.15	0.3	0.1		
Wildland Interface Fire	4	4	3	4	3.7	High
Earthquake	3	4	3	4	3.3	High
Severe Weather/Storm	3	1	2	3	2.4	Moderate
Landslide	3	1	2	3	2.4	Moderate
Extreme Weather - High Temperature	3	1	2	3	2.4	Moderate
Tornado	2	4	2	3	2.4	Moderate
Avalanche	2	2	2	3	2.1	Moderate
Drought	2	1	2	4	2.1	Moderate
Flood*	2	1	2	4	2.1	Moderate
Volcanic Eruption	1	1	1	1	1.0	Low

Source: BOLD Planning Risk Assessment Method; Analysis by Marion County Emergency Management and City of Idanha, 10/28/21. *Includes Dam Failures

Table 6-4, Hazard Vulnerability Assessment – Other Hazards

Hazard Profile Summary for the City of Idanha Using BOLD Planning Analysis Scoring						
Non-Natural Hazard	Probability	Warning Time	Magnitude	Duration	CPRI	2022 Local Planning Significance
Weight Factor	0.45	0.15	0.3	0.1		
Hazardous Materials Release - Transportation	4	4	3	4	3.7	High
Other: Bridge capability over N. Santiam River	3	4	4	4	3.6	High
Public Health	4	1	2	4	3.0	High
Chemical, Biological, Radiological, Nuclear, Explosive	1	4	4	4	2.7	Moderate
Fire - Residential / commercial (Arson)	2	4	2	4	2.5	Moderate
Unauthorized Entry	2	4	2	4	2.5	Moderate
Hazardous Materials - Non-Transportation	1	4	2	3	2.0	Moderate
Cyberterrorism	1	4	1	4	1.8	Low
Terrorism/Active Shooter/ Workplace Violence	1	4	1	4	1.8	Low
Agricultural Terrorism	1	1	1	4	1.3	Low

Source: Marion County Emergency Management and City of Idanha, 10/28/21.

6.9 Hazard Characteristics

Hazard History, Characteristics and Extent for Marion County apply also to the City of Idanha. Volume I, Section 2, Risk Assessment, adequately describes the characteristics of natural hazards, as well as the location and extent of potential events. This section identifies vulnerabilities specific to Idanha, recent localized hazard events and impacts, and illustrates the basis for the city's HVA scores.

6.9.1 Avalanche

CPRI = 2.3, Risk Level: Moderate

Events: n/a

Vulnerability: none

6.9.2 Drought

CPRI = 2.2, Risk Level: Moderate

Events: 2021 was very dry, but no water use restrictions.

Vulnerability: Water supply from Rainbow Lake could be affected.

6.9.3 Earthquake

CPRI = 3.6, Risk Level: High

Events n/a

Vulnerability: Losing bridge and road system lifelines is primary concern.

6.9.4 Extreme Heat

CPRI = 2.8, Risk Level: Moderate

Events: 2021 was very hot (~105 degrees) for several weeks.

Vulnerability: Older community members are at risk; increased wildfire risk.

6.9.5 Flood

CPRI = 2.1, Risk Level: Moderate

Events: n/a; 1996 a portion of the road washed away.

Vulnerability: Losing bridge and road system lifelines is primary concern.

6.9.6 Landslide

CPRI = 3.2, Risk Level: High

Events: n/a

Vulnerability: Losing bridge and road system lifelines is primary concern.

6.9.7 Severe Weather

CPRI = 3.4, Risk Level: High

Events: Dec. 2021 Snow event— a lot of snow fast.

Vulnerability: n/a

6.9.8 Tornado

CPRI = 2.7, Risk Level: Moderate

Events: n/a

Vulnerability: none

6.9.9 Wildfire

CPRI = 4.0, Risk Level: High

Events: Sept. 8, 2020, wildfire

Vulnerability: Evacuation through wildfire conditions; risk of wildfire in the community; power outage; individual citizen preparedness. The communities of Detroit, Idanha, Gates, Mill and City have the highest percentage of exposure to high and moderate wildfire hazard within the study area.

6.9.10 Volcano

CPRI = 1.9, Risk Level: Low

Events: n/a

Vulnerability: Risk of ashfall and lahar flow. The communities most threatened from a volcanic eruption and lahar event are Gates, Detroit, Idanha, and Mill City.

6.10 Mitigation Strategy

During the 2022 Marion County Hazard Mitigation Plan and the City of Idanha Addendum update process, Oregon Department of Land Conservation & Development and Idanha developed a list of priority actions. These actions were prioritized and then reviewed internally by staff and city council during the spring of 2022.

6.10.1 Mitigation Successes

- The city has improved their water system resilience by installing a new plant and water lines.

6.10.2 Ongoing Mitigation Actions

- City sends out a CCR report annually that advises on steps to conserve water; City uses water bills to communicate.
- Promote Great Oregon Shakeout Awareness month in October. Participate in activities for schools, business, and industry.
- Conduct leak detection surveys for the water system to increase efficiency and prevent further water loss.

6.10.3 City of Idanha Mitigation Action Tables

The following pages include the city's Priority Action Items (Table 6.5), and Action Item Status Report (Table 6.6).

- Following the 2020 wildfires, the City of Idanha has limited capacity for the implementation of mitigation actions as they are focused on rebuilding and recovery. This list are the highest priority items that staff are aware of, some of which are outside of their authority, but critical to life in the Upper Santiam Canyon.

Table 6-5, City of Idanha 2022 Mitigation Action Table

#	Hazard	Mitigation Action	Priority	Timeline	Cost	Description	Status
2022-MH-1	Multi-Hazard	Purchase a diesel generator for City Hall.	H	2-5 Years	\$50-75k	City Hall is the Idanha EOC.	Started
2022-MH-2	Multi-Hazard	Retrofit or replace Church St. bridge to ensure its structural integrity in case of a hazard event	H	5-10 Years	\$2-20 million	Bridge holds the new water lines and goes across the N. Santiam River.	New
2022-MH-3	Multi-Hazard	Collaborate with Marion County to develop a resilient regional sewer system.	H	2-10 Years	Staff time	No sewer service in Idanha in 2022. Funding: grants secured by Marion County/ N. Santiam Sewer Authority	Started/ Revised
2022-MH-4	Multi-Hazard	Coordinate with Marion County on evacuation planning and education.	H	0-18 Months	Staff time		New
2022-WF-1	Wildfire	Collaborate with Detroit Ranger District, ODF, and BLM to conduct fuel hazard reduction along the Wildland Urban interface and Hwy 22. *	M	1-5 Years	TBD	Firewise activities were underway prior to 2020 fires. These action items are not needed in 2022 due to the recent wildfires eliminating fuel.	Future Priority Action
2022-WF-2	Wildfire	Collaborate with ODF and Idanha-Detroit RFD to develop strategic community fuel breaks. *	M	1-5 Years	TBD	These action items are not needed in 2022 due to the recent wildfires eliminating fuel.	Future Priority Action

Source: City of Idanha, 3/31/

Table 6-6, City of Idanha, 2017 Action Items Status Report

#	Hazard	Mitigation Action	Description	Coordinating Organization	Status
2017-P-1	Multi-Hazard	Update planning documents (comprehensive plan, development code) to reflect new hazard information.	Funding: general fund	City of Idanha	Not Started
2017-P-2	Multi-Hazard	City staff should assess the amount of KWH needed to run city facilities. City staff should purchase a diesel generator with additional storage accordingly.	Have a generator at the water plant; had two weeks of fuel during 2020 fires. Bought a pickup truck with a diesel pump in the back of it. No backup power for city hall. Funding: general fund, MWCOG grants/loans	City of Idanha	Started
2017-MH-1	Multi-Hazard	Develop an Energy Assurance Plan.		City of Idanha	Discontinue
2017-MH-2	Multi-Hazard	Assess the short and long term needs for sheltering access and functional needs populations for all hazards.	Identify an assembly location in Idanha and secure a generator for this site.	City of Idanha	Not started
2017MH-3	Multi-Hazard	Establish a strategic plan to utilize community resident amenities. (Hill brothers) – Kubota Tractor, Skidder		City of Idanha	Discontinued
2017MH-4	Multi-Hazard	Establish an Idanha CERT team.		City of Idanha	Discontinued
2017-MH-5	Multi-Hazard	Develop a community education program, such as an all-hazard community outreach forum for students and residents. (From CWPP)	Support the Fire Dept in conducting community outreach on hazards.	City of Idanha	Started
2017-MH-6	Multi-Hazard	Expand auxiliary radio capabilities by developing a team of HAM Radio operators for EMS and interested public.	Improve emergency communications through the purchase of equipment and the development of plans (communication, evacuation, emergency, etc.) and trainings such as ICS/NIMS.	City of Idanha	Not started
2017-DR-1	Drought	Monitor economic impacts of drought on recreation, tourism, and agriculture communities.	Detroit Lake is the primary source of tourism in the area.	City of Idanha	Discontinued

#	Hazard	Mitigation Action	Description	Coordinating Organization	Status
2017-DR-2	Hazard Drought	Collaborate with NSWC to complete WMCP's and improve community understanding of water usage and opportunities to increase efficiencies. **	City sends out a CCR report annually that advises on steps to conserve water; City uses water bills to communicate.	City of Idanha	Ongoing
2017-DR-3	Drought	Conduct leak detection surveys for the water system to increase efficiency and prevent further water loss. **	City just ordered a leak tester.	City of Idanha	Ongoing
2017-DR-4	Drought	Develop water storage tanks to hold treated water for municipal use.	City has a holding tank and is gravity fed. System held up great during the fire.	City of Idanha	Complete
2017-MH-7	Multi-Hazard	Collaborate with local residents and NSWC to mitigate risks from the Idanha revetment/floodplain project.		City of Idanha	Discontinued
2017-MH-8	Multi-Hazard	Conduct a fatigue test on Church St. bridge to ensure its structural integrity in case of a hazard event	ODOT tests this bridge annually and it is city owned and a very old, important bridge.	City of Idanha	Ongoing
2017-MH-9	Multi-Hazard	Designate evacuation routes outside of Hwy 22 for EMS.	There is only one route out, east or west.	City of Idanha	Discontinued
2017-MH-10	Multi-Hazard	Collaborate with Marion County to connect to a more resilient regional water/sewer system.	There is only one route out, east or west.	City of Idanha	Discontinued
2017-MH-11	Multi-Hazard	Gather community support for the installation of resilient fiber communication infrastructure throughout the community. ***	Working with N. Santiam Sewer Authority to develop a sewer system for Idanha/Detroit/Gates/Mill City. Starting in 2021, Idanha has good internet via underground cable.	City of Idanha/ N. Santiam Sewer Authority	Started
				City of Idanha	Complete
2017-EQ-1	Earthquake	Promote Great Oregon Shakeout Awareness month in October. Participate in activities for schools, business, and industry.			
2017-EQ-2	Earthquake	Collaborate with GROW EDC to develop relevant public-private partnerships with businesses that can contribute to response and recovery.			
2017-WF-1	Wildfire	Collaborate with USFS, BLM, and ODF to conduct fuel hazard reduction along the Wildland Urban Interface (WUI) and Hwy. 22	Firewise activities were underway prior to 2020 Wildfires; not needed now, as vegetation is just coming back.	City of Idanha	Continue
2017-WF-2	Wildfire	Collaborate with ODF and Idanha-Detroit Fire Dist., to develop strategic community fuel breaks. *		City of Idanha	Started

#	Hazard	Mitigation Action	Description	Coordinating Organization	Status
2017-LS-1	Landslide	Integrate new DOGAMI landslide hazard information into land use zoning/development codes.	There is a new DOGAMI study underway. No concern in city limits, just for lifelines.	City of Idanha	Not Started
2017-FL-1	Flood	Widen the North Santiam River and reassess the dike		City of Idanha	Discontinue

Source: City of Idanha, 3/31/22

* Identified in Marion County Community Wildfire Protection Plan (Action Plan & Priorities)

**Identified in North Santiam Watershed Drought Contingency Plan (Priority Drought Mitigation Actions)

***Identified in Mid-Willamette Valley Council of Governments Comprehensive Economic Development Study (Appendix C)

7 City of Jefferson Addendum

7.1 Purpose

This document serves as the City of Jefferson’s Addendum to the Marion County Multi-Jurisdictional Hazards Mitigation Plan (MHMP, HMP). The purpose of this addendum is to guide the implementation of mitigation actions by The City of Jefferson to improve the resilience of the community. Please note that mitigation planning is a long-term endeavor— one that requires broad internal involvement and community engagement to be successful. Finally, please refer to the information contained in Volume I (Basic Plan) and Volume III (Appendices) of this HMP, which provides additional information (particularly regarding participation and mitigation strategy) and forms the basis of this addendum.

7.2 Plan Process, Participation, and Adoption

In 2021 and early 2022, Marion County partnered with the Oregon Department of Land Conservation and Development (DLCD) and the Oregon Department of Emergency Management (OEM), and Marion County cities, including the City of Jefferson, to update their addendum to the Marion County Hazard Mitigation Plan, which expired August 16, 2022.

By developing this addendum to the Marion County HMP, locally adopting it, and having it approved by FEMA, the City of Jefferson will gain eligibility for FEMA Hazard Mitigation Assistance (HMA) funding that includes three programs: Building Resilient Infrastructure & Communities (BRIC), formerly the Pre-Disaster Mitigation grant program, Hazard Mitigation Grant Program (HMGP), and the Flood Mitigation Assistance (FMA) grant program funds.

This project is funded through the Federal Emergency Management Agency’s (FEMA) FY19 Pre-Disaster Mitigation Competitive Grant Program (PDMC-PL-10-OR-2019-003).

The City of Jefferson joined the Marion County HMP update by executing an intergovernmental agreement with DLCD on September 24, 2021. On September 30, 2021, City of Jefferson’s City Manager and Recorder, Sarah Cook, City of Jefferson’s Utility Foreman, Kyle Ward, Marion County Emergency Manager Kathleen Silva, and DLCD Planner Tricia Sears conducted a risk assessment meeting with City of Jefferson staff that included a Hazard Vulnerability Assessment ranking. City staff met again with DLCD on April 11, 2022, to develop this addendum.

City of Jefferson staff attended HMP Steering Committee meetings on September 7, 2021, October 5, 2021, and December 7, 2021. The city promoted the HMP survey and outreach efforts throughout the plan update, including public posts on the city’s Facebook page on January 20, 2022, to distribute the plan update public survey to interested parties in the City of Jefferson.

7.3 Risk Assessment

A risk assessment is intended to provide the “factual basis for activities proposed in the strategy to reduce losses from identified hazards” (Department of Homeland Security, Federal Emergency Management Agency, 2023). This section of the HMP addendum can serve as the factual basis for addressing Oregon Statewide Planning Goal 7 – Areas Subject to Natural Hazards.

7.4 Community Profile

This section provides information on city specific assets and populations. For additional information on the characteristics of City of Jefferson, in terms of geography, environment, population, demographics, employment and economics, as well as housing and transportation see Volume III, Appendix B, Community Profile. Many of these community characteristics can affect how hazards impact communities and how communities choose to plan for hazard mitigation. Considering the city specific assets during the planning process can assist in identifying appropriate measures for hazard mitigation.

7.4.1 Community Characteristics

The City of Jefferson is a middle- to low-income community located in the Willamette Valley in Marion County, Oregon, commuting distance to Albany and Salem.

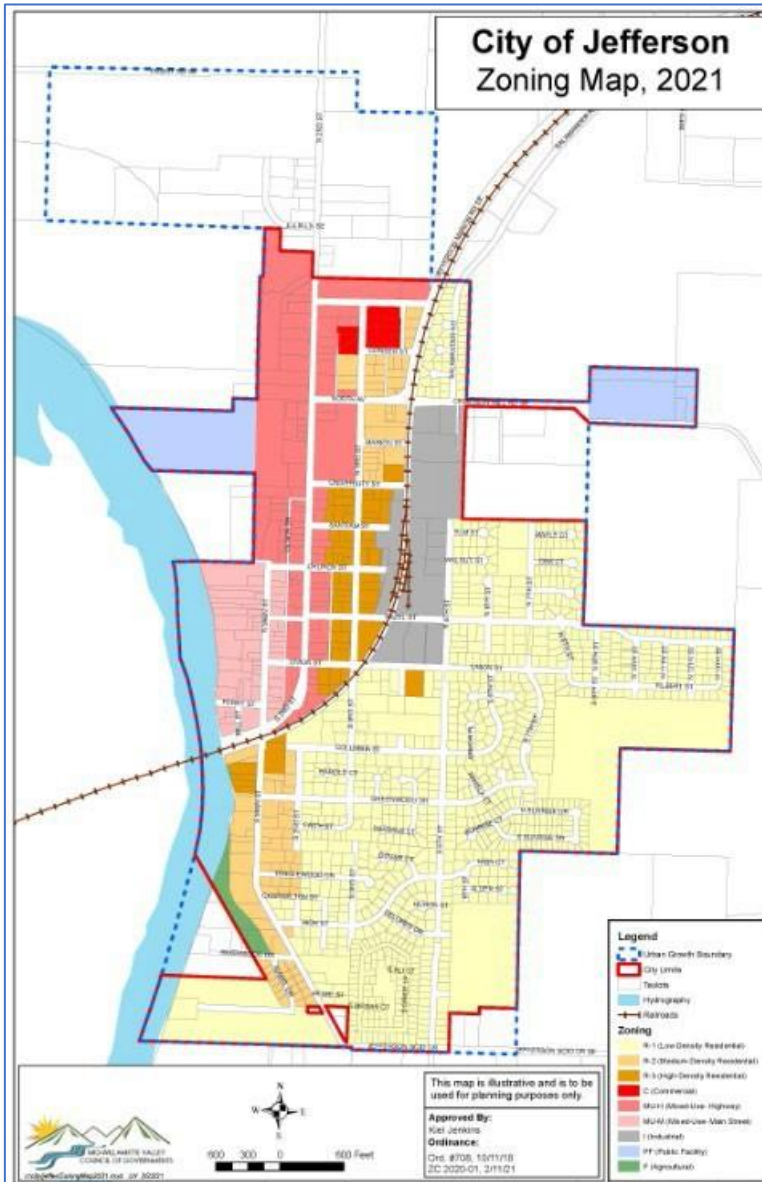
The largest employer in Jefferson is the school district. There is a significant Hispanic, non- English speaking population Jefferson, first known as Conser’s Ferry, was informally established in 1851. It is situated on the north bank of the Santiam River, one mile below the junction of the north and south forks of the river, and nine miles above the confluence with the Willamette River.

When Jacob Conser moved to what is now Jefferson, the only road through the area was a wagon trail to Santiam City, a community that would later be washed away during the flood of 1861. Conser built his ferry over the Santiam in 1851. Later, he would build a sawmill, an education center, and a flour and grist mill all in Jefferson. Jacob Conser went on to become a state legislator and later, a noted Marion County Judge.

Jacob Conser built the Conser House in 1854 as his home and as a hotel. It was the first framed building in Jefferson. Many notables stayed there including General Phil Sheridan and Ben Holiday, a noted railroad builder. It later housed Jefferson City Hall as well as the Jefferson Public Library and today is listed on the national register of historic buildings.

The Jefferson municipal government was incorporated on October 20, 1870. As of the 2020 U.S. Census, there are 3,329 people residing in the city (Portland State University, Population Research Center, 2021).

Figure 7-1, City of Jefferson Zoning Map



7.5 Critical and Important Facilities

City of Jefferson's critical and important facilities include the following:

7.5.1 Transportation

Road	Owner	Notes
OR 164	ODOT	Enters city from the southwest and travels north along the western side of the city.
Railroad	Union Pacific	Operated by Union Pacific and Amtrak

Railroad: Rail split community in half. Rail incidents can block vehicle transportation within the city for hours. Should there be an emergency on the southeast side of town during a rail incident, citizens would rely on the City of Scio for response.

Bridge: Hwy Or 164 (Conser Bridge) on the south end of town. ODOT is due to begin upgrade or maintenance work on bridge in 2022. A trunk sewer line runs under the bridge; there may also be utilities of concern such as phone lines or fiber optic cable.

7.5.2 Energy

Electricity: Pacific Power

Gasoline and Diesel: The Town Pump is the local gas station. There is no town owned fuel storage. It is town policy to refuel vehicles if <3/4 full.

7.5.3 Water/ Wastewater

Water: A new water treatment plant has recently come online. The old plant is still operational and was constructed in 1988, Water is drawn from the South Santiam.

The city has a 1.75-million-gallon reservoir. Assuming winter consumption of 200k-300k gal/day, the supply would last 7 days. In the summer at 400k-600k gal/day the supply would last 3 days. All residents use city water although some properties use wells for irrigation.

The water treatment plan can treat 2 million gallons each day. The facility is equipped with a diesel-powered backup generator and is fueled on call by Carson Oil.

Wastewater: The new wastewater treatment plant was completed in 2010. The facility has a diesel generator that could run 24/7 for 6-7 days. The system is all gravity fed.

7.5.4 Emergency Services

Fire: Jefferson Fire District maintains two stations serving Jefferson and Millersburg.
Police: Law Enforcement contract with Marion County.

Public Works: Three staff members operate and maintain the systems (700 N 2nd Street)
EOC: No location has been identified within the City of Jefferson

7.5.5 City Hall:

This facility is equipped with a backup gasoline powered generator but is sufficient only to power half the building. The city uses internet-based phones. (150 N. 2nd)

7.5.6 Schools

The schools are in unincorporated Marion County. The Middle School is new, and the Elementary School was seismically retrofitted.

7.5.7 Communication

Cell service: AT&T and Verizon have cell towers on the hill where water reservoir site is located.

7.5.8 Cultural/Historical Resources

The city owns the historic Jacob Conser house located at 114 N Main Street (also listed as 128 N. 28th Street)

Events Festivals: The Mint festival ran in July on a Saturday. It is put on by volunteers as Jefferson was at one time the “mint capitol of the world”. The National Night Out: 1st Tuesday in August is an event at City Hall and has expanded into the downtown.

7.5.9 Functional and Access Needs (Vulnerable Populations)

Jefferson has a significant non-English speaking population.

7.5.10 Community Facilities

Jefferson Community Center is a privately owned center. They coordinate some events; have a kitchen, restrooms, and a large multipurpose room.

An Elementary School that includes a gym is in Jefferson.

See hazard sections below for potential hazard-related vulnerabilities to these facilities.

7.6 Plans and Policies

Table 7-1, Plans and Policies of the City of Jefferson

Document Name with Hyperlink if the document is available online	Year
Comprehensive Plan Transportation System Plan	Most recently amended 7/2022
Strategic Plan	2018, updated in 2021

7.7 Hazard Profile

Table 7.2, City of Jefferson hazard profile

Community Overview							
Community Name	Population	# Of Buildings	Critical Facilities ¹	Total Building Value (\$)			
Jefferson	3,280	1,243	2	389,441,000			
Hazus-MH Analysis Summary							
Hazard	Scenario	Potentially Displaced Residents	% Potentially Displaced Residents	Damaged Buildings	Damaged Critical Facilities	Lost Estimate (\$)	Loss Ratio
Flood ²	1% Annual Chance	5	0.1%	2	0	8,000	0.0%
Earthquake	Mt. Angel Mw 6.8 Deterministic	2	0.1%	12	0	3,211,000	0.8%
Exposure Analysis Summary							
Hazard	Scenario	Potentially Displaced Residents	% Potentially Displaced Residents	Exposed Buildings	Exposed Critical Facilities	Building Value (\$)	Exposure Ratio
Landslide	High and Very High Susceptibility	0	0.0%	0	0	0	0.0%
Channel Migration	Channel Migration Zone	62	1.9%	25	0	8,146,000	2.1%
Wildfire	High and Moderate Risk	15	0.5%	4	0	1,626,000	0.4%
Lahar	Medium Zone (1000 to 15000 – Year)	0	0%	0	0	0	0%
¹ Facilities with multiple buildings were consolidated into one building complex. ² No damage is estimated for exposed structures with “First floor height” above the level of flooding (base flood elevation).							
Critical Facilities							
Critical Facilities by Community	Flood 1% Annual Chance	Earthquake Moderate to Complete Damage	Landslide High and Very High Susceptibility	Channel Migration Zone	Wildfire High or Moderate Risk	Lahar Hazard	
Jefferson Elementary	0	0%	0	0	0	0%	
Jefferson Fire Dist. Main Station	0	0%	0	0	0	0%	

Source: DOGAMI (2022)

7.8 Hazard Analysis

The methodology for assessing risk was the same for all jurisdictions and a detailed description of the BOLD planning methodology can be found in Volume I, a brief description is below. To complete the risk assessment, the jurisdiction representatives first updated the description, type, location, and extent of each hazard. Next, they updated the Hazard Vulnerability Analysis based on each hazard’s potential impact on the community using a calculated priority risk index (CPRI) methodology developed by BOLD Planning. This assessment method ranks the following factors to determine risk from the range of hazards identified:

1. Probability (frequency) of event,
2. Magnitude of event,
3. Expected warning time before event, and
4. Expected duration of event.

The assessment identifies three levels of risk: High, Moderate and Low.

High - High probability of occurrence; at least 50 percent or more of population at risk from hazard; significant to catastrophic physical impacts to buildings and infrastructure; major loss or potential loss of functionality to all essential facilities (hospital, police, fire, EOC and shelters).

Moderate - Less than 50 percent of population at risk from hazard; moderate physical impacts to buildings and infrastructure; moderate potential for loss of functionality to essential facilities.

Low - Low probability of occurrence or low threat to population; minor physical impacts.

IMPACT	Range Values	
	Low CPRI	High CPRI
High	3.0	4.0
Moderate	2.0	2.9
Low	1.0	1.9

A summary of the risk assessment findings and rankings is presented below

Table 7-2, City of Jefferson Hazard Vulnerability Assessment – Natural Hazards

Hazard Profile Summary City of Jefferson Using BOLD Planning Analysis Scoring						
Non-Natural Hazard	Probability	Warning Time	Magnitude	Duration	CPRI	2022 Local Planning Significance
Weight Factor	0.45	0.15	0.3	0.1		
Earthquake	3	4	4	4	3.6	High
Flood*	2	1	3	4	2.4	Moderate
Extreme Weather - High Temperature	2	1	2	3	2.0	Moderate
Severe Weather/Storm	2	1	2	3	2.0	Moderate
Wildland Interface Fire	2	1	2	3	2.0	Moderate
Tornado**	1	3	2	1	1.6	Low
Volcanic Eruption	1	1	2	3	1.5	Low
Avalanche***	1	1	1	1	1.0	Low
Drought	1	1	1	1	1.0	Low
Landslide	1	1	1	1	1.0	Low

Source: BOLD Planning Risk Assessment Method; Analysis by Marion County Emergency Management and City of Jefferson staff on September 30, 2021. *Including dam failures; **Split out of Severe Weather in 2021; ***New in 2021

Table 7-3. City of Jefferson Hazard Vulnerability Assessment – Other Hazards

Hazard Profile Summary for the City of Jefferson Using BOLD Planning Analysis Scoring						
Non-Natural Hazard	Probability	Warning Time	Magnitude	Duration	CPRI	2022 Local Planning Significance
Weight Factor	0.45	0.15	0.3	0.1		
Terrorism/Active Shooter/Workplace Violence	2	4	4	4	3.1	High
Chemical, Biological, Radiological, Nuclear, Explosive (CBRNE)	2	4	2	4	2.5	Moderate
Cyberterrorism	2	4	2	4	2.5	Moderate
Fire - Residential / commercial (Arson)	2	4	2	4	2.5	Moderate
Hazardous Materials Release - Transportation	2	4	2	4	2.5	Moderate
Public Health	3	1	2	4	2.5	Moderate
Hazardous Materials - Non-Transportation	2	4	2	3	2.4	Moderate
Unauthorized Entry	2	4	2	3	2.4	Moderate
Agricultural Terrorism	2	1	2	4	2.1	Moderate

Source: Marion County Emergency Management and City of Jefferson staff on September 30, 2021.

7.9 Hazard Characteristics

Hazard History, Characteristics and Extent for Marion County apply also to the City of Jefferson. Volume I, Section 2, *Risk Assessment*, adequately describes the characteristics of natural hazards, as well as the location and extent of potential events. This section identifies vulnerabilities specific to the City of Jefferson, recent localized hazard events and impacts, and illustrates the basis for the city's HVA scores.

7.9.1 Avalanche

CPRI = 1.0, Risk Level: Low

Events: None during the effective period of the prior plan.

Vulnerability: Low. The location of Jefferson does not include mountainous areas.

7.9.2 Drought

CPRI = 1.0, Risk Level: Low

Events: Due to a cool, wet climate, past and present weather conditions have generally spared Marion County communities from the effects of drought; however, Marion County was included in Presidential Drought Declarations in 1992 and 2015.

Vulnerability: Low. The city utilizes surface water from the North Santiam as it's drinking water source. The draught location is after the confluence with the S. Santiam and the city's water rights are old providing access to this source above younger water right holders. The city can draw around 2 million gallons from the river. Additional, drought-related community impacts are described within the county's Drought Hazard Annex.

7.9.3 Earthquake

CPRI = 3.6, Risk Level: High

Events: The 1993 Scott Mills quake caused \$28 million in damages to cities throughout Marion County. No damaging earthquake events have occurred during the five-year effective period of the prior plan update.

Vulnerability: Turner is about one mile from several active faults: a string of faults run to both the north and south of Turner.

Jefferson's probability for an earthquake event is "likely" and vulnerability to an earthquake event is "catastrophic". The assessment of risk did not differentiate between Cascadia Subduction Zone and crustal events as mitigation does not differ substantially.

Earthquake-induced damages are difficult to predict, and depend on the size, type, and location of the earthquake, as well as site-specific building and soil characteristics. Presently, it is not possible to accurately forecast the location or size of earthquakes, but it is possible to predict the behavior of soil at any site. In many major earthquakes, damages have primarily been caused by the behavior of the soil. Figure 7-2 shows that ground shaking in Jefferson for both crustal and subduction earthquakes are expected to be very strong, with some nearby areas experiencing severe shaking.

The Jefferson steering committee identified earthquake damage to homes and the historic bridge that is important to evacuation routes as primary concerns. Transportation isolation due to bridge failure could have a significant impact on the city. The City's priority actions reflect these concerns.

7.9.4 Extreme Heat

CPRI = 2.0, Risk Level: Moderate

Events: June 26-28, 2021, and August 11-12, 2021, saw temperatures over 100 degrees in Jefferson.

Vulnerability: The city identified and stood up cooling centers and made water available during that recent event.

7.9.5 Flood

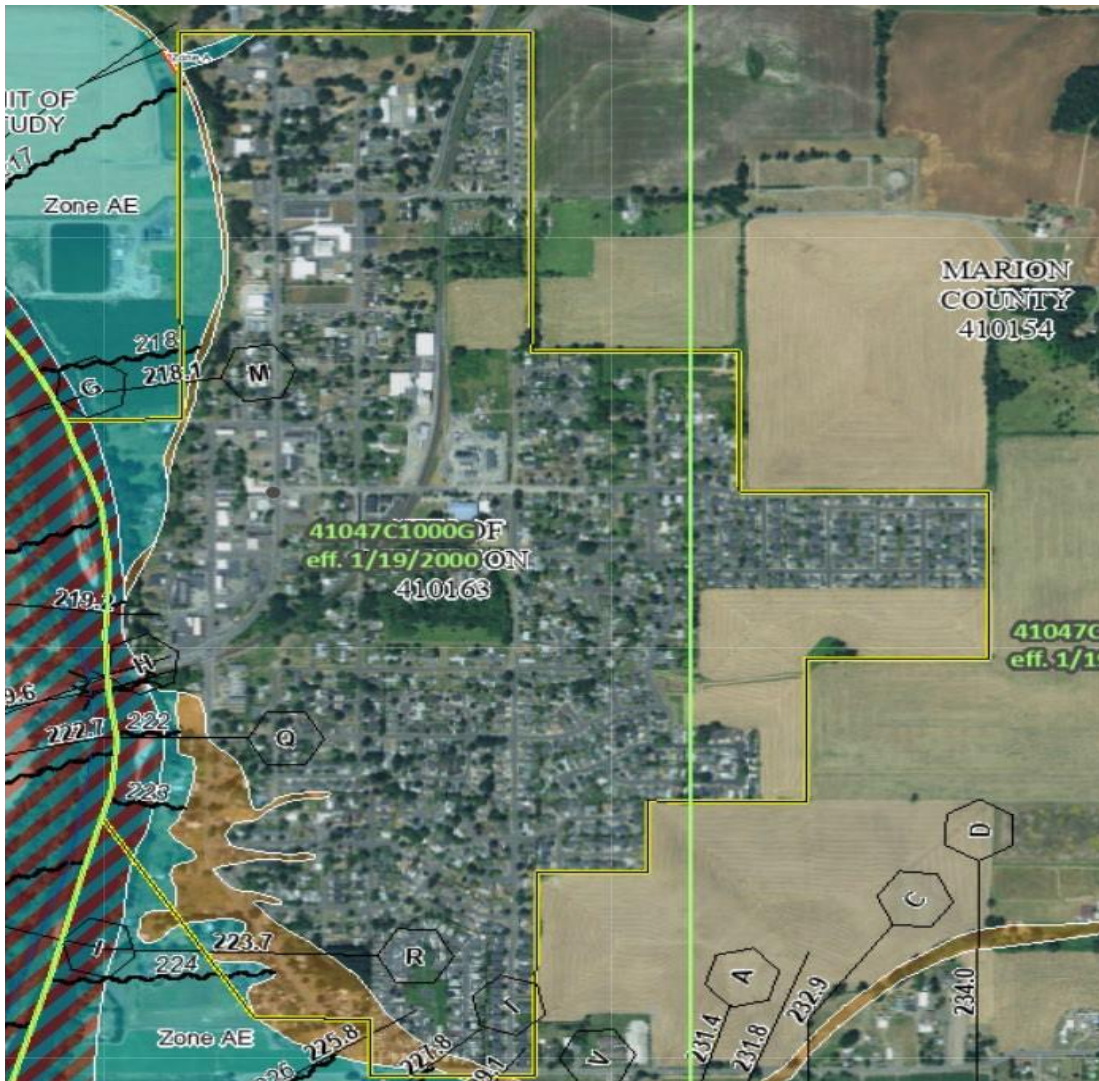
CPRI = 2.4, Risk Level: Moderate

Events: On December 20-21, 2020, a series of strong Pacific fronts moved across the region bringing high winds to the coast with heavy rain across much of the area. The gage on the Santiam River at Jefferson (JFFO3) crested at 15.3 feet. Flood stage is 15.0 feet. No damage was reported.

On April 8-9, 2019, a particularly strong atmospheric river took aim for the south Willamette Valley, sitting over areas south of Salem for two days, producing anywhere from 2.5 to 5 inches of rain over a 48-hour period. The Santiam River at Jefferson crested at 15.8 feet around 11 PM on April 8th, which is 0.8 foot above flood stage.

Vulnerability: High. The city ranked the magnitude of a flood event as "critical" with the duration lasting more than a week. The location of the city adjacent to the North Santiam poses flood risk as shown in the FEMA Special Flood Hazard Area map.

Figure 7-2, FEMA Special Flood Hazard Area map for Jefferson



7.9.6 Landslide

CPRI = 2.4, Risk Level: Moderate

Events: n/a

Vulnerability: Jefferson has a relatively flat topography, therefore the probability for landslide is unlikely and their vulnerability to landslides is limited.

7.9.7 Severe Weather

CPRI = 2.0, Risk Level: Moderate

Windstorm

Because windstorms typically occur during winter months, they are sometimes accompanied by ice, freezing rain, flooding, and very rarely, snow.

Winter Storm (Snow/Ice)

Severe winter storms can consist of rain, freezing rain, ice, snow, cold temperatures, and wind. They originate from troughs of low pressure offshore that ride along the jet stream during fall, winter, and early spring months. Severe winter storms affecting the city typically originate in the Gulf of Alaska or in the central Pacific Ocean. These storms are most common from November through March.

Major winter storms can and have occurred in Jefferson, and while they typically do not cause significant damage, they are frequent and have the potential to impact economic activity. The most recent winter storms (December 2016 through January 2017 and February 2021) included snow and freezing rain and ice, transportation and power interruptions, loss of all internet service, loss of all cellular phone service and government office and school closures.

Vulnerability: Jefferson City representatives ranked the city’s probability for Severe Weather as “possible” and vulnerability to windstorm as “critical”.

7.9.8 Tornado

CPRI = 1.6, Risk Level: Low

Events: None during the effective period of the prior plan update.

Vulnerability: Risk of damage to buildings, power outages, and road closures.

7.9.9 Wildfire

CPRI = 2.0, Risk Level: Moderate

Events: Jefferson is surrounded on all sides by open farmland, forests, or waterways. Although Jefferson has some forested areas within the city limits the impact of the 2020 wildfires was predominantly smoke.

Vulnerability: The county updated the Community Wildfire Protection Plan (CWPP) in 2016 and portions of Jefferson are listed as having wildland urban interface (WUI). Areas of concern are north of the city. The community is aware of and concerned about creating and maintaining defensible space.

7.9.10 Volcano

CPRI = 1.5, Risk Level: Low

Events: n/a

Vulnerability: Ashfall only

7.10 Mitigation Strategy

During the 2022 Marion County Hazard Mitigation Plan and Jurisdiction Addendum update process, Oregon Department of Land Conservation & Development and Jurisdiction developed a list of priority actions. These actions were prioritized and then reviewed internally by staff and city council during the spring of 2022.

7.10.1 City of Jefferson Mitigation Action Tables

The following pages includes the city's initial Priority Action Items (Table 7.4)

Table 7-4, City of Jefferson Priority Action Items

#	Hazard	Mitigation Action	Priority	Timeline	Cost	Description	Status
2022-MH-1	Multi-Hazard	Public education on preparations to be able to shelter in place.	H	1-3 Years	TBD	Because the city does not have control over repairs to the bridges that link the city with the outside, public information about how to be prepared for sheltering in place is an action the city can take to reduce risk to its citizens. Methods for doing this might include developing flyers to include in water bill, Facebook posts, and Nixle notification.	Not Started
2022-MH-2	Multi-Hazard	Public outreach to encourage sign up for Nixle notifications	H	1-3 Years	TBD	Nixle is an efficient way to communicate with the residents of the city. Citizens do have to opt in to the system and this effort would seek to increase the ability of the city to communicate with its citizens during an emergency.	Not Started
2022-MH-3	Multi-Hazard	Develop an agreement with the Elementary School District or Community Center (private) to allow the city to use the facilities for respite or shelter.	H	1-3 Years	TBD	The community center opened up to the public to provide respite from recent high heat events when asked by the city. The elementary school may also be a location for sheltering or respite. No formal agreement is in place currently and preparations or equipment needed to provide respite or shelter could be included in this agreement.	Not Started

Source: City of Jurisdiction HMP Steering Committee, April 11, 2022

8 City of Keizer Addendum

8.1 Purpose

This document serves as the City of Keizer’s Addendum to the Marion County Multi-Jurisdictional Hazards Mitigation Plan (MHMP, HMP). The purpose of this addendum is to guide the implementation of mitigation actions by the City of Keizer to improve the resilience of the community. Please note that mitigation planning is a long-term endeavor— one that requires broad internal involvement and community engagement to be successful. Finally, please refer to the information contained in Volume I (Basic Plan) and Volume III (Appendices) of this HMP, which provides additional information (particularly regarding participation and mitigation strategy) and forms the basis of this addendum.

8.2 Plan Process, Participation, and Adoption

In 2021 and early 2022 Marion County partnered with the Oregon Department of Land Conservation and Development and the Oregon Department of Emergency Management (OEM), and Marion County cities, including Keizer, to update their addendum to the Marion County HMP, which expired August 16, 2022.

By developing this addendum to the Marion County HMP, locally adopting it, and having it approved by FEMA, the City of Keizer will regain eligibility for FEMA Hazard Mitigation, Pre- Disaster Mitigation, and Flood Mitigation Assistance grant program funds. This project is funded through the Federal Emergency Management Agency’s (FEMA) FY19 Pre-Disaster Mitigation Competitive Grant Program (PDMC-PL-10-OR-2019-003).

The City of Keizer joined the Marion County HMP update by executing an intergovernmental agreement with DLCD in December 7, 2021. On September 27, 2021, City of Keizer Project Manager Matt Reyes, Marion County Emergency Preparedness Coordinator Mike Hintz, Marion County Emergency Manager Kathleen Silva and DLCD Planner Tricia Sears conducted a risk assessment meeting with the Jurisdiction that included a Hazard Vulnerability Assessment ranking. City staff met again with DLCD on April 8, 2022, to update this addendum.

City of Keizer staff attended HMP Steering Committee meetings on August 3, 2021, September 7, 2021, and May 4, 2022, and promoted the HMP survey and outreach efforts throughout the plan update, including public posts on the Keizer Fire District Facebook page to distribute the plan update public survey to interested parties in the Jurisdiction service area.

8.3 Risk Assessment

A risk assessment is intended to provide the “factual basis for activities proposed in the strategy to reduce losses from identified hazards.”¹ This section of the HMP addendum can serve as the factual basis for addressing Oregon Statewide Planning Goal 7 – Areas Subject to Natural Hazards.

8.4 Community Profile

This section provides information on city specific assets. For additional information on the characteristics of the City of Keizer, in terms of geography, environment, population, demographics, employment and economics, as well as housing and transportation see Volume III, Appendix B, *Community Profile*. Many of these community characteristics can affect how natural hazards impact communities and how communities choose to plan for natural hazard mitigation. Considering the city specific assets during the planning process can assist in identifying appropriate measures for natural hazard mitigation.

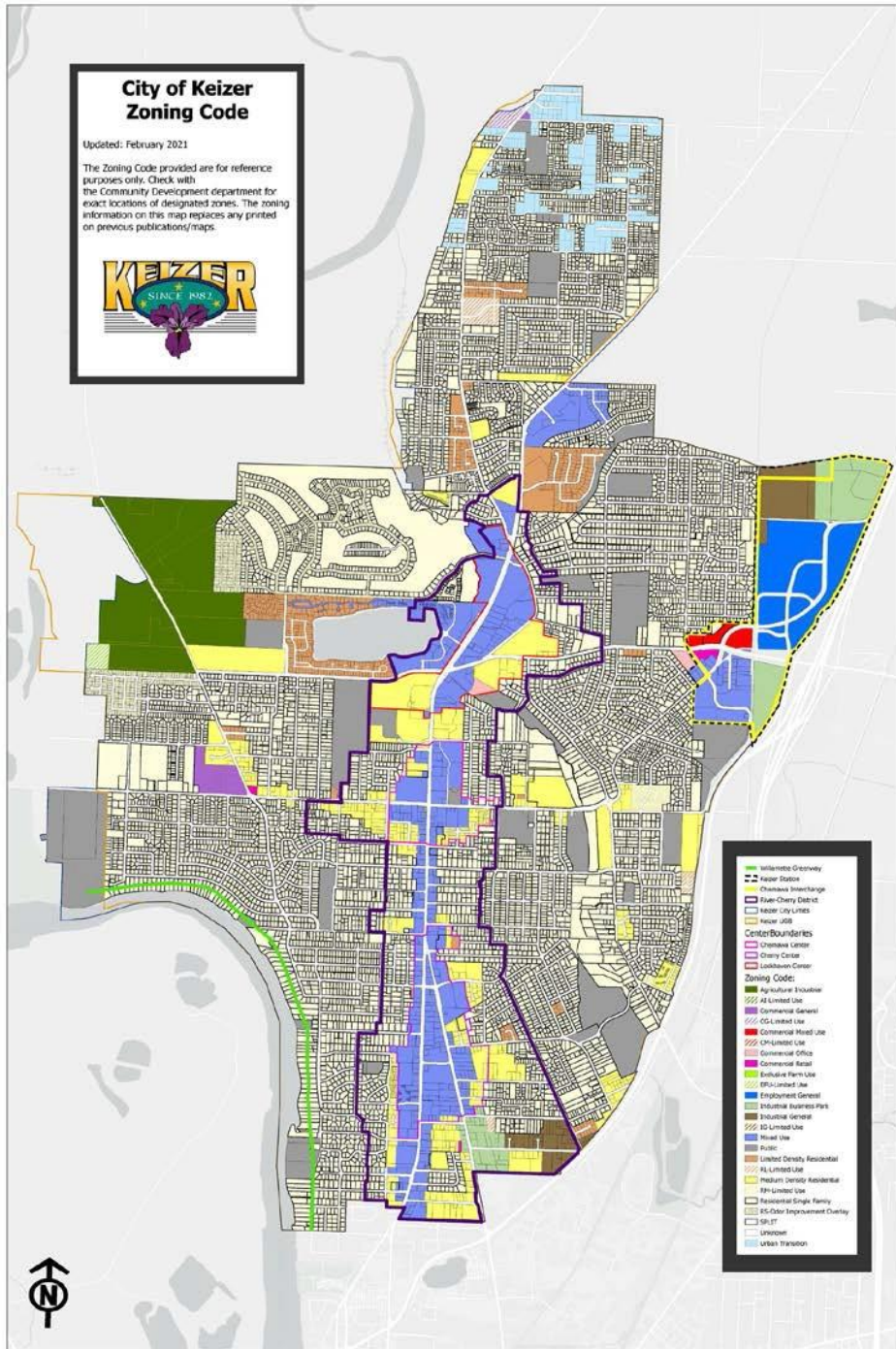
8.4.1 Community Characteristics

The City of Keizer is in Marion County, Oregon, immediately north of the City of Salem. The city is bordered to the west by the Willamette River and to the east by Highway 99 and Interstate 5. Keizer is in Oregon’s Willamette Valley, which experiences a moderate climate. In August, the average high temperature is 82 degrees, and the average low temperature is 51 degrees. Wintertime temperatures in January range from an average high of 46 degrees to an average low of 33 degrees. The average annual precipitation is 39.9 inches. In addition to the Willamette River, other bodies of water that run through the city include Stats Lake, Claggett Creek, and Labish Ditch. Keizer is located on a relatively flat area, with a few steep slopes bordering the Willamette River.

The 2020 US Census lists Keizer’s population at 39,376 people, a nearly 6.5% increase from the 2015 population of 36,985. For more demographic information, refer to Volume III, Appendix B, *Community Profile*

Historically, Keizer was an agricultural community, but in the 1960s and 70s, the city grew rapidly into a residential suburb of Salem along North River Road. Today, Keizer’s primary employment sectors are service, retail, and public administration. The median household income in Keizer is \$50, 897. For more economic information, Volume III, Appendix B, *Community Profile*

Figure 8-1, Zoning Map of the City of Keizer



Source: City of Keizer website,
<https://www.keizer.org/media/Departments/Planning%20Department/Maps/Zoning%20map%20base%20-%20Feb%202021.pdf>

8.5 Critical and Important Facilities

Critical and important facilities include:

8.5.1 Transportation

Facilities:

Bridges and Culverts:

Three bridges over Claggett Creek: Chemawa, Dearborn, and Alder. 2022 participants in the HVA assessment reported that in the past 10 years Dearborn and Chemawa bridges have been redone. If damaged, evacuation of the eastern half of the community would be disrupted.

Alder Bridge is one of only two access points to Claggett Creek Middle School and Weddle Elementary School.

Alder Bridge has water and communications.

Bridge over Labish Ditch at 35th (Owned by Marion County). If damaged, access to areas north of Keizer would be limited.

Keizer has two concrete box culverts located on River Rd. at Lockhaven Drive and at Wheatland Road. If they become non-functional, parts of town would be cut off.

Major roads: I-5, the Salem Parkway, River Rd., and Lockhaven Drive.

Keizer Transit Center: 5860 Keizer Station Blvd.

Flooding Concerns:

Since the 1996 100-year event flooding has been mitigated with the river wall tide flex value Willamette River USACE-Dam.

Stormwater Concerns:

The system is built well so that the city doesn't commonly have high water events. Rainfall of 1"/hour receded quickly in places such as the Winco parking lot at Lockhaven Dr. N and River Rd. N. Nonetheless mitigation of flooding through removal of sediment build up could be considered.

Multiple Hazard Concerns:

While not within Keizer, earthquake damage to Detroit, Parkersville, and Lookout Point Dams could have significant impacts in Keizer, such as widespread flooding or road blockage.

8.5.2 Energy

Electricity suppliers: Salem Electric and Portland General Electric.

Fuel storage capacity for diesel and unleaded to run generators at critical facilities is a concern for the city. Pump stations should be upgraded, and fuel station capacity increased to store diesel and unleaded to supply generators.

The Fire Station has diesel fuel supply for backup power for 3 days. Generators are in place at City Hall and the Police Department, and they have been used.

Bonneville Power Administration (BPA) – Chemawa Substation

Chemawa Station has a site fuel capacity issue and needs a generator (Tepper Lane NE)

8.5.3 Water

Drinking Water:

Drinking water exclusively from groundwater sources that come from the Troutdale Aquifer, pumped through 14 or 15 wells.

Three water storage facilities with a storage capacity of 2.75 million gallons. Note: Currently built to withstand earthquakes, however the water distribution system may not withstand a significant earthquake.

An emergency water agreement and curtailment plan with the City of Salem are in place. Note: Chemical spills could potentially contaminate drinking water.

Wastewater:

Willow Lake Wastewater Treatment Facility (5915 Windsor Island Rd. N) Note: The Willow Lake Wastewater Treatment Facility and main sewer lines are vulnerable to earthquakes and could potentially contaminate groundwater aquifers. The sewage system infrastructure was built in the 1960s and has not been updated. There is no Keizer cut off due to concrete box culverts at River Road, Lock Haven, Manziella, Chemawa, Claggett Creek. Note: The Keizer Public Works building was built prior to earthquake standards.

8.5.4 Communication

Most towers are at one location, the Qwest hub in the downtown area: several cell phone towers. One tower located in Bear Park is leased out. PGE Keizer Station used for weather events. Fire upgrade 800 MHz fiber down to WVCC communications. Cell towers and internet- threshold reached. City Hall (the Civic Center) has a communication tower – includes a cell carrier and the police radio. This tower has a diesel-fueled generator.

Note: City of Salem is currently mapping communication system locations.

8.5.5 Emergency Services

Fire

Keizer Fire District, 661 Chemawa Rd. NE

Marion County Fire District 1, (300 Cordon Rd. NE) – serves the northern part of Keizer, starting at Centennial.

Police

Keizer Police Department, 930 Chemawa Rd NE co-located with Keizer Civic Center, City Hall, Human Resources, Community Center, and Public Works.

Medical

Legacy Keizer Health Center (5685 Inland Shores Way N).

8.5.6 Cultural / Historical Resources

Keizer Heritage Community Center houses the Chamber of Commerce, the library, and the Keizer Museum.

Note: older buildings may be vulnerable to earthquakes.

8.5.7 Vulnerable Populations – Functional and Access Needs

Assisted living facilities:

Brookdale River Road (592 Bever Drive NE)

Avamere Court at Keizer (5210 River Road N)

Avamere – memory care (Claggett Ct).

The Village at Keizer Ridge (1165 Mcgee Court NE)

Willamette Lutheran Retirement (7693 Wheatland Road N)

Sweet Bye N Bye Adult Foster Care Home (4072 Brooks Ave. NE)

Sherwood Park Nursing & Rehabilitation Center (4062 Arleta Ave. NE)

Bonaventure Senior Living Facility (1615 Brush College Rd. NW)

Schools:

Keizer has 10 public schools, for a complete list of schools, visit the following link:

<https://salkeiz.k12.or.us/>

Simonka Place (5119 River Rd. N) – women’s shelter

Large Spanish speaking population – might be language barriers.

See hazard sections below and Section 2, Risk Assessment, for potential hazard vulnerabilities to these facilities.

8.6 Plans and Policies

Table 8-1, Plans and Policies of the City of Keizer

Document Name with Hyperlink if the document is available online	Year
Emergency Operations Plan	
Comprehensive Plan	1/19/1987, most recently updated 12/2021
Transportation System Plan	4/2009, revised 6/2014
Keizer Growth Transportation Impacts Study	10/2020
Salem-Keizer metropolitan area Regional Economic Opportunity Analysis 2012 to 2032	5/2011
Keizer Revitalization Plan	11/18/2019
Housing Needs Analysis	2019
Keizer Vision 2029	2009
Keizer Development Code	Most recently revised 11/17/2021
Stormwater Master Plan	
Public Works Strategic Plan	August 2006

8.7 Hazard Profile

Table 8-2, City of Keizer Hazard Profile

Community Overview							
Community Name	Population	# Of Buildings	Critical Facilities ¹	Total Building Value (\$)			
Keizer	38,585	16,380	15	5,592,798,000			
Hazus-MH Analysis Summary							
Hazard	Scenario	Potentially Displaced Residents	% Potentially Displaced Residents	Damaged Buildings	Damaged Critical Facilities	Lost Estimate (\$)	Loss Ratio
Flood ²	1% Annual Chance	704	1.8%	336	0	26,571,000	0.5%
Earthquake	Mt. Angel Mw 6.8 Deterministic	2,479	6.4%	3,994	5	722,048,109	13%
Exposure Analysis Summary							
Hazard	Scenario	Potentially Displaced Residents	% Potentially Displaced Residents	Exposed Buildings	Exposed Critical Facilities	Building Value (\$)	Exposure Ratio
Landslide	High and Very High Susceptibility	142	0.4%	62	0	18,852,000	0.3%
Channel Migration	Channel Migration Zone	0	0%	0	0	0	0%
Wildfire	High and Moderate Risk	17	0.0%	6	0	2,190,893	0.0%
Lahar	Medium Zone (1000 to 15000 – Year)	0	0%	0	0	0	0%
¹ Facilities with multiple buildings were consolidated into one building complex. ² No damage is estimated for exposed structures with “First floor height” above the level of flooding (base flood elevation).							
Critical Facilities							
Critical Facilities by Community	Flood 1% Annual Chance	Earthquake Moderate to Complete Damage	Landslide High and Very High Susceptibility	Channel Migration Zone	Wildfire High or Moderate Risk	Lahar Hazard	
Centennial School		X					
Claggett Creek Middle School							
Clear Lake Elementary							
Forest Ridge Elementary		X					
Gubser Elementary							
Keizer Elementary		X					
Keizer Fire District		X					
Keizer Police Department		X					
Kennedy Elementary School							
MCFD 1- Clearlake Station							
McNary High School							
Urgent Care inland Shores							
Weddle Elementary School							

8.8 Hazard Analysis

The methodology for assessing risk was the same for all jurisdictions and a detailed description of the BOLD planning methodology can be found in Volume I, a brief description is below. To complete the risk assessment, the jurisdiction representatives first updated the description, type, location, and extent of each hazard. Next, they updated the Hazard Vulnerability Analysis based on each hazard’s potential impact on the community using a calculated priority risk index (CPRI) methodology developed by BOLD Planning.² This assessment method ranks the following factors to determine risk from the range of natural hazards identified:

1. Probability (frequency) of event
2. Magnitude of event
3. Expected warning time before event.
4. Expected duration of event

Score	Probability	Warning Time	Magnitude/Severity	Duration
4	Highly Likely	Less than 6 hours	Catastrophic	More than 1 week
3	Likely	6-12 hours	Critical	Less than 1 week
2	Possible	12-24 hours	Limited	Less than 1 day
1	Unlikely	24+ hours	Negligible	Less than 6 hours

The assessment identifies three levels of risk: High, Moderate and Low.

High - High probability of occurrence; at least 50 percent or more of population at risk from hazard; significant to catastrophic physical impacts to buildings and infrastructure; major loss or potential loss of functionality to all essential facilities (hospital, police, fire, EOC and shelters).

Moderate - Less than 50 percent of population at risk from hazard; moderate physical impacts to buildings and infrastructure; moderate potential for loss of functionality to essential facilities.

Low - Low probability of occurrence or low threat to population; minor physical impacts.

IMPACT	Range Values	
	Low CPRI	High CPRI
High	3.0	4.0
Moderate	2.0	2.9
Low	1.0	1.9

A summary of the risk assessment findings and rankings is presented below.

Table 8-3, City of Keizer Hazard Vulnerability Assessment - Natural Hazards

Hazard Profile Summary for the City of Keizer Using BOLD Planning Analysis Scoring						
Natural Hazard	Probability	Warning Time	Magnitude	Duration	CPRI	2022 Local Planning Significance
Weight Factor	0.45	0.15	0.3	0.1		
Wildland Interface Fire	4	4	3	4	3.7	High
Earthquake	3	4	3	4	3.3	High
Extreme Weather - High Temperature	3	1	2	3	2.4	Moderate
Flood (including dam failure)	3	1	2	3	2.4	Moderate
Severe Weather/Storm	3	1	2	3	2.4	Moderate
Tornado (split out of Severe Weather in 2021)	2	4	2	3	2.4	Moderate
Landslide	2	2	2	3	2.1	Moderate
Drought	2	1	2	4	2.1	Moderate
Volcanic Eruption	2	1	2	4	2.1	Moderate
Avalanche (new in 2021)	1	1	1	1	1.0	Low

Source: BOLD Planning Risk Assessment Method; Analysis by City of Keizer on September 27, 2021.

*Includes dam failures; **Split out of Severe Weather; ***New in 2021

Table 8-4, City of Keizer Hazard Vulnerability Assessment – Other Hazards Hazard Profile Summary for the City of Keizer Using BOLD Planning Analysis Scoring						
Non-Natural Hazard	Probability	Warning Time	Magnitude	Duration	CPRI	2022 Local Planning Significance
Weight Factor	0.45	0.15	0.3	0.1		
Cyberterrorism	3	4	4	4	3.6	High
Public Health	4	1	3	4	3.3	High
Hazardous Materials - Non-Transportation	3	4	3	3	3.2	High
Chemical, Biological, Radiological, Nuclear, Explosive	2	4	4	4	3.1	High
Unauthorized Entry	2	4	4	4	3.1	High
Hazardous Materials Release - Transportation	2.5	4	3	3	2.9	Moderate
Fire - Residential / Commercial (Arson)	3	4	2	3	2.9	Moderate
Terrorism/Active Shooter/Workplace Violence	2	4	3	3	2.7	Moderate
Agricultural Terrorism	2	1	4	4	2.7	Moderate

Source: BOLD Planning Risk Assessment Method; Analysis by City of Keizer on September 27, 2021.

8.9 Hazard Characteristics

Hazard History, Characteristics and Extent for Marion County apply also to the City of Keizer. Volume I, Section 2, *Risk Assessment*, adequately describes the characteristics of natural hazards, as well as the location and extent of potential events. This section identifies vulnerabilities specific to the City of Keizer and illustrates the basis for the City of Keizer's HVA scores.

Recent localized natural hazard events are detailed below for the City of Keizer. Otherwise, previous occurrences are well-documented within the county's plan, and unless otherwise specified impacts described by the county would generally be the same for the City of Keizer as well.

8.9.1 Avalanche

CPRI = 1.0, Risk Level: Low

Events: None during the effective period of this plan.

Vulnerability: None. The City of Keizer is not subject to avalanche.

8.9.2 Drought

CPRI = 2.1, Risk Level: Moderate

Events: Marion County experienced D2 and D3 drought conditions during periods of 2018, 2019, 2020 and 2021.³

Vulnerability: Because the City of Keizer's water supply is primarily subsurface, the city's vulnerability is moderate. Due to a cool, wet climate, past and present weather conditions have generally spared Marion County communities from the effects of drought. Governor Kate Brown declared a drought emergency for all of Marion County in September 2015.

Keizer's primary water supply comes from the Troutdale Aquifer. Raw water is treated for consumption at the Willow Lake Water Treatment Facility. The City has three (3) storage reservoirs with storage capacity for 2.75 million gallons of treated water. In addition, Keizer maintains an emergency water agreement with the City of Salem.

Plan Integration: Keizer reviewed and updated Keizer's water management plan during the previous update period to include new information and revisit emergency water agreements with the City of Salem. Keizer adopted the revised agreements and ordinance language in 2016. The ordinance includes a water curtailment plan.

8.9.3 Earthquake

CPRI = 3.3, Risk Level: High

Events: Five earthquakes ranging between, 1.5 and 1.7 and one registering 3.0 occurred northwest of Keizer during the effective period of the prior plan (Figure 8-2)

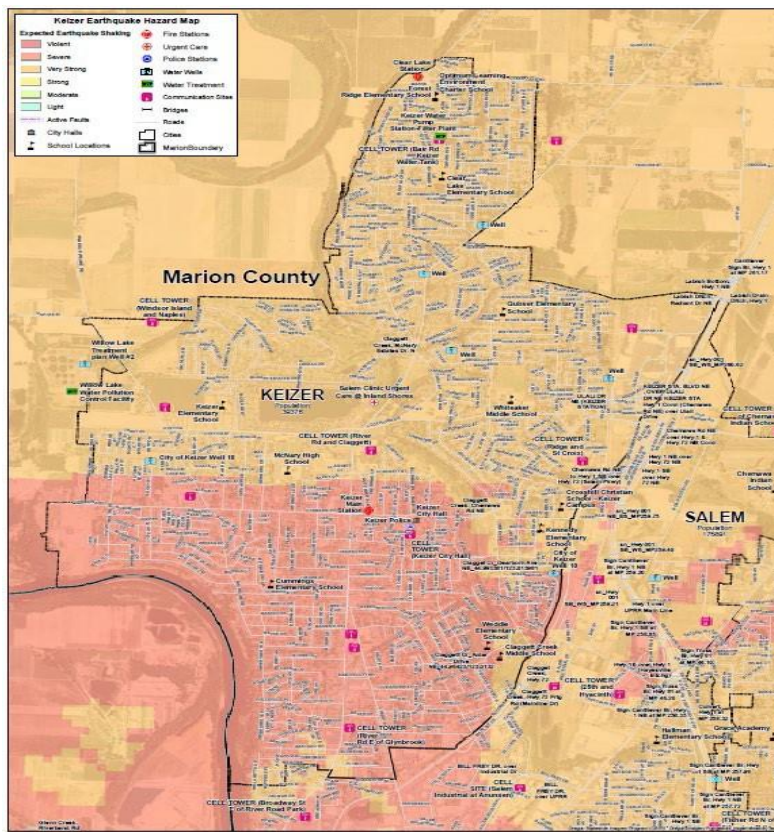
Vulnerability: There are no locally active faults within the Keizer City Limits. Active faults do exist within five miles to the west and south. The 1993 Scott Mills quake caused \$28 million in damage to cities throughout Marion County. Generally, an event that affects the county is likely to affect Keizer as well. Previous occurrences are well-

documented within the county’s plan, and the community impacts described by the county would generally be the same for Keizer as well.

The City of Keizer’s probability for a Crustal Earthquake event is “possible” and that the city’s vulnerability to a Crustal Earthquake event is “limited”. The county steering committee determined that the probability for a CSZ Earthquake event is “highly likely” and that the vulnerability to a Cascadia Earthquake event is “catastrophic”. This hazard was not rated as distinct CSZ and crustal events in the previous HMP.

In many major earthquakes, damage has primarily been caused by the behavior of the soil. Figure 8-3 shows that ground shaking in Keizer for both crustal and subduction earthquakes are expected to be very strong to severe.

Figure 8-2, Keizer Earthquake Hazard Map



Source: DOGAMI Multi-Hazard Risk Report, 2022

The representatives from Keizer and the Keizer Fire District identified vulnerabilities related to the earthquake hazard.

- The 2016 steering committee members suggested conducting analysis of the city’s 16 wells and how they will be impacted by earthquake.
- Another concern identified is the potential impact to Claggett Creek from sanitary sewer infrastructure impacts. Broken wastewater infrastructure could result in contamination.

- The 2016 steering committee members and the 2022 city representatives also noted that if culverts on River Road collapsed, significant portions of the city could be cut off from vehicle access.

In 2022, the Department of Geology and Mineral Industries (DOGAMI) conducted a multi-hazard risk report for critical facilities including public school buildings, acute inpatient care facilities, fire stations, police stations, sheriffs' offices, and other law enforcement agency buildings. The DOGAMI analysis used a deterministic scenario method along with a User Defined Facility (UDF) database containing attributes for each building (such as building seismic codes) so that loss estimates could be calculated on a building-by-building basis. Within the City of Keizer, the following critical facilities are predicted at >50% probability to experience a moderate or complete damage in a Mw 6.8 earthquake:

- Centennial School
- Cummings Elementary School
- Keizer Elementary School
- Keizer Fire District
- Keizer Police Department

Keizer participates in the Great Oregon Shakeout each year and posts “Living on Shaky Ground” education documents at city hall. In addition, the City’s Community Emergency Response Team is actively engaged in the promotion of earthquake safety and community outreach actions. The city eliminated two actions from the previous HMP related to earthquake preparation due to these ongoing efforts.

8.9.4 Extreme Heat

CPRI = 2.4, Risk Level: Moderate

Events:

8/9 through 8/12/2021 Excessive heat; Hot weather began to develop August 9, peaking August 11-12, but temperatures continued above normal into the weekend. Peak afternoon temperatures of 100 to 105 degrees drove people to seek relief in or near bodies of water. Heat caused slowdowns on public transportation systems and some businesses did close due to the heat. Cooling shelters were opened in several counties.

7/29/2021 Heat; on July 29th, the high temperature at the Salem Airport reached 99 degrees Fahrenheit. Temperatures in the area peaked in the mid and upper 90s.

6/26/2021 Excessive Heat; temperatures across the area warmed into the 100s to mid-110s over a three-day period. Record breaking temperatures up to 117 degrees were recorded in Salem, OR. A total of 18 heat related deaths were reported, including two middle aged men who drowned in the Willamette River on Saturday, June 26.

8/14 through 8/17/2020 Heat; high pressure over the region led to a stretch of hot days from August 14 through August 17. Hot temperatures resulted in many people

seeking locations to cool off in local rivers, which lead to two drownings as well as multiple people going to local hospitals for treatment of typical heat-related medical symptoms.

7/12 through 7/18/2018 Heat; high pressure over the region led to a stretch of hot day July 12 through July 17th. Hot temperatures led people to cool off in local rivers. There were two drownings recorded on July 16 and July 18.

8/1/2017 Excessive Heat; the record-breaking heat led people to seek relief at local rivers. One child drowned (indirectly) while swimming in the Willamette River near the Wallace Marine Park.

Vulnerability: NA

8.9.5 Flood

CPRI = 2.4, Risk Level: Moderate

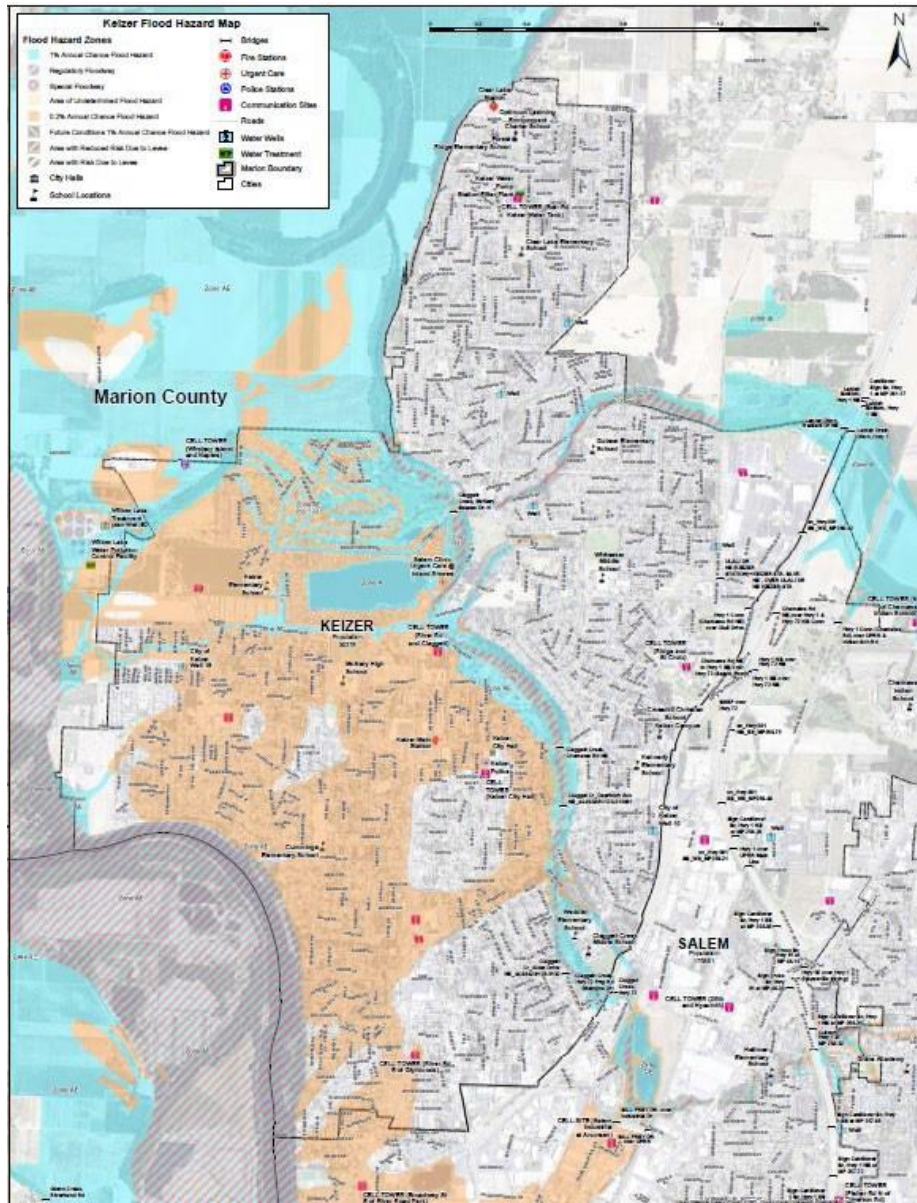
Events: NA

Vulnerability: The city's probability for riverine flood is likely and their vulnerability to flood is critical. Committee members noted that ongoing FEMA flood map updates may increase the base flood elevation by roughly three feet. This is primarily related to an existing earthen dike and flood wall constructed along the Willamette River after the 1996 flood event. If the flood elevation increases, the wall will no longer be certifiable. Any breaching of the dike or wall would result in the inundation of the western half of Keizer.

Some minor flooding does occur on Claggett Creek. However, the flooding is generally isolated. A related mitigation success is the ongoing retrofit and upgrade of Dearborn Bridge over Claggett Creek.

Portions of Keizer have areas of flood plains (special flood hazard areas). These include areas along Mary's River (see Figure 3). Furthermore, other portions of Keizer, outside of the mapped floodplains, are also subject to significant, repetitive flooding from local storm water drainage.

Figure 8-3, City of Keizer Special Flood Hazard Area (FEMA flood map)



Source: DOGAMI Multi-Hazard Risk Report, 2022

National Flood Insurance Program (NFIP)

The NFIP has two types of loss classifications, Repetitive Loss (RL) Property and Severe Repetitive Loss (SRL) Property. **RL**, property is any insurable building for which two or more claims of more than \$1,000 were paid by the National Flood Insurance Program (NFIP) within any rolling ten-year period, since 1978. A RL property may or may not be currently insured by the NFIP. **SRL** property is a single family property (consisting of 1 to 4 residences) that is covered under flood insurance by the NFIP and has incurred flood-related damage for which 4 or more separate claims payments have been paid under flood insurance coverage, with the amount of each claim payment exceeding \$5,000 and with

cumulative amount of such claims payments exceeding \$20,000; or for which at least 2 separate claims payments have been made with the cumulative amount of such claims exceeding the reported value of the property.

FEMA modernized the Keizer Flood Insurance Rate Maps (FIRMs) in January of 2000. The table below shows that as of June 2022, Keizer has 315 National Flood Insurance Program (NFIP) policies in force. Of those, 151 are for properties that were developed before the development of the initial FIRM. The last Community Assistance Visit (CAV) for Keizer was on March 4, 2020. Keizer is not a member of the Community Rating System (CRS). The table shows that most flood insurance policies are for residential structures, primarily single-family homes. There have been 32 paid flood claims in Keizer totaling \$428,779.

The Community Repetitive Loss record for Keizer identifies 2 Repetitive Loss Properties⁴ and no Severe Repetitive Loss Properties⁵. Notably, following flooding in 1996/1997, Keizer successfully used FEMA HMGP funds to relocate several homes out of the floodplain.

Table 8-5, Flood Insurance Detail

Jurisdiction	Effective FIRM and FIS	Initial FIRM Date	Total Policies	Pre-FIRM Policies	Policies by Building Type				Minus Rated Policies A Zone
					Single Family	2 to 4 Family	Other Residential	Non-residential	
Marion County			240	128	212	1	4	23	7
City of Keizer	1/19/2000	8/15/1979	316	151	287	7	7	15	6

Jurisdiction	Total Insurance in Force	Total Paid Losses	Pre-FIRM Claims Paid	Substantial Damage Claims	Total Losses Paid	Repetitive Loss Buildings	Severe Repetitive Loss	CRS Rating	Last Community Assistance
Marion County	\$66,156,800	101	76	6	\$1,218,648	20		6	7/28/2021
City of Keizer	\$101,581,800	32	20	1	\$428,779	2			3/4/2020

Source: Information compiled by Department of Land Conservation and Development, June 2022.

Please review the Risk Assessment (Volume 1, Section 2) for additional information on this hazard.

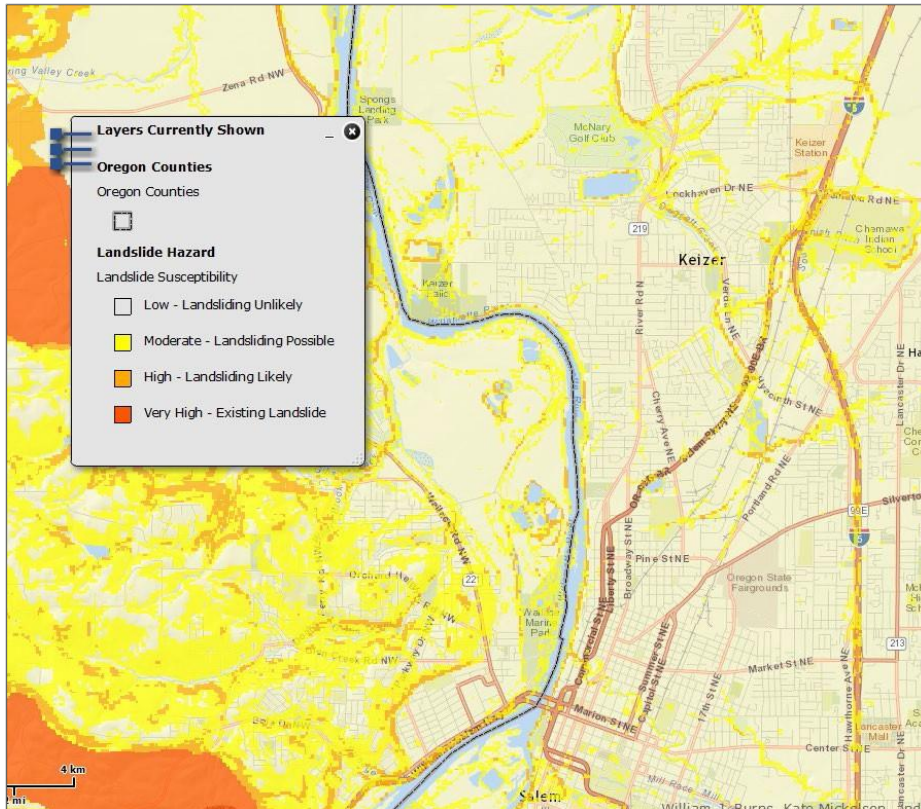
8.9.6 Landslide

CPRI = 2.1, Risk Level: Moderate

Events: None

Vulnerability: The City of Keizer has a relatively flat topography, however some areas of Keizer have hills, which could result in a landslide event. Figure 8-5, highlights the area of vulnerability.

Figure 8-4, Landslide Susceptibility Exposure



Source: Oregon HazVu: Statewide Geohazards Viewer (DOGAMI)

8.9.7 Severe Weather

CPRI = 2.4, Risk Level: Moderate

Windstorm

Events:

12/11/2021; High Wind; a strong Pacific front caused high winds along the coast and coast range, as well as strong winds through the Willamette Valley. Several reports of downed trees and branches as well as power outages for thousands of customers.

11/4/2021; Strong Wind; deep low-pressure system and associated front moved

ashore brought high wind to the coast and windy conditions to the Willamette Valley.

1/12/2021; Strong Wind; a series of slow-moving fronts brought periods of heavy rain along with strong winds.

1/5/2019; Strong Wind; the Salem Airport ASOS recorded wind gusts up to 54 mph.

12/8/2018; Strong Wind; a strong low-pressure system over the Gulf of Alaska brought a strong cold front through. This generated strong winds across northwest Oregon. Reports of trees downed near McMinnville and a section of fence 3 miles WNW of Salem blown over.

4/7/2017; High Wind, Salem Airport recorded wind gusts up to 60 mph. There were reports of downed trees and power outages around Salem and Keizer.

Vulnerability: Significant wind events occur in Keizer each year. Damaging wind events are only slightly less common; once or twice per year the city will experience a windstorm event that will interrupt services, experience downed trees, and cause power outages.

Because windstorms typically occur during winter months, they are sometimes accompanied by ice, freezing rain, flooding, and very rarely, snow.

Winter Storm (Snow/Ice)

Events:

12/25/2021; Heavy Snow showers increased the night of the 25th, continuing through the 26th, resulting in significant travel issues for the holiday weekend. Around 4 to 8 inches of snowfall were reported.

2/11 to 2/13/2021; Ice Storm, this was a crippling ice storm for the Salem metro area where generally amounts of 0.5 to 1.25 inches of ice were reported, and many were without power for days.

1/26/2021; Winter Weather, light snow fell during the day as a front moved through the area. General amounts were 1 to 2 inches with local snow amounts of 3 inches. The snow ended in the evening.

3/5 to 3/6/2017; Heavy Snow, reports of 3.5 to 4 inches near Dallas/Falls City and 6 inches in McMinnville.

1/10 to 1/11/2017; Heavy Snow, 1 to 2 inches reported in the Salem area.

1/7 to 1/8/2017; Winter Storm with 1-2 inches of snow/sleet and 0.25 inches of freezing rain.

Vulnerability: Severe winter storms can consist of rain, freezing rain, ice, snow, cold temperatures, and wind. They originate from troughs of low pressure offshore that ride along the jet stream during fall, winter, and early spring months. Severe winter storms affecting the city typically originate in the Gulf of Alaska or in the central

Pacific Ocean. These storms are most common from November through March.

Major winter storms can and have occurred in the Keizer area, and while they typically do not cause significant damage, they are frequent and have the potential to impact economic activity. The February 2021 ice storm was the most significant severe weather event in the recent past. The key impacts included widespread tree damage and power outages, and approximately 110,000 customers without power in Salem. Multiple road closures as well including Highway 99.

8.9.8 Tornado

CPRI = 2.4, Risk Level: Moderate

Events: None identified during the effective period of the prior plan.

Vulnerability: Not reported

8.9.9 Wildfire

CPRI = 3.7, Risk Level: High

Events: There were no wildfires within the City of Keizer during the effective period of the prior plan. The wildfires that occurred in the foothills of the Cascades during September 2020 did impact the city with smoke.

Vulnerability: Keizer is located on the far western side of Marion County, surrounded by open farmland, waterways, or urban development. There are no forests within the city limits, and the closest forested area is Keizer Rapids Park, located half a mile west of the city. Due to its location, Keizer faces minimal risk of experiencing wildfires. There is no history of wildfire events in Keizer.

The County updated the Community Wildfire Protection Plan in 2016 and Keizer is not listed as a “Community at Risk.”

8.9.10 Volcano

CPRI = 2.1, Risk Level: Moderate

Events: No events in the City of Keizer during the effective period of the prior plan.

Vulnerability: Keizer is very unlikely to experience anything more than volcanic ash during a volcanic event. When Mt. Saint Helens erupted in 1980, the city was not impacted.

Please review the Risk Assessment (Volume I, Section 2) for additional information on these hazards.

8.10 Mitigation Strategy

The 2022 mitigation actions were categorized as Priority Actions or actions listed in the Action Item Pool.

8.10.1 City of Keizer Mitigation Actions

The city listed a set of high priority actions to focus attention on an achievable set of high leverage activities over the next five years. The City's priority actions are listed in Table on the following pages.

8.10.2 Action Item Pool

Table 8.6 on the following pages presents a pool of mitigation actions. This expanded list of actions is available for local consideration as resources, capacity, technical expertise and/or political will become available.

During the 2022 Marion County and Keizer update process, the City of Keizer NHMP Steering Committee member, Matt Reyes, worked with the DLCDC Natural Hazards Planner to discuss the city's Mitigation Strategy. Reyes also conveyed the updates provided to the County Emergency Services Coordinator in 2021.

These are included as the 2022 updates and changes in the City of Keizer Mitigation Strategy.

The proposed updates to the mitigation actions were then re-reviewed by the steering committee to finalize. Keizer reviewed a list of priority actions and other actions that were not prioritized. These mitigation actions may be considered during the annual plan maintenance meeting.

Table 8-6, City of Keizer Mitigation Action Items

#	Hazard	Mitigation Action/Description	Priority	Timeline	Cost	Coordinating Organization	Status
Priority Actions							
2022-P-1	Earthquake	Work with Cities of Salem and Turner to perform seismic evaluation of wastewater transmission infrastructure and impact on drinking water supply.	H	1-2 Years	TBD	City of Keizer Public Works	Not Started
2022-P-2	Earthquake	Conduct seismic evaluation of Keizer's drinking water well field.	H	3-5 Years	TBD	City of Keizer Public Works	Not Started
2022-P-3	Earthquake	Conduct seismic evaluation of Chemawa, Dearborn, and Alder Street bridges over Claggett Creek	H	1-2 Years	TBD	City of Keizer Public Works	Not Started
2022-P-4	Earthquake	Assess the feasibility and cost to seismically retrofit Keizer's public works facilities (City shops).	H	5+ Years	TBD	City of Keizer Public Works	Not Started
Action Items							
2022-MH-1	Multi-Hazard	Create an emergency preparedness section on the City's website. Populate with resources and publicize.	M	12 months	Staff Time	City Administration	On-going
2022-MH-2	Multi-Hazard	Maintain a regular presence at outreach events, especially neighborhood association events, and provide the public with preparedness resources.	M	Annually	Staff Time	City Administration	On-going
2022-MH-3	Multi-Hazard	Make guest appearance on local radio shows to provide announcements and resources for preparedness.	M	Annually	Staff Time	City Administration	On-going
2022-MH-4	Multi-Hazard	Add hazard awareness material into existing environmental education currently done in schools.	M	1-3 Years	TBD	City Administration	On-going
2022-MH-5	Multi-Hazard	Join Marion County's Everbridge communication system.	M	1-2 Years	TBD	City Administration	On-going
2022-MH-6	Multi-Hazard	Encourage residents to participate in Everbridge.	M	Annually	Staff Time	City Administration	On-going

#	Hazard	Mitigation Action/Description	Priority	Timeline	Cost	Coordinating Organization	Status
2022-MH-7	Multi-Hazard	Meet with the City of Salem to discuss the Willow Lake Wastewater Treatment Plant: *How it can be reinforced to minimize damage in a hazard event. *How hazardous materials can be secured or removed to prevent groundwater contamination	H	1-2 Years	TBD	City of Keizer Public Works	Not Started
2022-MH-8	Multi-Hazard	Further develop risk assessment maps to show areas at risk for all hazards.	M	1-2 Years	TBD	City Administration	Not Started
2022-MH-9	Multi-Hazard	Develop mutual aid agreements with surrounding counties.	M	1-2 Years	TBD	City Administration	Not Started
2022-MH-10	Multi-Hazard	Expand on the information gathered for the internal public works operational manual to create a full registry of populations that may need assistance in an emergency.	M	3-5 Years	TBD	City of Keizer Public Works	Not Started
2022-MH-11	Multi-Hazard	Update the Continuity of Operations Plan.	M	1-2 Years	TBD	City Administration	Not Started
2022-MH-12	Multi-Hazard	Participate in Marion County's post-disaster recovery planning efforts.	M	3-5 Years	TBD	City Administration	Not Started
2022-MH-13	Multi-Hazard	Continue development of CERT teams to ease the load on emergency services following a disaster.	M	1-5 Years	Staff Time	City Administration	Not Started
2022-MH-14	Multi-Hazard	Develop memoranda of understanding with appropriate facilities specifying that they will function as emergency shelters during disruptive events with support from the City.	M	1-2 Years	Staff Time	City Administration	Not Started
2022-MH-15	Multi-Hazard	Educate businesses and governmental organizations about the importance of developing continuity of operations plans.	M	Annually	Staff Time	Environmental Services	On-going
2022-MH-16	Multi-Hazard	Update the Keizer Comprehensive Plan to reflect statewide land use Goal 7 language surrounding natural hazards.	M	3-5 Years	TBD	Planning	Not Started

#	Hazard	Mitigation Action/Description	Priority	Timeline	Cost	Coordinating Organization	Status
2022-EQ-1	Earthquake	Participate in the Great Shakeout each year.	M	Annually	Staff Time	City Administration	On-going
2022-EQ-2	Earthquake	School seismic retrofitting action - need to talk to school district representative.	M	1-2 Years	TBD	City Administration	Not Started
2022-EQ-3	Earthquake	Send city employees to the County's ATC 20 training.	M	1-5 Years	TBD	City of Keizer Public Works	Not Started
2022-EQ-4	Earthquake	Perform a seismic analysis of box culverts in Keizer and repair or upgrade as resources become available.	M	3-5 Years	TBD	City Administration	Started
2022-EQ-5	Earthquake	Encourage residents to prepare and maintain 2-week survival kits.	L	Annually	Staff Time	City Administration	On-going
2022-FL-1	Flood	Continue compliance with the National Flood Insurance Program through the enforcement of local floodplain ordinances. Update enforcement based on changes to the NFIP (such as flood elevation level changes).	M	1-5 Years	TBD	Planning	On-going
2022-FL-2	Flood	Improve water quality and water flow through wetland vegetation restoration and stream cleanup, especially along Claggett Creek.	M	1-5 Years	TBD	Environmental	On-going
2022-FL-3	Flood	Educate residents and business owners near Labish and Claggett creeks about how to manage flood risks.	M	Annually	Staff Time	Environmental	On-going
2022-SW-1	Severe Weather	Educate the public about windstorm-resistant trees and landscaping practices and the role of proper tree pruning and care in preventing damage during windstorms.	M	Annually	Staff Time	Environmental	On-going
2022-SW-2	Severe Weather	Ensure that all critical facilities have backup power and/or emergency operations plans to deal with power outages.	M	1-5 Years	TBD	City Administration	On-going
2022-SW-3	Severe Weather	Record instances of infrastructure failure and notify PGE of infrastructure that regularly fails.	M	1-5 Years	TBD	City Administration	On-going

9 Keizer Fire District Addendum

9.1 Purpose

This document serves as the Keizer Fire District’s Addendum to the Marion County Multi-Jurisdictional Hazards Mitigation Plan (MHMP, HMP). The purpose of this addendum is to guide the implementation of mitigation actions by Keizer Fire District to improve the resilience of the community. Please note that mitigation planning is a long-term endeavor— one that requires broad internal involvement and community engagement to be successful. Finally, please refer to the information contained in Volume I (Basic Plan) and Volume III (Appendices) of this HMP, which provides additional information (particularly regarding participation and mitigation strategy) and forms the basis of this addendum.

9.2 Plan Process, Participation, and Adoption

In 2021 and early 2022, Marion County partnered with the Oregon Department of Land Conservation and Development (DLCDD) and the Oregon Department of Emergency Management (OEM), and Marion County cities, including Keizer Fire District, to update their addendum to the Marion County Hazard Mitigation Plan, which expired August 16, 2022.

By developing this addendum to the Marion County HMP, locally adopting it, and having it approved by FEMA, the Keizer Fire District will gain eligibility for FEMA Hazard Mitigation, Pre-Disaster Mitigation, and Flood Mitigation Assistance grant program funds. This project is funded through the Federal Emergency Management Agency’s (FEMA) FY19 Pre-Disaster Mitigation Competitive Grant Program (PDMC-PL-10-OR-2019-003).

The Keizer Fire District joined the Marion County HMP update by executing an intergovernmental agreement with DLCDD on October 1, 2021. On September 27, 2021, Keizer Fire District Fire Chief James Cowan, Marion County Emergency Preparedness Coordinator Mike Hintz, and DLCDD Planner Tricia Sears conducted a risk assessment meeting with the Keizer Fire District that included a Hazard Vulnerability Assessment ranking. City staff met again with DLCDD on April 11, 2022, to update this addendum.

Chief Cowan of the Keizer Fire District attended HMP Steering Committee meetings on August 3, 2021; October 5, 2021; November 21, 2021; December 7, 2021; March 1, 2022; and April 5, 2022. The district promoted the HMP survey and outreach efforts throughout the plan update, including public posts on the Keizer Fire District Facebook page on November 2, 2021, to inform the public of the project and on January 25, 2022, to distribute the plan update public survey to interested parties in the Keizer Fire District service area.

9.3 Risk Assessment

A risk assessment is intended to provide the “factual basis for activities proposed in the strategy to reduce losses from identified hazards” (Department of Homeland Security, Federal Emergency Management Agency, 2023). This section of the HMP addendum can serve as the factual basis for addressing Oregon Statewide Planning Goal 7 – Areas Subject to Natural Hazards.

9.4 District Profile

This section provides information on district specific assets and populations. For additional information on the characteristics of Keizer Fire District, in terms of geography, environment, population served, demographics, employment and economics, as well as housing and transportation for the city it serves see Volume III, Appendix C, Community Profile. Many of these community characteristics can affect how natural hazards impact communities and how communities choose to plan for natural hazard mitigation.

Considering the district specific assets during the planning process can assist in identifying appropriate measures for natural hazard mitigation.

9.4.1 District Characteristics

The Keizer Fire District serves the City of Keizer and some adjacent areas in Marion County, Oregon. Keizer Fire District is a full-service fire, rescue, and EMS agency with a force of 38 career employees, 20 volunteer firefighters, and 12 explorer scouts and 5 elected Board of Directors who serve the district’s 39,315 citizens from one centrally located fire station. Keizer Fire District ran 5,235 emergency calls in 2020.

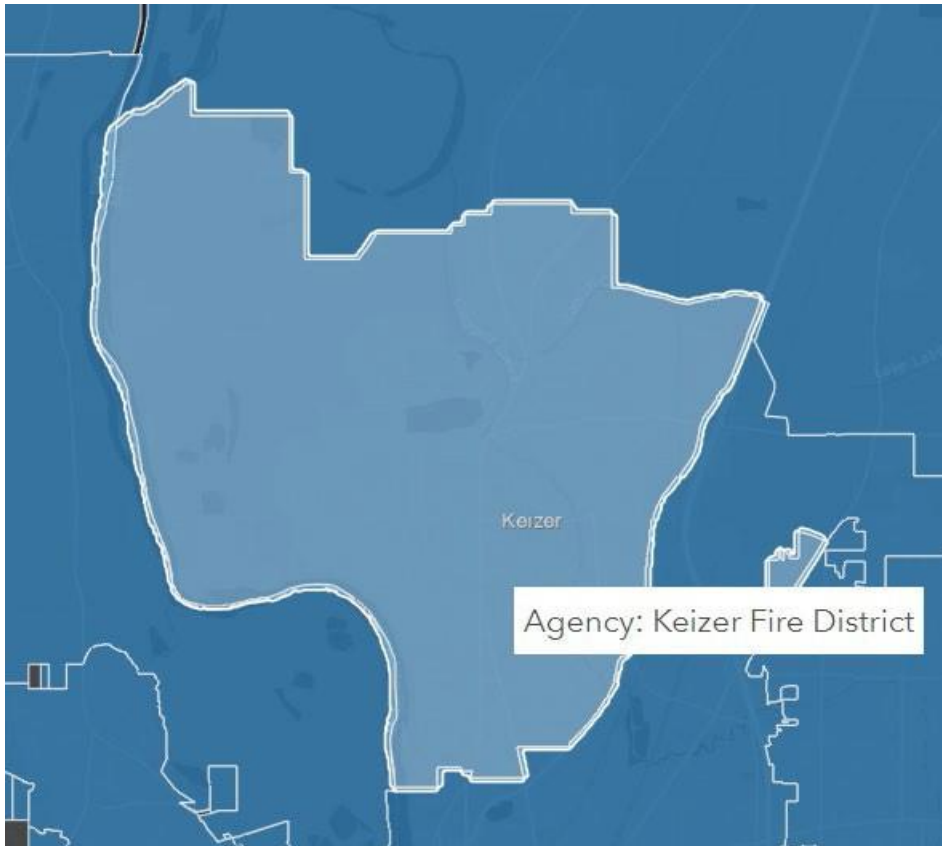
The Keizer Fire District is approximately 10 square miles with a population of just over 39,000. Fire, rescue, and emergency medical services are provided to a majority of the city from one fire station. Station 350 is Keizer Fire District’s only station. The district is made up of various types of building occupancies, with the majority being residential. There are multiple levels of educational facilities within the district, as well as several retirement complexes.

In 1996, the original fire station was demolished so that a new fire station could be built in the same location. This new fire station will house eight pieces of fire or medical apparatus, offices, sleeping quarters, an exercise room, training rooms, two kitchens, and a multi- purpose room.

In January of 1950, the Fire District acquired a 1500-gallon tanker. Due to its size and the way it was designed, the Firefighters named it “Jumbo”. This equipment was purchased through the School District and cost \$400.00. In October of 1953, a third piece of equipment was added. This piece of apparatus had a high-pressure pump, and several compartments designed to carry salvage equipment, lights, a generator and air masks.

Radios were first added to the fleet in 1953. It wasn’t until 1979 that the first Rescue vehicle was purchased. This vehicle was the primary response vehicle for EMS calls.

Figure 9-1, Keizer Fire District Service Area



Source: Oregon State Fire Marshall Structural Fire District map
[Structural Fire Districts | Structural Fire Districts | OSFM \(arcgis.com\)](#)

9.5 Critical and Important Facilities

Keizer Fire District’s critical and important facilities include its fire station and equipment. The district maintains four fire engines and a ladder truck as well as four ambulances and five other vehicles. The fire station was constructed in 1997. The district has diesel fuel supply for backup power for 3 days.

See hazard sections below for potential hazard-related vulnerabilities to these facilities.

9.6 Plans and Policies

Table 9-1, Keizer Fire District Policies and Plans

Document Name with Hyperlink if the document is available online	Year
Standard of Cover	NA
Emergency Operations Plan	NA

9.7 Hazard Profile

The City of Keizer Hazard profile is used to represent the vulnerabilities of the Keizer Fire District.

Table 9-2, Keizer Fire District Hazard Profile

Community Overview							
Community Name	Population	# Of Buildings	Critical Facilities ¹	Total Building Value (\$)			
Keizer	38,585	16,380	15	5,592,798,000			
Hazus-MH Analysis Summary							
Hazard	Scenario	Potentially Displaced Residents	% Potentially Displaced Residents	Damaged Buildings	Damaged Critical Facilities	Lost Estimate (\$)	Loss Ratio
Flood ²	1% Annual Chance	704	1.8%	336	0	26,571,000	0.5%
Earthquake	Mt. Angel Mw 6.8 Deterministic	2,479	6.4%	3,994	5	722,048,109	13%
Exposure Analysis Summary							
Hazard	Scenario	Potentially Displaced Residents	% Potentially Displaced Residents	Exposed Buildings	Exposed Critical Facilities	Building Value (\$)	Exposure Ratio
Landslide	High and Very High Susceptibility	142	0.4%	62	0	18,852,000	0.3%
Channel Migration	Channel Migration Zone	0	0%	0	0	0	0%
Wildfire	High and Moderate Risk	17	0.0%	6	0	2,190,893	0.0%
Lahar	Medium Zone (1000 to 15000 – Year)	0	0%	0	0	0	0%
¹ Facilities with multiple buildings were consolidated into one building complex. ² No damage is estimated for exposed structures with “First floor height” above the level of flooding (base flood elevation).							
Critical Facilities*							
Critical Facilities by Community	Flood 1% Annual Chance	Earthquake Moderate to Complete Damage	Landslide High and Very High Susceptibility	Channel Migration Zone	Wildfire High or Moderate Risk	Lahar Hazard	
Centennial School		X					
Claggett Creek Middle School							
Clear Lake Elementary							
Forest Ridge Elementary		X					
Gubser Elementary							
Keizer Elementary		X					
Keizer Fire District		X					
Keizer Police Department		X					
Kennedy Elementary School							

MCFD 1- Clearlake Station						
McNary High School						
Urgent Care inland Shores						
Weddle Elementary School						
Whitaker Middle School						

Source: Multi hazard Risk Report, DOGAMI, Williams, 2022.

* The Critical Facilities of the Keizer Fire District are included within the City of Keizer Critical Facilities list. The city’s facilities are within the service district of the Keizer Fire District and therefore are of concern to the district as they provide services to children and people seeking health care.

9.8 Hazard Analysis

The methodology for assessing risk was the same for all jurisdictions and a detailed description of the BOLD planning methodology can be found in Volume I, a brief description is below. To complete the risk assessment, the jurisdiction representatives first updated the description, type, location, and extent of each hazard. Next, they updated the Hazard Vulnerability Analysis based on each hazard’s potential impact on the community using a calculated priority risk index (CPRI) methodology developed by BOLD Planning. This assessment method ranks the following factors to determine risk from the range of natural hazards identified:

1. Probability (frequency) of event,
2. Magnitude of event,
3. Expected warning time before event, and
4. Expected duration of event.

Score	Probability	Warning Time	Magnitude/Severity	Duration
4	Highly Likely	Less than 6 hours	Catastrophic	More than 1 week
3	Likely	6-12 hours	Critical	Less than 1 week
2	Possible	12-24 hours	Limited	Less than 1 day
1	Unlikely	24+ hours	Negligible	Less than 6 hours

The assessment identifies three levels of risk: High, Moderate and Low.

High - High probability of occurrence; at least 50 percent or more of population at risk from hazard; significant to catastrophic physical impacts to buildings and infrastructure; major loss or potential loss of functionality to all essential facilities (hospital, police, fire, EOC and shelters).

Moderate - Less than 50 percent of population at risk from hazard; moderate physical impacts to buildings and infrastructure; moderate potential for loss of functionality to essential facilities.

Low - Low probability of occurrence or low threat to population; minor physical impacts.

IMPACT	Range Values	
	Low CPRI	High CPRI
High	3.0	4.0
Moderate	2.0	2.9
Low	1.0	1.9

A summary of the risk assessment findings and rankings is presented below.

Table 9-3, Keizer Fire District Hazard and Vulnerability Assessment - Natural Hazards

Hazard Profile Summary for the Keizer Fire District Using BOLD Planning Analysis Scoring						
Non-Natural Hazard	Probability	Warning Time	Magnitude	Duration	CPRI	2022 Local Planning Significance
Weight Factor	0.45	0.15	0.3	0.1		
Wildland Interface Fire	4	4	3	4	3.7	High
Earthquake	3	4	3	4	3.3	High
Extreme Weather - High Temperature	3	1	2	3	2.4	Moderate
Flood*	3	1	2	3	2.4	Moderate
Severe Weather/Storm	3	1	2	3	2.4	Moderate
Tornado**	2	4	2	3	2.4	Moderate
Landslide	2	2	2	3	2.1	Moderate
Drought	2	1	2	4	2.1	Moderate
Volcanic Eruption	2	1	2	4	2.1	Moderate
Avalanche ***	1	1	1	1	1.0	Low

Source: BOLD Planning Risk Assessment Method; Analysis by City of Keizer on September 27, 2021

*Including dam failures; **Split out of sever weather in 2021; ***New in 2021

Table 9-4, Keizer Fire District Hazard and Vulnerability Assessment – Other Hazards

Hazard Profile Summary for the City of Idanha Using BOLD Planning Analysis Scoring						
Non-Natural Hazard	Probability	Warning Time	Magnitude	Duration	CPRI	2022 Local Planning Significance
Weight Factor	0.45	0.15	0.3	0.1		
Cyberterrorism	3	4	4	4	3.6	High
Public Health	4	1	3	4	3.3	High
Hazardous Materials – Non-Transportation	3	4	3	3	3.2	High
Chemical, Biological, Radiological, Nuclear, Explosive	2	4	4	4	3.1	High
Unauthorized Entry	2	4	4	4	3.1	High
Hazardous Materials Release - Transportation	2.5	4	3	3	2.9	Moderate
Fire - Residential / Commercial (Arson)	3	4	2	3	2.9	Moderate
Terrorism/Active Shooter/Workplace Violence	2	4	3	3	2.7	Moderate
Agricultural Terrorism	2	1	4	4	2.7	Moderate

Source: BOLD Planning Risk Assessment Method; Analysis by City of Keizer on September 27, 2021

9.9 Hazard Characteristics

Hazard History, Characteristics and Extent for Marion County apply also to Keizer Fire District. Volume I, Section 2, *Risk Assessment*, adequately describes the characteristics of natural hazards, as well as the location and extent of potential events. This section identifies vulnerabilities specific to Keizer Fire District, recent localized hazard events and impacts, and illustrates the basis for the city's HVA scores.

9.9.1 Avalanche

CPRI = 1.0, Risk Level: Low

Events: None during the effective period of this plan.

Vulnerability: None. Keizer Fire District is not subject to avalanche.

9.9.2 Drought

CPRI = 2.1, Risk Level: Moderate

Events: Marion County experienced D2 and D3 drought conditions during periods of 2018, 2019, 2020 and 2021 (U.S. Department of Commerce, National Oceanic and Atmospheric Administration, N.d).

Vulnerability: Because the City of Keizer's water supply which serves the Keizer Fire District is primarily subsurface, the city's vulnerability is moderate. Due to a cool, wet climate, past and present weather conditions have generally spared Marion County communities from the effects of drought. Governor Kate Brown declared a drought emergency for all of Marion County in September 2015.

The City of Keizer's primary water supply comes from the Troutdale Aquifer. Raw water is treated for consumption at the Willow Lake Water Treatment Facility. The city has three (3) storage reservoirs with storage capacity for 2.75 million gallons of treated water. In addition, Keizer maintains an emergency water agreement with the City of Salem.

The City of Keizer reviewed and updated its water management plan during the previous update period to include new information and revisit emergency water agreements with the City of Salem. Keizer adopted the revised agreements and ordinance language in 2016. The ordinance includes a water curtailment plan.

9.9.3 Earthquake

CPRI = 3.3, Risk Level: High

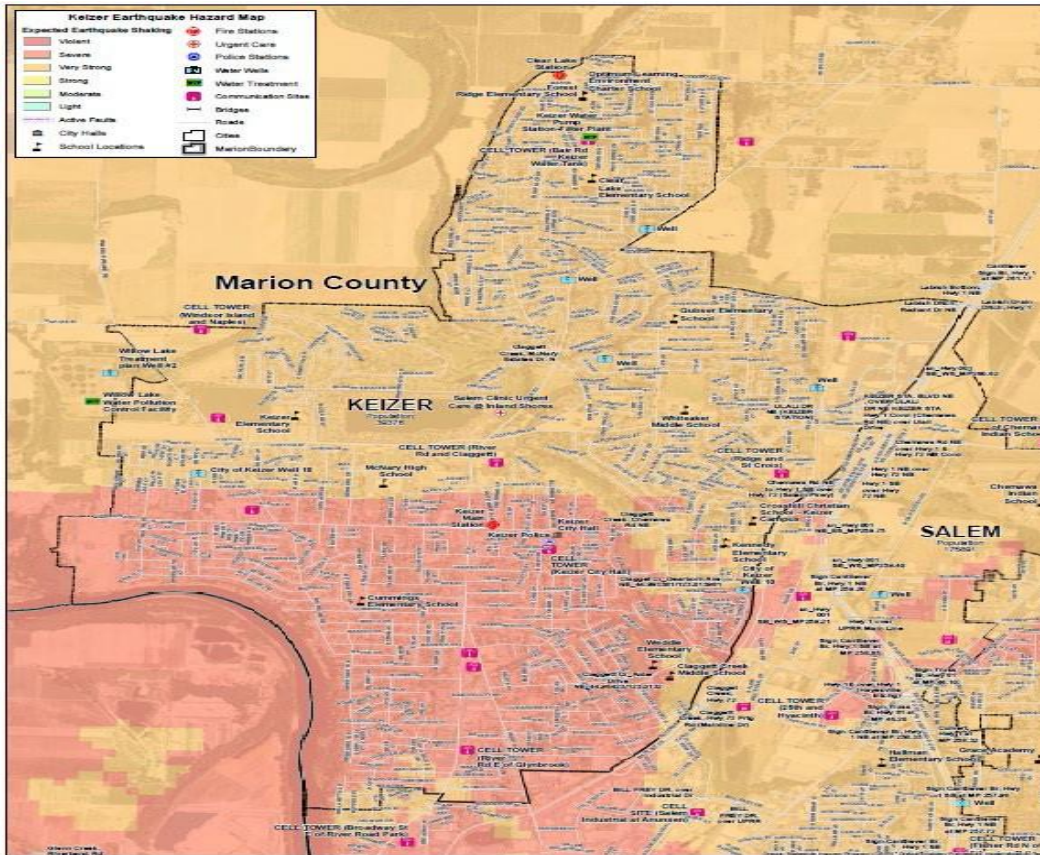
Events: Five earthquakes ranging between, 1.5 and 1.7 and one registering 3.0 occurred northwest of Keizer during the effective period of the prior plan.

Vulnerability: There are no locally active faults within the Keizer City Limits. Active faults do exist within five miles to the west and south. The 1993 Scott Mills quake caused \$28 million in damages to cities throughout Marion County. Generally, an event that affects the county is likely to affect Keizer as well. Previous occurrences are well-documented within the county's plan, and the community impacts described by the county would generally be the same for Keizer as well.

The City of Keizer’s probability for a Crustal Earthquake event is “possible” and that the city’s vulnerability to a Crustal Earthquake event is “limited”. The county steering committee determined that the probability for a CSZ Earthquake event is “highly likely” and that the vulnerability to a Cascadia Earthquake event is “catastrophic”. This hazard was not rated as distinct CSZ and crustal events in the previous HMP.

In many major earthquakes, damages have primarily been caused by the behavior of the soil. Figure 9-2 shows that ground shaking in Keizer for both crustal and subduction earthquakes are expected to be very strong to severe.

Figure 9-2, Keizer Earthquake Hazard Map



Source: DOGAMI Multi-Hazard Risk Report, 2022

The representatives from Keizer and the Keizer Fire District identified vulnerabilities related to the earthquake hazard.

- The 2016 steering committee members suggested conducting analysis of the city's 16 wells and how they will be impacted by earthquake.
- Another concern identified is the potential impact to Claggett Creek from sanitary sewer infrastructure impacts. Broken wastewater infrastructure could result in contamination.
- The 2016 steering committee members and the 2022 city representatives also noted that if culverts on River Road collapsed, significant portions of the city could be cut off from vehicle access.

In 2022, the Department of Geology and Mineral Industries (DOGAMI) conducted a multi-hazard risk report for critical facilities including public school buildings, acute inpatient care facilities, fire stations, police stations, sheriffs' offices, and other law enforcement agency buildings. The DOGAMI analysis used a deterministic scenario method along with a User Defined Facility (UDF) database containing attributes for each building (such as building seismic codes) so that loss estimates could be calculated on a building-by-building basis. Within the City of Keizer, the following critical facilities are predicted at >50% probability to experience a moderate or complete damage in a Mw 6.8 earthquake:

- Centennial School
- Cummings Elementary School
- Keizer Elementary School
- Keizer Fire District
- Keizer Police Department

9.9.4 Extreme Heat

CPRI = 2.4, Risk Level: Moderate

Events:

8/9 through 8/12/2021; Excessive heat; Hot weather began to develop August 9, peaking August 11-12, but temperatures continued above normal into the weekend. Peak afternoon temperatures of 100 to 105 degrees drove people to seek relief in or near bodies of water. Cooling shelters were opened in several counties.

7/29/2021; Heat; on July 29th, the high temperature at the Salem Airport reached 99 degrees Fahrenheit. Temperatures in the area peaked in the mid and upper 90s.

6/26/2021; Excessive Heat; temperatures across the area warmed into the 100s to mid-110s over a three-day period. Record breaking temperatures up to 117 degrees were recorded in Salem, OR. A total of 18 heat related deaths were reported, including two middle aged men who drowned in the Willamette River on Saturday, June 26.

8/14 through 8/17/2020; Heat; high pressure over the region led to a stretch of hot days from August 14 through August 17. Hot temperatures resulted in many people seeking locations to cool off in local rivers, which led to two drownings as well as multiple people going to local hospitals for treatment of typical heat-related medical symptoms.

7/12 through 7/18/2018; Heat; high pressure over the region led to a stretch of hot day July 12 through July 17th. Hot temperatures led people to cool off in local rivers. There were two drownings recorded on July 16 and July 18.

8/1/2017; Excessive Heat; the record-breaking heat led people to seek relief at local rivers. One child drowned (indirect) while swimming in the Willamette River near the Wallace Marine Park.

Vulnerability: Vulnerability to Extreme Heat in the Keizer Fire District service area relates to the likely probability of an event occurring and possibility of the event lasting up to a week in the district.

9.9.5 Flood

CPRI = 2.4, Risk Level: Moderate

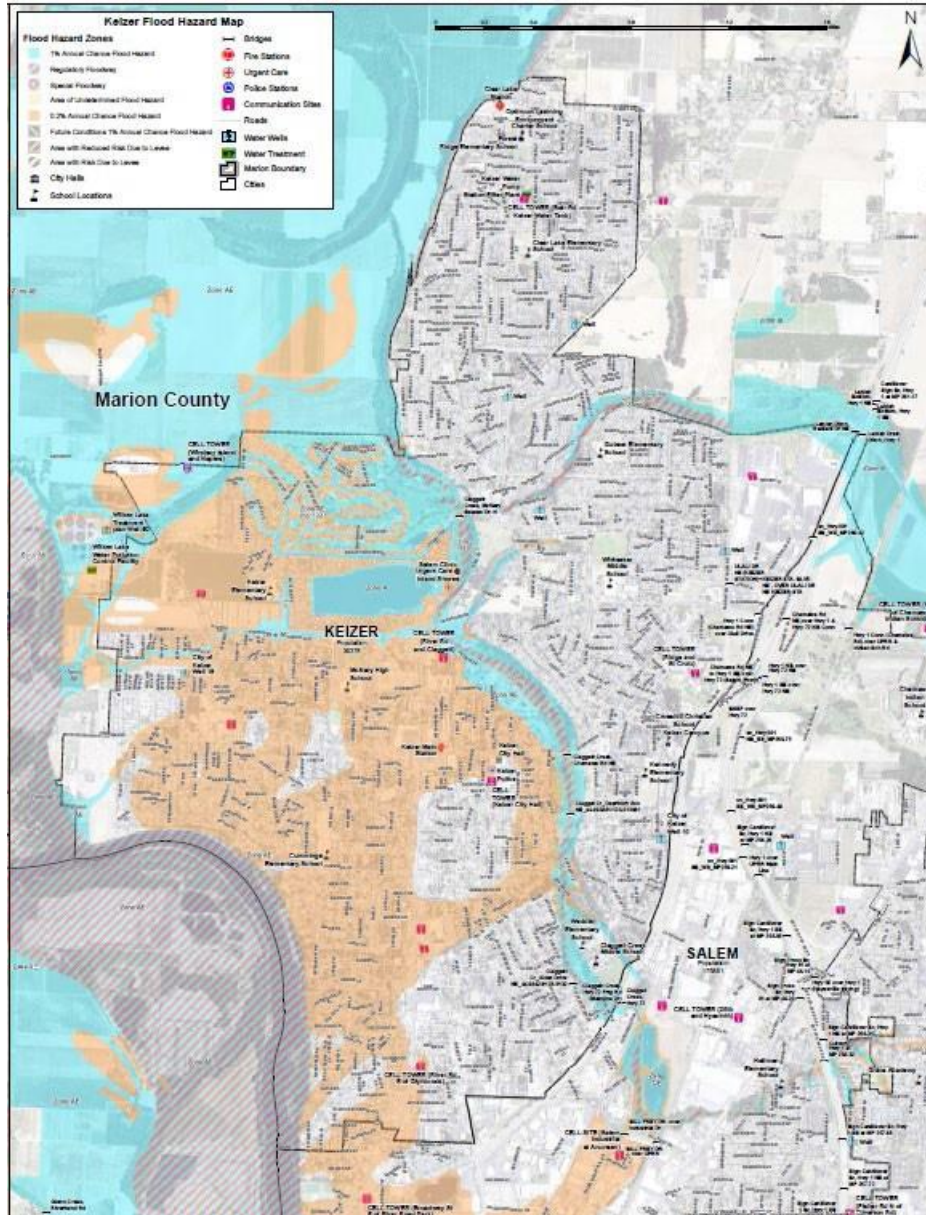
Events: None during the effective period of the previous plan (2017-2022)

Vulnerability: The probability for riverine flood in the Keizer Fire District service area is “likely” and the vulnerability to flood is “critical”. Committee members noted that ongoing FEMA flood map updates may increase the base flood elevation by roughly three feet. This is primarily related to an existing earthen dike and flood wall constructed along the Willamette River after the 1996 flood event. If the flood elevation increases, the wall will no longer be certifiable. Any breaching of the dike or wall would result in the inundation of the western half of Keizer.

Some minor flooding does occur on Claggett Creek. However, the flooding is generally isolated. A related mitigation success is the ongoing retrofit and upgrade of Dearborn Bridge over Claggett Creek.

Portions of Keizer have areas of flood plains (special flood hazard areas). These include areas along the Mary’s River (see Figure 9-3). Furthermore, other portions of Keizer, outside of the mapped floodplains, are also subject to significant, repetitive flooding from local storm water drainage.

Figure 9-3, City of Keizer Special Flood Hazard Area (FEMA flood map)



Source: DOGAMI Multi-Hazard Risk Report, 2022

9.9.6 Landslide

CPRI = 2.1, Risk Level: Moderate

Events: None during the effective period of the prior plan.

Vulnerability: The Keizer Fire District service area has a relatively flat topography, therefore probability for landslide is unlikely and vulnerability to landslide is negligible.

9.9.7 Severe Weather

CPRI = 2.4, Risk Level: Moderate

Windstorm

Events:

12/11/2021; High Wind; a strong Pacific front caused high winds along the coast and coast range, as well as strong winds through the Willamette Valley. Several reports of downed trees and branches as well as power outages for thousands of customers.

11/4/2021; Strong Wind; deep low-pressure system and associated front moved ashore brought high wind to the coast and windy conditions to the Willamette Valley.

1/12/2021; Strong Wind; a series of slow-moving fronts brought periods of heavy rain along with strong winds.

1/5/2019; Strong Wind; the Salem Airport ASOS recorded wind gusts up to 54 mph.

12/8/2018; Strong Wind; a strong low-pressure system over the Gulf of Alaska brought a strong cold front through. This generated strong winds across northwest Oregon. Reports of trees downed near McMinnville and a section of fence 3 miles WNW of Salem blown over.

4/7/2017; High Wind, Salem Airport recorded wind gusts up to 60 mph. There were reports of downed trees and power outages around Salem and Keizer.

Vulnerability: Significant wind events occur in Keizer each year. Damaging wind events are only slightly less common; once or twice per year the city will experience a windstorm event that will interrupt services, experience downed trees, and cause power outages.

Because windstorms typically occur during winter months, they are sometimes accompanied by ice, freezing rain, flooding, and very rarely, snow.

Winter Storm (Snow/ Ice)

Events:

12/25/2021; Heavy Snow; snow showers increased the night of the 25th, continuing through the 26th, resulting in significant travel issues for the holiday weekend. Around 4 to 8 inches of snowfall were reported.

2/11 to 2/13/2021; Ice Storm; this was a crippling ice storm for the Salem metro area where generally amounts of 0.5 to 1.25 inches of ice were reported, and many were without power for days.

1/26/2021; Winter Weather; light snow fell during the day as a front moved through the area. General amounts were 1 to 2 inches with local snow amounts of 3 inches. The snow ended in the evening.

3/5 to 3/6/2017; Heavy Snow, reports of 3.5 to 4 inches near Dallas/Falls City and 6 inches in McMinnville.

1/10 to 1/11/2017; Heavy Snow, 1 to 2 inches reported in the Salem area.

1/7 to 1/8/2017; Winter Storm with 1-2 inches of snow/sleet and 0.25 inches of freezing rain.

Vulnerability: Severe winter storms can consist of rain, freezing rain, ice, snow, cold temperatures, and wind. They originate from troughs of low pressure offshore that ride along the jet stream during fall, winter, and early spring months. Severe winter storms affecting the city typically originates in the Gulf of Alaska or in the central Pacific Ocean. These storms are most common from November through March.

Major winter storms can and have occurred in the Keizer Fire District service area, and while they typically do not cause significant damage, they are frequent and have the potential to result in calls for assistance to the district. The February 2021 ice storm was the most significant severe weather event in the recent past. The key impacts included widespread tree damage and power outages, and approximately 110,000 customers without power in Salem. Multiple road closures as well including Highway 99.

9.9.8 Tornado

CPRI = 2.4, Risk Level: Moderate

Events: None identified during the effective period of the prior plan.

Vulnerability: Vulnerability to damage by a tornado in the Keizer Fire District are due to the limited warning time (less than 6 hours) and the potential for effects to last up to a week in duration.

9.9.9 Wildfire

CPRI = 3.7, Risk Level: High

Events: There were no wildfires within the City of Keizer during the effective period of the prior plan. The wildfires that occurred in the foothills of the Cascades during September 2020 did impact the city with smoke.

Vulnerability: Keizer is located on the far western side of Marion County, surrounded by open farmland, waterways, or urban development. There are no forests within the city limits, and the closest forested area is Keizer Rapids Park, located half a mile west of the city. Due to its location, Keizer faces minimal risk of experiencing wildfires. There is no history of wildfire events in Keizer.

The County updated the Community Wildfire Protection Plan in 2016 and Keizer is not listed as a “Community at Risk.”

9.9.10 Volcano

CPRI = 2.1, Risk Level: Moderate

Events: No events in the city of Keizer during the effective period of the prior plan.

Vulnerability: Keizer is very unlikely to experience anything more than volcanic ash during a volcanic event. When Mt. Saint Helens erupted in 1980, the city was not impacted.

Please review the Risk Assessment (Volume I, Section 2) for additional information on these hazards.

9.10 Mitigation Strategy

During the 2022 Marion County Hazard Mitigation Plan and Keizer Fire District Addendum update process, Oregon Department of Land Conservation & Development and Keizer Fire District developed a list of priority actions. These actions were prioritized and then reviewed internally by staff and city council during the summer of 2022.

9.10.1 Action Item Pool

The following pages includes the Fire Districts initial Priority Action Items (Table 9.5).

Table 9-5, Keizer Fire District "Priority" Actions

#	Hazard	Mitigation Action/Description	Priority	Timeline	Cost	Coordinating Organization	Status
2022-MH-1	Multi-Hazard	Work with Marion County Emergency Management Coordinator to develop an Emergency Management Advisory Committee that could focus on joining county and local resources under a common incident command management system. Participate with Marion County to educate emergency managers, emergency managers and citizens, and to coordinate among cities and districts to develop a unified incident command management system.	H	1-3 Years	Staff Time	Develop agreements to form a FEMA incident management system; utilize common terminology; encourage relevant staff to take NIMS 100-800 Incident Command System courses; conduct tabletop exercises to practice the principles taught in these courses. The objective of unified Incident Command Systems is to coordinate State, county and local resources working together sharing resources efficiently.	New
2022-MH-2	Multi-Hazard	Reinstate the CERTs; involve citizens in coordination and communication at a neighborhood level to support Keizer Fire District and City of Keizer efforts to respond to natural hazard events.	H	1-3 Years		Citizen Emergency Response Teams involve citizens in providing support to other residents including provision of basic first aid, direction to access or evacuation routes and supporting the ability of the district and the city to coordinate block by block in a neighborhood.	New

Source: Personal communication with Chief Cowan, Keizer Fire District, April 11, 2022

10 City of Mill City

10.1 Purpose

This document serves as the City of Mill City’s Addendum to the Marion County Multi-Jurisdictional Hazards Mitigation Plan (HMP). The purpose of this addendum is to guide the implementation of mitigation actions by the City of Mill City to improve the resilience of the community. Please note that mitigation planning is a long-term endeavor—one that requires broad internal involvement and community engagement to be successful. Finally, please refer to the information contained in Volume I (Basic Plan) and Volume III (Appendices) of this HMP, which provides additional information (particularly regarding participation and mitigation strategy) and forms the basis of this addendum.

10.2 Plan Process, Participation, and Adoption

In 2021 and early 2022, Marion County partnered with the Oregon Department of Land Conservation and Development (DLCD) and the Oregon Military Department’s Office of Emergency Management (OEM), and Marion County cities, including the City of Mill City, to update their addendum to the Marion County Hazard Mitigation Plan, which expired August 16, 2022.

By developing this addendum to the Marion County HMP, locally adopting it, and having it approved by FEMA, the City of Mill City will gain eligibility for FEMA Hazard Mitigation Assistance (HMA) funding that includes three programs: Building Resilient Infrastructure & Communities (BRIC), formerly the Pre-Disaster Mitigation grant program, Hazard Mitigation Grant Program (HMGP), and the Flood Mitigation Assistance (FMA) program. This project is funded through the Federal Emergency Management Agency’s (FEMA) FY19 Pre-Disaster Mitigation Competitive Grant Program (PDMC-PL-10-OR-2019-003).

The City of Mill City joined the Marion County HMP update by executing an intergovernmental agreement with DLCD on 10/12/2021, fully executed by DLCD on 10/19/2021. On 10/7/2021, Mill City Mayor, Tim Kirsch and Mill City volunteer, Gary Olson, Marion County Emergency Preparedness Coordinator Mike Hintz, and DLCD Planner Tricia Sears conducted a risk assessment meeting with the Jurisdiction that included a Hazard Vulnerability Assessment ranking. City staff met again with DLCD on 3/25/2022 to update this addendum.

Mill City staff attended HMP Steering Committee meetings on 8/3/21, 9/7/21, 10/5/21, 11/21/21, 1/4/22, 3/1/22, 5/4/22, and promoted the HMP survey and outreach efforts throughout the plan update, including promotion through the city’s newsletter on February 1, 2022, and through public posting of the survey on the city’s website and Facebook page to distribute the public survey to interested parties in the Jurisdiction service area.

10.3 Risk Assessment

A risk assessment is intended to provide the “factual basis for activities proposed in the strategy to reduce losses from identified hazards” (Department of Homeland Security, Federal Emergency Management Agency, 2023). This section of the HMP addendum can serve as the factual basis for addressing Oregon Statewide Planning Goal 7 – Areas Subject to Natural Hazards.

10.4 Community Profile

This section provides information on city specific assets and populations. For additional information on the characteristics of Jurisdiction, in terms of geography, environment, population, demographics, employment and economics, as well as housing and transportation see Volume III, Appendix B, *Community Profile*. Many of these community characteristics can affect how natural hazards impact communities and how communities choose to plan for natural hazard mitigation. Considering the city specific assets during the planning process can assist in identifying appropriate measures for natural hazard mitigation.

10.4.1 Community Characteristics

Mill City is nestled along the North Santiam River. The northern third of Mill City and the Hwy 22 corridor are located north of the river in Marion County. The remainder of the city, including most of the residential areas, schools, fire station and city offices are located south of the Santiam River in Linn County. Mill City is the largest community in the North Santiam River Canyon with a population in 2020 of 1,971 (U.S. Census Bureau, 2022).

With an elevation of 827 feet, the climate of Mill City is moderate; the average monthly temperatures range from 51 – 79 degrees in July and August, and 33-45 degrees in December and January. Mill city receives approximately 60-70 inches of rain, and 6-12 inches of snow each year. The city’s topography is relatively flat but does possess terrain attributed to the North Santiam River. Outside of city limits, steep slopes surround the city on the North and South sides.

Mill City benefits from its location along Oregon Hwy 22, a major east-to-west transportation route connecting Salem to Bend. The city serves as a local small business, education, and service center for residents of the North Santiam Canyon and the traveling public along the Hwy 22 corridor. The existing business types include hospitality, restaurants, professional, financial, real estate, service stations, repair/service shops, and personal service businesses; primarily serving the daily needs of residents. (Timber is the largest industry).

10.5 Critical and Important Facilities/Infrastructure

10.5.1 Communication/Information Technology

There are currently two communications providers operating in Mill City. Astound and Zippy provides broadband services and phone services. However, Zippy's capabilities are limited as they have a limited fiber infrastructure along Hwy. 22.

Strengths

- Fiber internet infrastructure already present along Hwy 22.
- Zippy is currently installing fiber gig speed internet in Mill City (to be completed in 2022) and other communities throughout the Santiam Canyon.
- Cellular Tower (T-Mobile) near 155 NE Santiam Blvd.
- ATT cell tower on Potato Hill.

Weaknesses

- Phone/Fiber lines may cross over 1st Ave. bridge.
- Currently limited certified HAM radio operators.
- No landline phone available if power is out to Zippy or Astound.

10.5.2 Water

The City of Mill City has two municipal wells (Kingwood Wells 1 & 2) and a water pump station located at SE 4th and SE Kingwood Avenue. The two wells were drilled to a depth of 168 feet. Well 1 has the capacity to produce 800 gpm and Well 2 has the capacity to produce 450 gpm (City of Mill City, N.d.). Both wells are near each other, pulling water from depths of 45-158 feet deep from the same aquifer.

The city municipal water system currently depends on these wells to distribute water throughout the community. Unless other water facilities are created to pull water from the North Santiam, Mill City must preserve the well head protection area from any possible pollution attributed to encroaching development.

10.5.3 Wastewater

Mill City's has a municipal wastewater treatment facility and collection system. Individual homes are served by a STEP (Septic Tank Effluent Pumping) system. The building sewer from a home or business drains to an interceptor tank located on the property. Solids are collected in the interceptor tanks and the liquids are discharged into the city's sewer collection system. The liquid effluent flows to the City's wastewater treatment facility where it goes through a rock filtration system and is discharged into a large drain field. The City contracts with a private firm to pump out the interceptor tanks at each home or business. Residential interceptor tanks are pumped on a 7-10-year cycle, with tanks serving businesses or heavy water users pump on a more frequent basis.

10.5.4 Dams

Two dams sit above Mill City, Detroit Dam and Big Cliff Dam. Federal officials and Marion County's Emergency Managers have previously concluded that the likelihood of Dam Failure is Low. Current conditions still represent the previous decision. If dam failure occurred in either dams, Mill City would experience catastrophic impacts from a surge of water expelled from either Detroit or Big Cliff Lake.

Strengths:

- (2) Municipal wells (Kingwood 1 &2)
- (1) Backup diesel generator on-site
- (2) Above-ground water storage reservoirs at 155 NE Santiam Blvd (Marion County side of river) and SE 4th Avenue (Linn County side of river))
 - Equivalent to (1.5 million) gallons or 3-5 days of water storage
- Municipal wastewater treatment system
- (3) sewage pump stations with backup generators

Weaknesses:

- No current way to access storage supply of diesel fuel at local gas station or local timber companies if power is out
- Main water lines cross highway & pedestrian bridge
- Main wastewater line crosses 1st Ave. bridge

10.5.5 Transportation System

Oregon Hwy 22 is the major transportation route for auto, public transit, and emergency vehicle access throughout the Santiam Canyon. Mill City is located along Hwy 22, 30 miles east of the Interstate-5, the City of Salem, and the remainder of the Willamette Valley. To the east, Hwy 22 connects to Gates, Detroit, Idanha, and ends at the Santiam Pass interchange with U.S. Route 20/Oregon Hwy 126, which continue east to the Central Oregon cities of Sisters, Redmond, and Bend.

The Cherriots Canyon Connector is the only existing public transit service serving communities in the North Santiam Canyon. The Canyon Connector route has three total round trips with buses running approximately every (5) hours.

In case of the closure of Oregon Hwy 22, Mill City residents will have to rely on alternate routes to reach supplies or safety in the Willamette Valley. Lyons-Mill City Drive runs from Mill City to Lyons, where it connects to OR 226 and Hwy 22.

Table 10-1, Bridges in Mill City

Structure Name	Construction	Location	Owner	Year Built	Structural Condition
Little North Fork Santiam River Bridge (Hwy 22)	Steel/Concrete	Mehama	ODOT	1952	Fair
North Santiam River Railroad (Pedestrian) Bridge	Steel/Concrete	Mill City	Mill City	1919	Good; 10,000 lb. capacity – Updated 2021/2022
Mill City Bridge 1 st Ave. (over N. Santiam River)	Steel/Concrete	Mill City	Linn County	1960	Completely updated in 2020-2021; meets all new code requirements; previously sufficient rating of 32.1
Gates Bridge (Over N. Santiam River)	Unknown	Gates	Unknown	Unknown	Unknown
OR 226 Bridge (Over N. Santiam River)	Unknown	Lyons	Unknown	Unknown	Unknown

Source: City of Mill City, Oregon (2021)

***Note** - There are three bridges across De Ford Creek and Rock Creek located in Linn County in or adjacent to Mill City on Lyons-Mill City Road across De Ford Creek, and Kingwood Avenue across both. Sufficiency ratings for all three are in 97, 96.9 and 68.8.

Strengths:

- The Pedestrian Bridge owned by Mill City and updated in 2021/2022 could be used by some light duty emergency vehicles weighing no more than 10,000 lb.
- First Avenue bridge has been completely updated in 2021/2022 which removed weight restrictions.
- Lyons/Mill City Drive serves as an additional evacuation route to Lyons (west).
- SE Kingwood Avenue serves as an additional evacuation route to Gates (east).
- Bridges over the N. Santiam River in Gates and Lyons provide an alternative route for Mill City traffic if problems occur on the 1st Avenue bridge in Mill City.

Weaknesses:

- Linn County no weight restrictions, see “Strengths Above”.
- Pedestrian Bridge s has just gone through extensive restoration and operates under more stringent weight restrictions (10,000 lbs).
- Hwy 22 closures could make travel outside of North Santiam Canyon more lengthy.

10.5.6 Energy and Utilities

Mill City receives energy and utility services from Pacific Power and NW Natural Gas. The main power service line to Mill City comes from Lyons to Mill City, along Lyons-Mill City Drive. It was rebuilt in 2015-2016.

BPA transmission lines run south of Mill City from the Detroit Dam generating turbines, connecting to the Lyons power station.

Table 10-2, Fuel Storage Sites

Location	Owner	Fuel Type	Capacity (in gallons)
Mill City – Hwy 22	Mobile Gas Station,	Diesel / Gasoline (Below Ground)	17,000 of gas 3,000 of diesel
Mill City – Hwy 22	Union 76 Gas Station	Diesel / Gasoline (Below Ground)	40,000 of gas 7,500 of diesel
Lyons – Lumber Plant	Freres Lumber	Diesel (Above Ground)	10,000 of diesel
Mill City – Lumber Plant	Frank Lumber	Diesel (Above Ground)	2 x 20,000 tanks of diesel
Mill City – Lumber Plant	Frank Lumber	Gasoline (Above Ground)	20,000 of gas

Strengths:

- Gas stations with fuel storage exist within Mill City.
- Businesses including Freres Lumber and Frank Lumber Co. possess fuel storage.

Weaknesses:

- Gas stations possess below ground tanks which cannot be pumped without electricity.
- Gas stations do not currently possess backup diesel generators to pump fuel from storage tanks.
- No alternate sources of energy (wind, solar) exist to power basic services.

10.5.7 Agriculture and Food

Mill City has a small 10,000 sf grocery store, the Mill City Marketplace, convenience stores, Dollar General and three restaurants plus a coffee house to provide groceries and food services. The closest full-service grocery is 17 miles west in Stayton. The closure of Hwy 22 as a transportation route would cause some concern for residents and food accessibility.

Strengths:

- Private sector entities which possess limited (1-2 days) food supplies.
- Agricultural land availability near Mill City.

Weaknesses:

- No major (full service) grocery store inside of city limits.
- Surrounding agriculture is currently not used for food production.

10.5.8 Banking and Finance

A U.S Bank exists on the north side of the North Santiam River in Mill City. The bank is located along Hwy 22 and could be utilized for emergency financial services during a hazard event.

Strengths:

- Presence of a banking/financing institution within city limits.

Weaknesses:

- Full “urban” financial services unavailable.

10.5.9 Hazardous Materials

Mill City does not possess any large manufacturing firms that possess hazardous materials. The city has identified hazardous materials releases through the Oregon Department of Environmental Quality which may be susceptible to leaching including the Texaco gas station and Remine Mill site.

Strengths:

- There are currently not enough known hazardous materials to cause major concern.
- Brownfield sites could be utilized and attract private sector development.

Weaknesses:

- Current brownfields may be susceptible to leaching of unknown materials.

10.5.10 Emergency Services

Mill City receives emergency services from Linn County Sheriff's Office and the Mill City Rural Fire Protection District.

- Fire: Mill City Volunteer Fire Dept: 400 SW 1st Ave. Mill City, OR 97360 – (503) 897-2309
- Police: Mill City Contracts with Linn Co. Sheriff, Albany OR – Non-Emergency ((800) 884-3911
- Public Works: 475 Kingwood Ave. Mill City, OR 97360 - (503) 930-8256 Supervisor
- CERT: N/A
- Medical: Santiam Medical Clinic, 280 1st Ave Mill City, OR 97360 - (503) 897-4100
- Emergency Operations Center: N/A

Strengths:

- Mill City possesses community specific emergency services for fire and law enforcement.
- The Mill City RFPD main fire station possesses a backup generator.

Weaknesses:

- Emergency services do not have trained HAM radio operators.
- Emergency services do not possess rescue rafts for North Santiam River access.

10.5.11 Government Facilities

Mill City's City Hall contains the office space for the administration, finance, permits, planning, public works, municipal court and also serves as the Mill City Sheriff substation.

- City Hall: 444 SW 1st Avenue, Mill City, Oregon 97360 (503) 897-2302.
- Mill City Post Office: 101 SE Kingwood Avenue.

Strengths:

- City Hall may be utilized as a shelter or emergency response center.

Weaknesses:

- City Hall does not possess a backup diesel generator to power facility in the event of a power outage.

10.5.12 Environmental / Historical Preservation Sites

Mill City is surrounded by environmental preservation sites including state parks and designated wilderness areas. 50% of the housing stock in Mill City was built before 1950. The Hinkle-Reid house located at 525 NE Alder St. was built in 1916. It is the only structure in Mill City listed on the National Register of Historic Places. There are four other structures listed on the City's local historic resource inventory, including a wrought iron Phoenix column railroad bridge on timber trusses that crosses the North Santiam River at 1st Avenue in Mill City. The railroad bridge was originally constructed in 1888, and then moved up to Mill City in 1919. The bridge remained in railroad use until 1967 and was refurbished for pedestrian use in the mid - 1990's. The City of Mill City has created a recreational trail on the abandoned railroad right of way through the City, with the refurbished railroad bridge as its focal point. In 2019, the community repainted and refurbish the bridge to celebrate its centennial.

Strengths:

- Proximity to pristine state and federal land could attract residents or business.
- Buildings of historical significance are located within city limits.
- History and "timber" character provided by Mill City pedestrian bridge.

Weaknesses:

None identified.

10.5.13 Education

Mill City is home to the Santiam Canyon School District. This district encompasses four cities in the Santiam Canyon including Mill City, Gates, Detroit and Idanha. All of the district's schools, the Early Childhood Center, the Santiam Elementary School, and the Santiam Jr./Sr. High School, are located in Mill City.

- Santiam Canyon School District, #129J
 - Santiam Early Childhood Center, 319 SW 3rd Ave, Mill City OR 97360
 - Santiam Elementary School, 450 SW Evergreen St. Mill City, OR 97360 (503) 897-2368
 - Santiam Jr./Sr. High School, 300 SW Cedar St. Mill City, OR 97360 (503) 897- 2311

Santiam Canyon School District has made several large upgrades in the last few years to update facilities, expand programming and square footage, and improve safety measures. This work has largely been paid for by the passage of a community voted school bond and through competitive state grants.

Santiam Elementary School has a locked campus with single entry point security, where patrons must be buzzed into the locked doors to enter the school. This campus now has a service facility for food and a new parking lot that nearly tripled the parking and made for better pickup and drop-off traffic flow.

Santiam Junior/Senior High School has seen significant change in the past few years. It, too, is a locked campus with single entry point security. The old high school was demolished and replaced with three new school buildings, modernizing the educational space, improving the learning environment, and adding a significant amount of new space. Along with the new school, an additional auxiliary gymnasium was added, to complement the existing large main gymnasium. Additionally, the existing gymnasium and auditorium were seismically retrofitted, adding them to our list of buildings that meet current life safety standards. All district buildings now meet current seismic standards for life safety.

Strengths:

- School facilities could be utilized to shelter a large amount of community residents including functional needs populations. Currently have an MOU with American Red Cross and Linn County for sheltering.
- School facilities already possess needed infrastructure for a shelter which includes restrooms, showers, and a kitchen.
- School buses could be utilized for transportation after a hazard event.

Weaknesses:

- There are no current agreements or MOUs between the city and school district to utilize facilities after a hazard event.
- There is no backup generator to heat, cool or prepare and store food in case of a power outage.

10.5.14 Healthcare and Public Health

Santiam Memorial Hospital operates a satellite medical clinic in Mill City. The clinic provides outpatient services for residents. The Santiam Memorial Hospital in Stayton and its adjacent medical clinics provide outpatient, surgery center, birthing services, and in-patient medical care.

- Santiam Medical Clinic, 280 S. 1st Ave. Mill City, Oregon

Strengths:

- A clinic with out-patient services exists within the community.
- Emergency Medical Services (EMS) provider is in Lyons, approximately 7 miles away and provides 24-hour response. Santiam Hospital located in Stayton, Oregon approximately 17 miles away also provides EMS to Mill City.

Weaknesses:

- No facilities with major life-saving equipment currently exist within city limits.
- No local EMS Transporting agencies
- Emergency health supplies are limited to what exists within the community.

10.5.15 Access and Functional Needs (Vulnerable Populations)

Mill City’s vulnerable population consists of the elderly and those that are medically dependent and require life safety equipment. In 2020, 15% of Mill City’s residents were elderly, 65 years of age or older (U.S. Census Bureau, 2022).

Strengths:

- Nearly 41.5% of residents are over the age of 45 based on 2020 American Community Survey data, this older populous can volunteer and promote cohesion in the community (U.S. Census Bureau, 2022).

Weaknesses:

- There are no assisted living or full-service medical care facilities to serve the aging population.

10.5.16 Plans and Policies

Table 10-3, City of Mill City Plans and Policies

Document	Year
Mill City Comprehensive Plan update	2015
Water System Master Plan	2003
Parks Master Plan	2014
Buildable Lands Assessment Update	2012

Table 10-4, City of Mill City Hazard Profile

Community Overview							
Community Name	Population	# Of Buildings	Critical Facilities ¹	Total Building Value (\$)			
Mill City	1,915	1,269	3	293,237,000			
Hazus-MH Analysis Summary							
Hazard	Scenario	Potentially Displaced Residents	% Potentially Displaced Residents	Damaged Buildings	Damaged Critical Facilities	Lost Estimate (\$)	Loss Ratio
Flood ²	1% Annual Chance	0	0%	0	0	0	0%
Earthquake	Mt. Angel Mw 6.8 Deterministic	5	0.3%	17	0	4,876,531	1.6%
Exposure Analysis Summary							
Hazard	Scenario	Potentially Displaced Residents	% Potentially Displaced Residents	Exposed Buildings	Exposed Critical Facilities	Building Value (\$)	Exposure Ratio
Landslide	High and Very High Susceptibility	126	6.6%	78	0	19,040,000	6.4%
Channel Migration	Channel Migration Zone	196	10%	72	0	25,451,000	8.5%
Wildfire	High and Moderate Risk	260	14%	171	2	38,745,652	13%
Lahar	Medium Zone (1000 to 15000 – Year)	1,604	84%	1,069	3	245,855	82%
¹ Facilities with multiple buildings were consolidated into one building complex. ² No damage is estimated for exposed structures with “First floor height” above the level of flooding (base flood elevation).							
Critical Facilities							
Critical Facilities by Community	Flood 1% Annual Chance	Earthquake Moderate to Complete Damage	Landslide High and Very High Susceptibility	Channel Migration Zone	Wildfire High or Moderate Risk	Lahar Hazard	
	Exposed	>50% Prob.	Exposed	Exposed	Exposed	Exposed	
Mill City RFPD – Main Station					X	X	
Santiam Elementary					X	X	
Santiam JR SR High School						X	

10.6 Hazard Analysis

The methodology for assessing risk was the same for all jurisdictions and a detailed description of the BOLD planning methodology can be found in Volume I, a brief description is below. To complete the risk assessment, the jurisdiction representatives first updated the description, type, location, and extent of each hazard. Next, they updated the Hazard Vulnerability Analysis based on each hazard’s potential impact on the community using a calculated priority risk index (CPRI) methodology developed by BOLD Planning8. This assessment method ranks the following factors to determine risk from the range of natural hazards identified:

1. Probability (frequency) of event.
2. Magnitude of event.
3. Expected warning time before event.
4. Expected duration of event.

The table below shows the scoring values for each ranking category.

Score	Probability	Warning Time	Magnitude/Severity	Duration
4	Highly Likely	Less than 6 hours	Catastrophic	More than 1 week
3	Likely	6-12hours	Critical	Less than 1 week
2	Possible	12-24hours	Limited	Less than 1 day
1	Unlikely	24+hours	Negligible	Less than 6 hours

The assessment identifies three levels of risk: High, Moderate and Low.

High - High probability of occurrence; at least 50 percent or more of population at risk from hazard; significant to catastrophic physical impacts to buildings and infrastructure; major loss or potential loss of functionality to all essential facilities (hospital, police, fire, EOC and shelters).

Moderate - Less than 50 percent of population at risk from hazard; moderate physical impacts to buildings and infrastructure; moderate potential for loss of functionality to essential facilities.

Low - Low probability of occurrence or low threat to population; minor physical impacts.

IMPACT	Range Values	
	Low CPRI	High CPRI
High	3.0	4.0
Moderate	2.0	2.9
Low	1.0	1.9

A summary of the risk assessment findings and rankings for the City of Mill City is presented below.

Hazard Profile Summary City of Mill City Using BOLD Planning Analysis Scoring						
Non-Natural Hazard	Probability	Warning Time	Magnitude	Duration	CPRI	2022 Local Planning Significance
Weight Factor	0.45	0.15	0.3	0.1		
Wildland Interface Fire	3.5	3	3.5	3.5	3.4	High
Severe Weather/Storm	4	1.5	3	3.5	3.3	High
Extreme Weather - High Temperature	3.5	1	3	4	3.0	High
Drought	3	1	3	4	2.8	Moderate
Earthquake	2	4	3	4	2.8	Moderate
Landslide	2	4	2	3	2.4	Moderate
Flood*	1	2	3	3	2.0	Moderate
Volcanic Eruption	1	1	3	3	1.8	Low
Avalanche**	1	4	1	1	1.5	Low
Tornado***	1	1.5	1	1	1.1	Low

Source: BOLD Planning Risk Assessment Method; Analysis by Marion County Emergency Management and the City of Mill City on March 25, 2022. *Including dam failures; **New in 2021; ***Split out from Severe Weather in 2021.

Table 10-5, City of Mill City Hazard Vulnerability Assessment – Other Hazards

Hazard Profile Summary for the City of Mill City Using BOLD Planning Analysis Scoring						
Non-Natural Hazard	Probability	Warning Time	Magnitude	Duration	CPRI	2022 Local Planning Significance
Weight Factor	0.45	0.15	0.3	0.1		
Hazardous Materials Release - Transportation	3	4	3	3.5	3.2	High
Terrorism/Active Shooter/Workplace Violence	2	4	4	4	3.1	High
Public Health	3	1	3	4	2.8	Moderate
Chemical, Biological, Radiological, Nuclear, Explosive	1	4	4	4	2.7	Moderate
Cyberterrorism	2	4	2	4	2.5	Moderate
Fire - Residential / Commercial (Arson)	2	4	2	4	2.5	Moderate
Hazardous Materials – Non-Transportation	2	4	2	4	2.5	Moderate
Unauthorized Entry	2	4	2	3	2.4	Moderate
Agricultural Terrorism	1	1	3	4	1.9	Low

Source: BOLD Planning Risk Assessment Method; Analysis by Marion County Emergency Management and the City of Mill City on March 25, 2022.

10.7 Hazard Characteristics

Hazard History, Characteristics and Extent for Marion County apply also to the City of Mill City. Volume I, Section 2, Risk Assessment, adequately describes the characteristics of natural hazards, as well as the location and extent of potential events. This section identifies vulnerabilities specific to Mill City, recent localized hazard events and impacts, and illustrates the basis for the city’s HVA scores.

10.7.1 Avalanche

CPRI = 1.5, Risk Level: Low

Events: N/A

Vulnerability: None

10.7.2 Drought

CPRI = 2.8, Risk Level: Moderate

Events: Governor Kate Brown declared a drought emergency for all of Marion County in September 2015.

Vulnerability: Dryer conditions in the summer months have impacted the North Santiam Canyon as a whole, including the area around Mill City. During the 2015 drought, 2019 wildfires and 2020 extreme heat, many trees and vegetation died off which created increased risk of wildfire hazards.

10.7.3 Earthquake

CPRI = 2.8, Risk Level: Moderate

Events: Mill City experienced a crustal earthquake on August 19, 1961. A 4.5 magnitude earthquake struck 6 miles from Mill City, with shaking felt throughout the Santiam Canyon, up to Detroit.

Figure 10-1, Cascadia Earthquake Expected

Events: Mill City experienced a crustal earthquake on August 19, 1961. A 4.5 magnitude earthquake struck 6 miles from Mill City, with shaking felt throughout the Santiam Canyon, up to Detroit.

Vulnerability: If another larger and more substantial earthquake occurs (i.e., Cascadia), Mill City is expected to experience damage to buildings, utility (electric power, communications, water, wastewater, natural gas) and transportation systems (roads, bridges, pipelines),

10.7.4 Flood

CPRI = 2.0, Risk Level: Moderate

Events: None since 2017.

Historically, Mill City experienced minor flooding events in 1964 and 1996. This was due to a specific weather pattern named “pineapple express”, which blows warm, moist air from the southwest into the Pacific Northwest.

Vulnerability: The City of Mill City is located approximately 10 miles downstream of the Big Cliff and Detroit dams. The U.S. Army Corps of Engineer regulates water levels behind the dams and manages discharges to prevent downstream flooding. Therefore, the N. Santiam River near Mill City rarely sees more than minor flooding.

The City's drinking water is pulled from an aquifer, and thus, high and dirty river levels do not impact those facilities.

10.7.5 Landslide

CPRI = 2.4, Risk Level: Moderate

Events: None since 2017.

Historically, Mill City has not experienced major impacts from landslides within city limits. Areas near Hwy 22 and the northern edge of the city are more susceptible to this hazard because of steep slopes. Debris flows can occur in the Snake/Deford creek channels, as they did in the 1964 flood event.

Vulnerability: Potential landslide-related impacts are adequately described within the county's plan, and include infrastructural damage, economic impacts due to isolation and/or arterial road closures, property damage, and obstruction to evacuation routes.

10.7.6 Volcano

Hazards from volcanic eruptions include both ash and lahar.

Events: None since 1980, which was the year of the Mount St Helens eruption.

Vulnerability: Mill City has not been impacted previously by volcanic activity, and the city would have 6 to 12 hours before ash from an eruption of Mt. Hood or Mount Jefferson impacted the community; impacts could last more than a week.

The city's risk of damage from a lahar following an eruption of Mt. Jefferson is substantial. Most of the 350,000 residents in the county are not exposed to the Lahar hazard, but the hazard poses significant concerns for those closer to Mount Jefferson and those within the distal riverine valley. The communities most threatened from a volcanic eruption and lahar event are Gates, Detroit, Idanha, and Mill City.

10.7.7 Wildfire

Events: September 2020, the Beachie Creek fire burned 193,565 acres of land in Linn, Marion and Clackamas counties including portions of the City of Mill City.

Vulnerability: During the wildfire, evacuation routes were restricted due to wildfire movement. Following the wildfire, the impact of smoke and poor air quality affected residents who remained in the area. Long term impacts to the local economy persist. Marion County updated the Community Wildfire Protection Plan (CWPP) in 2023, which mapped wild land urban interface areas and developed actions to mitigate wildfire risk. The city is a participant in the CWPP and has included hazard mitigation action items in this plan that are directly in line with the CWPP actions.

10.7.8 Severe Weather

Windstorm

Events: September 2020, strong easterly wind was one of the principal factors in the speed with which the wildfires spread across the foothills of the Cascades.

Vulnerability: About once or twice per year the city will experience a windstorm event that can interrupt services, down trees, and cause power outages. Because windstorms typically occur during winter months, they are sometimes accompanied by ice, freezing rain, flooding, and very rarely, snow.

Winter Storm (Snow/Ice)

Events: Not reported during assessment

Vulnerability: Ice storms can down power lines and can cause the city to lose power for 2-3 days. In 2014, a similar storm knocked down tree's and caused hazardous road conditions. These types of storms are more frequent and usually cause transportation issues and communication failures from phone lines downed by falling trees and icy/snow filled roads.

10.8 Mitigation Strategy

This section of the HMP addendum addresses 44 CFR 201.6(c)(3(iv), *Mitigation Strategy*. During the 2022 HMP update, the Mill City representative and DLCN Natural Hazards Planner,

Katherine Daniel evaluated the Action Items noting what accomplishments had been made, and whether the actions were still relevant; any new action items were identified at this time. In 2016, Mill City developed a list of two priority actions (Table A-1 in the prior plan).

The first of these priority actions was completed. Review the Natural Resource Chapter of the Comprehensive plan document and modify policies to reflect new hazard information.

The second of the 2016 priority actions were retained and revised to develop a more comprehensive energy assurance plan. These include Multi-hazard Action Items #MH 3 and MH 8.

10.8.1 Priority Actions

Priority Actions for the 2022 Mill City HMP Addendum center around ensuring that power is available to run an emergency refuge or shelter, maintain city water and

wastewater service using generators and fuel stored locally to address the needs of citizens in the event of an Excessive Heat emergency, when there are pre-emptive power shut-offs due to high wildfire hazard and high wind events.

The table below (Table,10-6) lists all mitigation action items and identifies a whether the action is in-progress, Started, or not started.

Many actions are carried forward from prior versions of the Marion County HMP and other local planning documents including the Community Wildfire Protection Plan, Drought Contingency Plan, and Mid-Willamette Economic Development study. Notably, given the location of Mill City, collaboration with both Marion County and Linn County will be required during the implementation process.

Table 10-6, Mill City Mitigation Action Items

#	Hazard	Mitigation Action/Description	Priority	Timeline	Cost	Coordinating Organization	Status
2022-EQ-1	Earthquake	Promote Great Oregon Shakeout Awareness month in October. Participate in activities for schools, business, and industry. Participating with the Mid- Willamette Emergency Communications Collective on initiatives that are focused on household preparedness.	H	Annually	Staff Time	Mill City	In-progress
2022-MH-1	Multi-Hazard	Develop an Energy Assurance Plan. (Multi-Hazard 2-4)	L	1-3 Years	Staff Time	Mill City	In-progress
2022-MH-2	Multi-Hazard	Develop and better utilize early warning system with possibly using multiple siren towers and PA system.	M	1-3 Years	TBD	Mill City	New
2022-MH-3	Multi-Hazard	Evaluate the diesel generation power needed for critical city facilities. Acquire a mobile backup diesel generator, trailer, and necessary generator hookups, capable of powering city facilities and fueling stations for a minimum of 3 days.	M	1-3 Years	TBD	Mill City	In-progress
2022-MH-4	Multi-Hazard	Assess the short- and long-term needs for sheltering access and functional needs populations for all hazards.	M	1-3 Years	Staff Time	Mill City	New
2022-MH-5	Multi-Hazard	Obtain portable generator and necessary electrical hookup for School District to power gym's cooling/heating & cafeteria.	L	1-3 Years	TBD	Mill City	New
2022-MH-6	Multi-Hazard	Develop and MOU with Canyon Senior Center for cooling/heating station during and after hazard event.	L	1-3 Years	TBD	Mill City, Canyon Senior Center,	New

#	Hazard	Mitigation Action/Description	Priority	Timeline	Cost	Coordinating Organization	Status
2022-MH-7	Multi-Hazard	Develop and MOU with Santiam Outreach Community Center (SOCC) for cooling and Heating during hazard events	L	1-3 Years	TBD	Mill City, Santiam Outreach Community Center	New
2022-MH-8	Multi-Hazard	Develop a MOU with the Santiam School District to utilize generator and facilities for refuge or sheltering of residents during a hazard event.	L	1-3 Years	TBD	Mill City	New
2022-MH-9	Multi-Hazard	Develop a MOU with First Student to utilize buses during/after hazard events	L	1-3 Years	TBD	Mill City	In-progress
2022-MH-10	Multi-Hazard	Establish a Mill City CERT team.	L	1-3 Years	Staff Time	Mill City	New
2022-MH-11	Multi-Hazard	Develop a community education program - such as an all-hazard community outreach forum for students and residents. *	L	1-3 Years	Staff Time	Mill City	Retained
2022-MH-12	Multi-Hazard	Expand auxiliary radio capabilities by developing a team of HAM Radio operators for EMS and interested public.	L	1-3 Years	Staff Time	Mill City	New
2022- MH-13	Multi-Hazard	Explore need for 'Opt-In' form on City website for those in need of help in evacuating, along with all needed equipment (walkers, wheelchairs, oxygen	L	1-3 Years	Staff Time	Mill City	New
2022-MH-14	Multi-Hazard	Explore & create MOU for early warning system for all citizens using School District parent/student notification program. Email, phone, text.	L	1-3 Years	Staff Time	Mill City	New
2022-MH-15	Multi-Hazard	Obtain portable electronic signs for evacuation routes. Create MOU with Chamber of Commerce to place evacuation routes on electronic reader board on Hwy 22. Same with Santiam School District for electronic reader board at City Hall.	L	1-3 Years	TBD	Mill City	New

#	Hazard	Mitigation Action/Description	Priority	Timeline	Cost	Coordinating Organization	Status
2022-DR-1	Drought	Monitor economic impacts on recreation, tourism, and agriculture communities.	M	1-5 Years	NA	Mill City	In-Progress
2022-FL-1	Flood	Create partnerships and strategic plans with NSWC to facilitate riparian habitat restoration projects in flooding or erosion prone areas (e.g., Areas subject to reoccurring flood events –Elizabeth, Cedar, Deford, and Snake Creeks.)	M	1-5 Years	Staff Time	Mill City / Marion County Environmental Services	In-Progress
2022-DR-2	Drought	Collaborate with NSWC to complete WMCP’s and improve community understanding of water usage and opportunities to increase efficiencies.	M	1-5 Years	Staff Time	Mill City	In-Progress
2022-MH-16	Multi-Hazard	Repair retaining wall on North Santiam Riverbank and develop recreational access dock to leverage retaining wall repair costs.	M	1-5 Years	TBD	Mill City	In-Progress
2022-MH-17	Multi-Hazard	Designate evacuation routes outside of Hwy 22 for EMS. Add flood warning signs.	M	1-5 Years	TBD	Mill City	In-Progress; Flood signs installed
2022-MH-18	Multi-Hazard	Collaborate with Marion County to connect to a more resilient regional water/sewer system.	M	1-5 Years	TBD	Mill City	In-Progress
2022-WF-1	Wildfire	Collaborate with Detroit Ranger District, ODF, and BLM to conduct fuel hazard reduction along the Wildland Urban interface.	H	1-5 Years	TBD	Mill City	In-progress

#	Hazard	Mitigation Action/Description	Priority	Timeline	Cost	Coordinating Organization	Status
2022-WF-2	Wildfire	Collaborate with ODF and Mill City RFD to develop strategic community fuel breaks along Hwy 22, Sitcum road, and Bud Long.	H	1-5 Years	TBD	Mill City	In-progress
2022-LS-1	Landslide	Integrate new DOGAMI landslide hazard information into land use zoning/development codes.	L	1-5 Years	Staff Time	Mill City	In-Progress

Source: City of Mill City

11 City of Mt. Angel Addendum

11.1 Purpose

This document serves as the City of Mt. Angel’s Addendum to the Marion County Multi-Jurisdictional Hazards Mitigation Plan (HMP). The purpose of this addendum is to guide the implementation of mitigation actions by the City of Mt. Angel to improve the resilience of the community. Please note that mitigation planning is a long-term endeavor—one that requires broad internal involvement and community engagement to be successful. Finally, please refer to the information contained in Volume I (Basic Plan) and Volume III (Appendices) of this HMP, which provides additional information (particularly regarding participation and mitigation strategy) and forms the basis of this addendum.

11.2 Plan Process, Participation, and Adoption

In 2021 and early 2022, Marion County partnered with the Oregon Department of Land Conservation and Development (DLCD) and the Oregon Department of Emergency Management (OEM), and Marion County cities, including the City of Mt. Angel, to update their addendum to the Marion County Hazard Mitigation Plan, which expired August 16, 2022.

By developing this addendum to the Marion County HMP, locally adopting it, and having it approved by FEMA, the City of Mt. Angel will gain eligibility for FEMA Hazard Mitigation Assistance (HMA) funding that includes three programs: Building Resilient Infrastructure & Communities (BRIC), formerly the Pre-Disaster Mitigation grant program, Hazard Mitigation Grant Program (HMGP), and the Flood Mitigation Assistance (FMA) program. This project is funded through the Federal Emergency Management Agency’s (FEMA) FY19 Pre-Disaster Mitigation Competitive Grant Program (PDMC-PL-10-OR-2019-003).

The City of Mt. Angel joined the Marion County HMP update by executing an intergovernmental agreement with DLCD on October 5, 2021. On October 13, 2021, City of Mt. Angel Chief of Police and Interim City Manager, Mark Daniel, Marion County Emergency Preparedness Coordinator Mike Hintz, and DLCD Planner Tricia Sears conducted a risk assessment meeting with the City of Mt; Angel that included a Hazard Vulnerability Assessment ranking. City staff met again with DLCD on July 7, 2022, to update this addendum.

The City of Mt. Angel staff attended HMP Steering Committee meetings on August 3, 2021, October 5, 2021, November 21, 2021, December 7, 2021, March 1, 2022, April 5, 2022, May 4, 2022, June 7, 2022, and July 5, 2022, and promoted the HMP survey and outreach efforts throughout the plan update. The city staff encouraged public input on the NHMP through presentations to the city council to inform the public about the NHMP update process in the City of Mt. Angel.

11.3 Risk Assessment

A risk assessment is intended to provide the “factual basis for activities proposed in the strategy to reduce losses from identified hazards (Department of Homeland Security, Federal Emergency Management Agency, 2023). This section of the HMP addendum can serve as the factual basis for addressing Oregon Statewide Planning Goal 7 – Areas Subject to Natural Hazards.

11.4 Community Profile

This section provides information on city specific assets and populations. For additional information on the characteristics of the City of Mt. Angel, in terms of geography, environment, population, demographics, employment and economics, as well as housing and transportation see Volume III, Appendix B, Community Profile. Many of these community characteristics can affect how hazards impact communities and how communities choose to plan for hazard mitigation. Considering the city specific assets during the planning process can assist in identifying appropriate measures for hazard mitigation.

11.4.1 Community Characteristics

Mt. Angel is a small community of about 3,392 people in 2020, approximately eighteen miles northeast of Salem. Indians had worshipped on the butte, called Tapalamaho, for generations, traveling from Klamath country to the southeast and from east of the Cascades. The first white settlers in the area included William and Jane (Graves) Glover, in 1847, and Benjamin and Rachel (Tompkins) Cleaver in 1850.

The considerable German influence in Mt. Angel is evident in its Bavarian-style storefronts and in its boast that it has the largest Glockenspiel in the United States. The town’s four-day Oktoberfest, held every year since 1966, is the largest folk festival in the Northwest. Mt. Angel’s economy is based on both agriculture and industry. Farmers grow berries, Christmas trees, seeds, and grain crops, and several businesses operate in the industrial zone next to the Southern Pacific line (Oregon Encyclopedia, 2022).

Figure 11-1, City of Mt. Angel



11.5 Critical and Important Facilities

Mt. Angel’s critical and important facilities include the following:

11.5.1 Transportation

Road	Owner	Notes
OR-214	ODOT	Runs North South through the city
Mt. Angel Hwy NE	County	Enters city from the southwest
Railroad	Willamette Valley	The rails are located next to the Mt. Angel Fire District’s main fire

11.5.2 Energy

- Electric service provided by Portland General Electric.
- Gasoline is available at Pacific Pride cardlock station and at 76 gas station.
- Generators: City Hall has a diesel-powered generator for emergency backup use.

11.5.3 Communications

Telephone communications consist of landlines, and cell service provided by Verizon, AT&T and T-Mobile. Internet service is provided by Direct Link.

11.5.4 Water / Wastewater

- **Drinking Water:** The city’s drinking water source is groundwater from two active wells through the distribution system. The distribution system is comprised of over twenty miles of pipe, nearly 1,000 valves, as well as two reservoirs that total over 1.3 million gallons of storage capacity. The City does not treat its water and provides a required annual water quality report.
- **Wastewater:** The Wastewater Treatment Facility is located west of Mt. Angel Gervais Road west of the urban growth boundary. The facility is equipped with emergency power fueled by natural gas.
 - The treatment plant consists of a headworks, three facultative lagoons and a polishing wetland. Wastewater is conveyed to the Wastewater Treatment Facility through a gravity collections system comprised of nearly 13.3 miles of pipe, ranging from 6 inches up to 24 inches, as well as approximately 260 manholes.
 - Wastewater is stored in the lagoons during the summer months and is treated and discharged to the Pudding River during the winter months, starting in November based on a discharge permit from the Oregon Department of Environmental Quality. Daily flows into the facility average approximately .5 million gallons a day, total wastewater storage capacity is approximately 86 million gallons, and typical discharge rates being between 1.1 and 4.2 million gallons per day.

11.5.5 Emergency Services

- The Emergency Operations Center would be located in the library/community center as a primary location with the Fire Station providing a back-up location.
- Medical services are available from the Legacy Clinic.
- The city can provide emergency shelter, cooling & warming as appropriate in the library/community center.

11.5.6 Cultural / Historical

Mt. Angel attracts visitors to the historic buildings in town and to events and festivals including the 4th of July the Bach Festival at the Abby in the Spring, Octoberfest in October and in December a Hazelnut Festival is held annually.

11.5.7 Functional and Access Needs (Vulnerable Populations)

- Schools/Day Care: The city holds several day care facilities, an elementary, middle, and high school.
- Non-English speakers are among the residents of Mt. Angel some of whom are farm workers.
- Seniors and Retired people reside in Mt. Angel in the 3 facilities in the city.

See hazard sections below for potential hazard-related vulnerabilities to these facilities.

11.6 Plans and Policies

Table 11-1, Plans and Policies of the City of Mt. Angel

Document Name with Hyperlink if the document is available online	Year
Emergency Operations Plan	2021
Comprehensive Plan	Acknowledged 1987; most recently amended 2013
Transportation System Plan	2003
Stormwater Master Plan	2011
Wastewater Facilities Plan	2014
Water System Master Plan & Water Management and Conservation Plan	2010
Parks Master Plan	2009, updated most recently 2011

Table 11-2, Mt. Angel Hazard Profile

Community Overview							
Community Name	Population	# Of Buildings	Critical Facilities ¹	Total Building Value (\$)			
Mt. Angel	3,520	1,219	7	539,815,000			
Hazus-MH Analysis Summary							
Hazard	Scenario	Potentially Displaced Residents	% Potentially Displaced Residents	Damaged Buildings	Damaged Critical Facilities	Lost Estimate (\$)	Loss Ratio
Flood ²	1% Annual Chance	0	0%	0	0	0	0%
Earthquake	Mt. Angel Mw 6.8 Deterministic	613	17%	553	1	197,469,572	37%
Exposure Analysis Summary							
Hazard	Scenario	Potentially Displaced Residents	% Potentially Displaced Residents	Exposed Buildings	Exposed Critical Facilities	Building Value (\$)	Exposure Ratio
Landslide	High and Very High Susceptibility	0	0%	0	0	0	0%
Channel Migration	Channel Migration Zone	0	0%	0	0	0	0%
Wildfire	High and Moderate Risk	0	0%	2	0	87,000	0%
Lahar	Medium Zone (1000 to 15000 – Year)	0	0%	0	0	0	0%
¹ Facilities with multiple buildings were consolidated into one building complex. ² No damage is estimated for exposed structures with “First floor height” above the level of flooding (base flood elevation).							
Critical Facilities							
Critical Facilities by Community	Flood 1% Annual Chance	Earthquake Moderate to Complete Damage	Landslide High and Very High Susceptibility	Channel Migration Zone	Wildfire High or Moderate Risk	Lahar Hazard	
	Exposed	>50% Prob.	Exposed	Exposed	Exposed	Exposed	
John F Kennedy SR High School		X					
Mount Angel Fire Department							
Mount Angel Police Department *							
Mount Angel Public Works							
Mt Angel Middle School							
Silverton - Mt Angel Family Medicine							
St Mary's Public School							

Source: (Williams & Madin, 2022); * The DOGAMI Risk Report for Mt. Angel may not have considered that this building was constructed in the early 1900's and there are cracks in the building. The back half of the building that held fire trucks was

remodeled but no seismic upgrades were made to the structure. There are two large HVAC units on the roof. The source of this information is Chief Mark Daniel, Interim City Manager and Police Chief.

11.7 Hazard Analysis

The methodology for assessing risk was the same for all jurisdictions and a detailed description of the BOLD planning methodology can be found in Volume I, a brief description is below. To complete the risk assessment, the jurisdiction representatives first updated the description, type, location, and extent of each hazard. Next, they updated the Hazard Vulnerability Analysis based on each hazard’s potential impact on the community using a calculated priority risk index (CPRI) methodology developed by BOLD Planning⁴. This assessment method ranks the following factors to determine risk from the range of hazards identified:

1. Probability (frequency) of event
2. Magnitude of event
3. Expected warning time before event
4. Expected duration of event

Score	Probability	Warning Time	Magnitude/Severity	Duration
4	Highly Likely	Less than 6 hours	Catastrophic	More than 1 week
3	Likely	6-12 hours	Critical	Less than 1 week
2	Possible	12-24 hours	Limited	Less than 1 day
1	Unlikely	24+ hours	Negligible	Less than 6 hours

The assessment identifies three levels of risk: High, Moderate and Low.

High - High probability of occurrence; at least 50 percent or more of population at risk from hazard; significant to catastrophic physical impacts to buildings and infrastructure; major loss or potential loss of functionality to all essential facilities (hospital, police, fire, EOC and shelters).

Moderate - Less than 50 percent of population at risk from hazard; moderate physical impacts to buildings and infrastructure; moderate potential for loss of functionality to essential facilities.

Low - Low probability of occurrence or low threat to population; minor physical impacts.

IMPACT	Range Values	
	Low CPRI	High CPRI
High	3.0	4.0
Moderate	2.0	2.9
Low	1.0	1.9

A summary of the risk assessment findings and rankings is presented below.

Table 11-3, Mt. Angel Hazard Vulnerability Assessment – Natural Hazards

Hazard Profile Summary City of Mt. Angel including Mt. Angel Fire District Using BOLD Planning Analysis Scoring						
Non-Natural Hazard	Probability	Warning Time	Magnitude	Duration	CPRI	2022 Local Planning Significance
Weight Factor	0.45	0.15	0.3	0.1		
Earthquake	3	4	4	4	3.6	High
Severe Weather/Storm	4	2	3	4	3.4	High
Wildfire	3	3.5	3	4	3.2	High
Extreme Weather - High Temperature	3	2	3	4	3.0	High
Drought	3	1	3	4	2.8	Moderate
Tornado*	2	4	3	4	2.8	Moderate
Volcanic Eruption	2	1	3	4	2.4	Moderate
Flood**	2	1	2.5	3	2.1	Moderate
Landslide	1	1.5	1	3	1.3	Low
Avalanche***	1	1	1	1	1.0	Low

Source: BOLD Planning Risk Assessment Method; Analysis by Marion County Emergency Management and Mt. Angel on October 13, 2021. *Split out of Severe Weather in 2021; **Includes dam failure; ***New in 2021.

Table 11-4, Mt. Angel Hazard Vulnerability Assessment – Other Hazards

Hazard Profile Summary for the City of Mt. Angel including Mt. Angel Fire District Using BOLD Planning Analysis Scoring						
Non-Natural Hazard	Probability	Warning Time	Magnitude	Duration	CPRI	2022 Local Planning Significance
Weight Factor	0.45	0.15	0.3	0.1		
Cyberterrorism	3	4	4	4	3.6	High
Hazardous Materials – Non-Transportation	3	4	4	4	3.6	High
Unauthorized Entry	3	4	4	4	3.6	High
Fire - Residential / Commercial (Arson)	4	4	2	4	3.4	High
Public Health	3	4	3	3	3.2	High
Hazardous Materials Release - Transportation	2	4	4	4	3.1	High
Terrorism/Active Shooter/Workplace Violence	2	4	4	4	3.1	High
Agricultural Terrorism	2	1	3	4	2.4	Moderate
Chemical, Biological, Radiological, Nuclear, Explosive	2	2	2	2	2.0	Moderate

Source: Source: BOLD Planning Risk Assessment Method; Analysis by Marion County Emergency Management and Mt. Angel on October 13, 2021.

11.8 Hazard Characteristics

11.8.1 Avalanche

CPRI = 1.0, Risk Level: Low

Events: None during the past five years.

Vulnerability: Probability, Warning Time, Magnitude and Duration are anticipated to be low.

11.8.2 Drought

CPRI = 2.8, Risk Level: Moderate

Events: No specific drought related events over the past five years.

Vulnerability: Moderate. Although the duration of an event would exceed a week, the probability of an event is low due to the nature of the city’s water source.

11.8.3 Earthquake

CPRI = 3.6, Risk Level: High

Events: A magnitude 4.0 earthquake occurred 5 km east of Scotts Mills on December 14, 2017. A magnitude 3.1 earthquake occurred 6 km SSE of Silverton on April 15, 2018. A 2.0 earthquake occurred 2 km ESE of Scotts Mills on July 26, 2018, and a magnitude 2.6 earthquake occurred 6 km ESE of Scotts Mills on April 1, 2020. Other smaller quakes occurred in the vicinity of Mt. Angel during the period since 2017.

The 1993 Scott Mills quake caused \$28 million in damage to cities throughout Marion County.

Vulnerability: High. All four factors are ranked highly. The city’s water system reservoirs and distribution system would be susceptible to breakage in an earthquake event.

11.8.4 Extreme Heat

CPRI = 3.0, Risk Level: High

Events: June 26-28, 2021, and August 11-12, 2021, saw temperatures over 116 degrees in Mt. Angel. 2021 event Temps over 116; many self-reliant minded folks, not as much use of the cooling in the library as might have.

Vulnerability: High. The city’s residents were categorized by Chief Daniel as being self-reliant and not as many of them made use of the cooling center available in the library as might have done so.

11.8.5 Flood

CPRI = 2.1, Risk Level: Moderate

Events: None in the past five years.

Vulnerability: Moderate.

11.8.6 Landslide

CPRI = 1.3, Risk Level: Low

Events: None during the past five years.

Vulnerability: Low due to the geographical location of the city away from steep slopes.

11.8.7 Severe Weather

CPRI = 3.4, Risk Level: High

Events: January 7-8, 2017, and February 11-13, 2021, were the dates of winter storms/ice storms that affected the northern Oregon Cascade foothills.

Vulnerability: High rankings of the factors of probability and duration. The city is vulnerable to the loss of power due to downed wires and to the loss of telephone communications and internet due to the loss of power. The city was without power for a week following the 2021 ice storm.

11.8.8 Tornado

CPRI = 2.8, Risk Level: Moderate

Events: None in the past five years.

Vulnerability: Power and communications systems could be affected. Although the probability of an event is likely, the impact and warning time could be extreme.

11.8.9 Wildfire

CPRI = 3.2, Risk Level: High

Events: September 2020, the Beachie Creek fire burned 193,565 acres of land in Linn, Marion, and Clackamas counties. Although the Beachie Creek fire was within 7-10 miles of Mt. Angel, the city was not impacted by the fires directly. Wildfire smoke did affect the city’s residents in 2020.

Vulnerability: High. High and moderately high rankings of all factors. The experience of the 2020 wildfires heightened awareness among residents of the limited warning time and the potential magnitude and length of the duration of an event.

11.9 Mitigation Strategy

During the 2022 Marion County Hazard Mitigation Plan and Jurisdiction Addendum update process, Oregon Department of Land Conservation & Development and Jurisdiction developed a list of priority actions. These actions were prioritized and then reviewed internally by staff and city council during the spring of 2022.

11.9.1 Mitigation Actions

The table below (Table, 11.5) shows the City of Mt. Angel initial mitigation actions.

Table 11-5, City of Mt. Angel Mitigation Actions

#	Hazard	Mitigation Action/Description	Priority	Timeline	Cost	Coordinating Organization	Status
2022-MH-1	Multi-Hazard	Obtain and install a generator to serve city hall.	H	1-3 Years	TBD	City of Mt. Angel	New
2022-EQ-1	Earthquake	Construct a new City Hall/Police facility	H	1-3 Years	TBD	City of Mt. Angel	New
2022-EQ-2	Earthquake	Evaluate and plan to improve aging water distribution system based on the Water System Master Plan & Water Management and Conservation Plan, 2010	H	3-5 Years	\$10 million	City of Mt. Angel	New
2022-EQ-3	Earthquake	Evaluate and plan to improve aging wastewater collection and treatment facilities based on Wastewater Systems Facilities Plan, 2013.	H	3-5 Years	\$7 million	City of Mt. Angel	New

Source: City of Mt. Angel HMP Steering Committee representative, July 2022.

12 Mt. Angel Fire District Addendum

12.1 Purpose

This document serves as the Mt. Angel Fire District’s Addendum to the Marion County Multi-Jurisdictional Hazards Mitigation Plan (HMP). The purpose of this addendum is to guide the implementation of mitigation actions by Mt. Angel Fire District to improve the resilience of the community. Please note that mitigation planning is a long-term endeavor— one that requires broad internal involvement and community engagement to be successful. Finally, please refer to the information contained in Volume I (Basic Plan) and Volume III (Appendices) of this HMP, which provides additional information (particularly regarding participation and mitigation strategy) and forms the basis of this addendum.

12.2 Plan Process, Participation, and Adoption

In 2021 and early 2022, Marion County partnered with the Oregon Department of Land Conservation and Development (DLCDC) and the Oregon Department of Emergency Management (OEM), and Marion County cities, including Mt. Angel Fire District, to update their addendum to the Marion County Hazard Mitigation Plan, which expired August 16, 2022.

By developing this addendum to the Marion County HMP, locally adopting it, and having it approved by FEMA, the Mt. Angel Fire District will gain eligibility for FEMA Hazard Mitigation, Pre-Disaster Mitigation, and Flood Mitigation Assistance grant program funds. This project is funded through the Federal Emergency Management Agency’s (FEMA) FY19 Pre-Disaster Mitigation Competitive Grant Program (PDMC-PL-10-OR-2019-003).

The Mt. Angel Fire District joined the Marion County HMP update by executing an intergovernmental agreement with DLCDC on December 15, 2021. On January 13, 2022, Mt. Angel Fire District Jim Trierweiler, Fire Chief, Marion County Emergency Preparedness Coordinator Mike Hintz, and DLCDC Planner Katherine Daniel conducted a risk assessment meeting with the Mt. Angel Fire District that included a Hazard Vulnerability Assessment ranking. City staff met again with DLCDC on April 7, 2022, to update this addendum.

Mt. Angel Fire District staff was unable to attend regular HMP Steering Committee meetings due to scheduling conflict with standing fire district meetings. However, the Mt. Angel Fire District promoted the HMP survey and outreach efforts throughout the plan update, including public posts on the district’s Facebook page on April 8, 2022, and on the district’s webpage prior to the May 4, 2022, public engagement focused Marion County HMP Steering Committee meeting.

12.3 Risk Assessment

A risk assessment is intended to provide the “factual basis for activities proposed in the strategy to reduce losses from identified hazards.”¹ This section of the HMP addendum can serve as the factual basis for addressing Oregon Statewide Planning Goal 7 – Areas Subject to Natural Hazards.

12.4 Community Profile

This section provides information on city specific assets and populations. For additional information on the characteristics of Mt. Angel Fire District, in terms of geography, environment, population, demographics, employment and economics, as well as housing and transportation see Volume III, Appendix B, *Community Profile*. Many of these community characteristics can affect how hazards impact communities and how communities choose to plan for hazard mitigation. Considering the city specific assets during the planning process can assist in identifying appropriate measures for hazard mitigation.

12.4.1 Community Characteristics

The Mt. Angel Fire District is located in the heart of Marion County, Oregon, The Fire District is approximately 35 square miles with one fire station located in the City of Mt. Angel. The district is a force of approximately 36 volunteers, 5 part-time employees, and a Fire Chief.

The Mt. Angel Fire District, formerly known as "Mt. Angel Fire Department", was formed after the 23rd legislature incorporated Mt. Angel as a city in 1905 and Fred Schwab became the first Mayor. Mt. Angel had a fire department before the 1905 date (1890's) but 1905 was when the formal organization was put in place with a city government. Over the years the organization has changed many times, the Mt. Angel Rural Fire Protection District was formed in 1946 and contracted for fire protection from the City of Mt. Angel in 1947. In November of 2003, the decision was made to consolidate the City and Rural District into one.

12.5 Critical and Important Facilities

Mt. Angel Fire District’s critical and important facilities include the following:

12.5.1 Transportation

Road	Owner	Notes
OR-214	ODOT	OR-214 runs approximately north-south through Mt. Angel from Silverton to the south and running north to connect to OR-99E
Railroad	Willamette Valley Railway	The rails are located next to the Mt. Angel Fire District’s main fire station. The rail company occasionally parks rail cars full of compressed gas on the tracks. This has been a concern for Fire Chief.

12.5.2 Energy

- Portland General Electric provides electricity to the city and to the fire district.
- The Mt. Angel Fire District uses the local fueling stations and the commercial fuel provider Pacific Pride card lock fueling station to provide diesel fuel.
- During the last two winter storms that involved ice and snow, the fueling stations were impacted with the loss of power and the inability to pump the fuel.

12.5.3 Emergency Services

- Fire Station – The station is seismically retrofitted. It was built around 1994 with a metal roof, but the building is outfitted with a fire suppression sprinkler system. There are five double bays that hold 10 trucks, and there are four offices, a kitchen, and a general meeting room.

The station might be considered for refuge or shelter, but it is not currently equipped for that use. The size of the station is a bit tight for a shelter, but the district is considering construction of a new storage structure that might be equipped as a shelter.

12.5.4 Communications

The district uses a Verizon hotspot that was set up during the 2021 ice storm which caused interruption of cell service due to power outage. The drawback to this communication method is that it serves only Verizon customers.

12.5.5 Functional and Access Needs (Vulnerable Populations)

Schools/Day Care: The district contains several day care facilities, an elementary, middle, and high school.

Non-English speakers are among the residents of Mt. Angel Fire District, some of whom are farm workers, Seniors and Retired people reside in Mt. Angel in the three facilities in the city. Vulnerability exists in housing where additional dwelling units are not constructed to building code. This can be a concern for migrant workers, low-income families, and people with compromised health (e.g., drug use).

See hazard sections below for potential hazard-related vulnerabilities to these facilities.

12.6 Plans and Policies

The Mt. Angel Fire District is governed by a Board of Director. The district maintains a Strategic Plan, which, although it is not required, is an important method for the district to plan for future operations and resilience. It covers staffing, facilities, vehicles, and building maintenance considerations.

12.7 Hazard Profile

Table 12-1, Mt. Angel Critical Facilities

Community Overview							
Community Name	Population	# Of Buildings	Critical Facilities ¹	Total Building Value (\$)			
Mt. Angel	3,520	1,219	7	539,815,000			
Hazus-MH Analysis Summary							
Hazard	Scenario	Potentially Displaced Residents	% Potentially Displaced Residents	Damaged Buildings	Damaged Critical Facilities	Lost Estimate (\$)	Loss Ratio
Flood ²	1% Annual Chance	0	0%	0	0	0	0%
Earthquake	Mt. Angel Mw 6.8 Deterministic	613	17%	553	1	197,469,572	37%
Exposure Analysis Summary							
Hazard	Scenario	Potentially Displaced Residents	% Potentially Displaced Residents	Exposed Buildings	Exposed Critical Facilities	Building Value (\$)	Exposure Ratio
Landslide	High and Very High Susceptibility	0	0%	0	0	0	0%
Channel Migration	Channel Migration Zone	0	0%	0	0	0	0%
Wildfire	High and Moderate Risk	0	0%	2	0	87,000	0%
Lahar	Medium Zone (1000 to 15000 – Year)	0	0%	0	0	0	0%
¹ Facilities with multiple buildings were consolidated into one building complex. ² No damage is estimated for exposed structures with “First floor height” above the level of flooding (base flood elevation).							
Critical Facilities							
Critical Facilities by Community	Flood 1% Annual Chance	Earthquake Moderate to Complete Damage	Landslide High and Very High Susceptibility	Channel Migration Zone	Wildfire High or Moderate Risk	Lahar Hazard	
	Exposed	>50% Prob.	Exposed	Exposed	Exposed	Exposed	
John F Kennedy SR High School		X					
Mount Angel Fire Department							
Mount Angel Police Department *							
Mount Angel Public Works							
Mt Angel Middle School							
Silverton - Mt Angel Family Medicine							
St Mary's Public School							

Source: Multihazard Risk Report for Marion County, DOGAMI, Williams, 2022.

12.8 Hazard Analysis

The methodology for assessing risk was the same for all jurisdictions and a detailed description of the BOLD planning methodology can be found in Volume I, a brief description is below. To complete the risk assessment, the jurisdiction representatives first updated the description, type, location, and extent of each hazard. Next, they updated the Hazard Vulnerability Analysis based on each hazard’s potential impact on the community using a calculated priority risk index (CPRI) methodology developed by BOLD Planning3. This assessment method ranks the following factors to determine risk from the range of hazards identified:

1. Probability (frequency) of event
2. Magnitude of event
3. Expected warning time before event
4. Expected duration of event

Score	Probability	Warning Time	Magnitude/Severity	Duration
4	Highly Likely	Less than 6 hours	Catastrophic	More than 1 week
3	Likely	6-12 hours	Critical	Less than 1 week
2	Possible	12-24 hours	Limited	Less than 1 day
1	Unlikely	24+ hours	Negligible	Less than 6 hours

The assessment identifies three levels of risk: High, Moderate and Low.

High - High probability of occurrence; at least 50 percent or more of population at risk from hazard; significant to catastrophic physical impacts to buildings and infrastructure; major loss or potential loss of functionality to all essential facilities (hospital, police, fire, EOC and shelters).

Moderate - Less than 50 percent of population at risk from hazard; moderate physical impacts to buildings and infrastructure; moderate potential for loss of functionality to essential facilities.

Low - Low probability of occurrence or low threat to population; minor physical impacts.

A summary of the risk assessment findings and rankings is presented below.

Table 12-2, Mt. Angel Hazard Vulnerability Assessment – Natural Hazards

Hazard Profile Summary City of Mt. Angel including Mt. Angel Fire District Using BOLD Planning Analysis Scoring						
Non-Natural Hazard	Probability	Warning Time	Magnitude	Duration	CPRI	2022 Local Planning Significance
Weight Factor	0.45	0.15	0.3	0.1		
Earthquake	3	4	4	4	3.6	High
Severe Weather/Storm	4	2	3	4	3.4	High
Wildfire	3	3.5	3	4	3.2	High
Extreme Weather - High Temperature	3	2	3	4	3.0	High
Drought	3	1	3	4	2.8	Moderate
Tornado*	2	4	3	4	2.8	Moderate
Volcanic Eruption	2	1	3	4	2.4	Moderate
Flood**	2	1	2.5	3	2.1	Moderate
Landslide	1	1.5	1	3	1.3	Low
Avalanche***	1	1	1	1	1.0	Low

Source: BOLD Planning Risk Assessment Method; Analysis by Marion County Emergency Management and Mt. Angel Fire District on April 17, 2022. *Split out of Severe Weather in 2021; **Includes dam failure; ***New in 2021.

Table 12-3, Mt. Angel Hazard Vulnerability Assessment – Other Hazards

Hazard Profile Summary for the City of Mt. Angel including Mt. Angel Fire District Using BOLD Planning Analysis Scoring						
Non-Natural Hazard	Probability	Warning Time	Magnitude	Duration	CPRI	2022 Local Planning Significance
Weight Factor	0.45	0.15	0.3	0.1		
Cyberterrorism	3	4	4	4	3.6	High
Hazardous Materials – Non-Transportation	3	4	4	4	3.6	High
Unauthorized Entry	3	4	4	4	3.6	High
Fire - Residential / Commercial (Arson)	4	4	2	4	3.4	High
Public Health	3	4	3	3	3.2	High
Hazardous Materials Release - Transportation	2	4	4	4	3.1	High
Terrorism/Active Shooter/Workplace Violence	2	4	4	4	3.1	High
Agricultural Terrorism	2	1	3	4	2.4	Moderate
Chemical, Biological, Radiological, Nuclear, Explosive	2	2	2	2	2.0	Moderate

Source: Source: BOLD Planning Risk Assessment Method; Analysis by Marion County Emergency Management and Mt. Angel Fire District on April 17, 2022.

12.9 Hazard Characteristics

12.9.1 Avalanche

CPRI = 1.0, Risk Level: Low

Events: None during the past five years.

Vulnerability: Probability, Warning Time, Magnitude and Duration are anticipated to be low.

12.9.2 Drought

CPRI = 2.8, Risk Level: Moderate

Events: No specific drought related events over the past five years.

Vulnerability: Moderate. Although the duration of an event would exceed a week, the probability of an event is low due to the nature of the city's water source.

12.9.3 Earthquake

CPRI = 3.6, Risk Level: High

Events: A magnitude 4.0 earthquake occurred 5 km east of Scotts Mills on December 14, 2017. A magnitude 3.1 earthquake occurred 6 km SSE of Silverton on April 15, 2018. A 2.0 earthquake occurred 2 km ESE of Scotts Mills on July 26, 2018, and a magnitude 2.6 earthquake occurred 6 km ESE of Scotts Mills on April 1, 2020. Other smaller quakes occurred in the vicinity of Mt. Angel during the period since 2017.

The 1993 Scott Mills quake caused \$28 million in damage to cities throughout Marion County.

Vulnerability: High. All four factors are ranked highly. The city's water system reservoirs and distribution system would be susceptible to breakage in an earthquake event.

12.9.4 Extreme Heat

CPRI = 3.0, Risk Level: High

Events: June 26-28, 2021, and August 11-12, 2021, saw temperatures over 116 degrees in Mt. Angel. 2021 event Temps over 116; many self-reliant minded folks, not as much use of the cooling in the library as might have.

Vulnerability: High. The city's residents were categorized by Chief Daniel as being self-reliant and not as many of them made use of the cooling center available in the library as might have done so.

12.9.5 Flood

CPRI = 2.1, Risk Level: Moderate

Events: None in the past five years.

Vulnerability: Moderate.

12.9.6 Landslide

CPRI = 1.3, Risk Level: Low

Events: None during the past five years.

Vulnerability: Low due to the geographical location of the city away from steep slopes.

12.9.7 Severe Weather

CPRI = 3.4, Risk Level: High

Events: January 7-8, 2017, and February 11-13, 2021, were the dates of winter storms/ice storms that affected the northern Oregon Cascade foothills.

Vulnerability: High rankings of the factors of probability and duration. The city is vulnerable to the loss of power due to downed wires and to the loss of telephone communications and internet due to the loss of power. The city was without power for a week following the 2021 ice storm.

12.9.8 Tornado

CPRI = 2.8, Risk Level: Moderate

Events: None in the past five years.

Vulnerability: Power and communications systems could be affected. Although the probability of an event is likely, the impact and warning time could be extreme.

12.9.9 Wildfire

CPRI = 3.2, Risk Level: High

Events: September 2020, the Beachie Creek fire burned 193,565 acres of land in Linn, Marion, and Clackamas counties. Although the Beachie Creek fire was within 7-10 miles of Mt. Angel, the city was not impacted by the fires directly. Wildfire smoke did affect the city's residents in 2020.

Vulnerability: High. High and moderately high rankings of all factors. The experience of the 2020 wildfires heightened awareness among residents of the limited warning time and the potential magnitude and length of the duration of an event.

12.10 Mitigation Strategy

During the 2022 Marion County Hazard Mitigation Plan and Mt. Angel Fire District Addendum update process, Oregon Department of Land Conservation & Development and Mt. Angel Fire District developed a list of priority actions. These actions were prioritized and then reviewed internally by staff and city council during the spring of 2022.

12.10.1 Mitigation Actions

The table below (Table, 12.5) shows the City of Mt. Angel initial mitigation actions.

Table 12-4, Mt. Angel Fire District Priority Action Items

#	Hazard	Mitigation Action/Description	Priority	Timeline	Cost	Coordinating Organization	Status
2022-MH-1	Multi-Hazard	Install a diesel generator on top of district fuel tank to power fire station and reservoir to fuel the apparatus.	H	1-3 Years	TBD	Mt. Angel Fire District	New
2022-MH-2	Multi-Hazard	Evaluate options for providing communication access to all citizens during power system outages.	H	1-3 Years	TBD	Mt. Angel Fire District	New
2022-WF-1	Wildfire	Install sprinkler system in Fire Station.	H	1-3 Years	TBD	Mt. Angel Fire District	New
2022-MH-3	Multi-Hazard	Consider the needs for shelter and refuge for natural hazard events and the equipment needed for those uses.	H	1-3 Years	TBD	Mt. Angel Fire District	New
2022-MH-4	Multi-Hazard	Purchase and install a reader board to provide timely information to the public.	H	1-3 Years	TBD	Mt. Angel Fire District	New

Source: Mt. Angel Fire District, April 7, 2022

13 City of Scotts Mills Addendum

13.1 Purpose

The purpose of the City of Scotts Mills Addendum to the Marion County Multi-Jurisdictional Hazards Mitigation Plan (HMP) is to guide the implementation of mitigation actions by the City of Scotts Mills to improve the resilience of the community. Please note that mitigation planning is a long-term endeavor—one that requires broad internal involvement and community engagement to be successful. Finally, please refer to the information contained in Volume I (Basic Plan) and Volume III (Appendices) of this HMP, which provides additional information (particularly regarding participation and mitigation strategy) and forms the basis of this addendum.

13.2 Plan Process, Participation, and Adoption

In 2021 and early 2022, Marion County partnered with the Oregon Department of Land Conservation and Development (DLCD) and the Oregon Department of Emergency Management (OEM), and Marion County cities, including City of Scotts Mills, to update their addendum to the Marion County Hazard Mitigation Plan, which expired August 16, 2022.

By developing this addendum to the Marion County HMP, locally adopting it, and having it approved by FEMA, the City of Scotts Mills will gain eligibility for FEMA Hazard Mitigation Assistance (HMA) funding that includes three programs: Building Resilient Infrastructure & Communities (BRIC), formerly the Pre-Disaster Mitigation grant program, Hazard Mitigation Grant Program (HMGP), and the Flood Mitigation Assistance (FMA) program. This project is funded through the Federal Emergency Management Agency’s (FEMA) FY19 Pre-Disaster Mitigation Competitive Grant Program (PDMC-PL-10-OR-2019-003).

The City of Scotts Mills joined the Marion County HMP update by executing an intergovernmental agreement with DLCD on October 15, 2021. On January 6, 2022, City of Scotts Mills Clerk, Robin Fournier, Marion County Emergency Preparedness Coordinator Mike Hintz, and DLCD Planner Katherine Daniel conducted a risk assessment meeting with the City of Scotts Mills that included a Hazard Vulnerability Assessment ranking. City staff met again with DLCD on April 4, 2022, to update this addendum.

City of Scotts Mills staff attended HMP Steering Committee meetings on April 5, 2022, and May 4, 2022. The city promoted the HMP survey and outreach efforts throughout the plan update, including public posts on the city’s website and Facebook page to inform the public about the development of the Hazard Mitigation Plan update.

13.3 Risk Assessment

A risk assessment is intended to provide the “factual basis for activities proposed in the strategy to reduce losses from identified hazards” (Department of Homeland Security, Federal Emergency Management Agency, 2023). This section of the HMP addendum can serve as the factual basis for addressing Oregon Statewide Planning Goal 7 – Areas Subject to Natural Hazards.

13.4 Community Profile

This section provides information on city specific assets and populations. For additional information on the characteristics of City of Scotts Mills, in terms of geography, environment, population, demographics, employment and economics, as well as housing and transportation see Volume III, Appendix C, Community Profile. Many of these community characteristics can affect how hazards impact communities and how communities choose to plan for hazard mitigation. Considering the city specific assets during the planning process can assist in identifying appropriate measures for hazard mitigation.

13.4.1 Community Characteristics

The City of Scotts Mills is located in the Willamette Valley in Marion County, Oregon, approximately 2 miles south of Marquam and Oregon Route 213, between Silverton and Molalla. The city takes its name from the sawmill and flour mill owned by Robert Hall Scott and Thomas Scott at this location, which became known as Scotts Mills in about 1866. The city has a total area of 0.36 square miles and is home to 399 people. Butte Creek flows just to the east of Scotts Mills as it makes its way north to join the Pudding River.

13.5 Critical and Important Facilities

City of Scotts Mills’ critical and important facilities include the following:

13.5.1 Transportation

Road	Owner	Notes
OR-213E	ODOT	3.5 miles west of the city
Mt. Angel/Scotts Mills Rd.	Marion County	Runs east-west through the city
Crooked Finger Rd.	Marion County	Runs north-south on the eastern side of the city
3 rd Ave Bridge over Butte Creek at Mt. Angel Rd.	Marion County	Project started to replace the bridge with a tentative completion date in 2024.

13.5.2 Energy

Portland General Electric is the electricity provider to the city. A backup generator located at the city’s water pumps and reservoir. Fuel is brought in by truck to the water system generator. Otherwise, the city residents must travel to get fuel from fuel locations in Silverton, as there are no fuel stations in the city. The city is interested in getting a backup generator for city hall (Mitigation action item).

13.5.3 Water / Wastewater

Water System: The city's water source is a well that supplies more water than the city uses, and the well is equipped with a backup generator. The water system also includes two reservoirs, the lower reservoir, and the upper reservoir. The upper reservoir is also equipped with a backup generator.

Wastewater: The city residents utilize on-site septic systems.

13.5.4 Dams

The cement and boulder dam located on Butte Creek at the Scotts Mills falls is decaying and slowly crumbling. Debris has fallen into the pool below and has become a hazard.

The Pudding River Watershed Council, with assistance from the Oregon Department of Fish and Wildlife, is proposing to demolish the dam to eliminate the safety hazard and to increase fish habitat and improve survival of threatened native salmon. Butte Creek is the native habitat for Endangered Species Act-listed Spring Chinook, and Winter Steelhead as well as Coho and Cutthroat Trout.

13.5.5 Communication

Zippy & Wave provide internet and phone services; and the city is served by all major cell service providers (AT &T, T-Mobile, Verizon), Satellite TV service.

Zippy has a substation located in Scotts Mills at 251 3rd St. near the location of the new bridge.

13.5.6 Emergency Services

Fire: Served by the Silverton Fire District which maintains a station in the city. Police: Served by the Marion County Sheriff's office

Public Works: The city does not have separate Public Works Department and city employees manage public infrastructure.

Medical: No facilities

Emergency Operations Center: City Hall serves as the EOC when needed. City Hall: Located at 265 4th Street.

The city does not have a community emergency response team or a shelter.

Emergency notification system is through the City Clerk and the multiple social media and website-based methods for notification employed by the city. The City of Scotts Mills is not taking up the Everbridge system.

13.5.7 Cultural/Historical Resources

The Historical Society is located at 210 Grandview and the historic Scott's house is located at 530 Crooked Finger Rd.

13.5.8 Functional and Access Needs (Vulnerable Populations)

- Schools/Day Cares: The city is located within the Silver Falls School District and contains the Scotts Mills Elementary School
- Non-English-speaking people comprise 5% of the population.
- A Food Bank located at 295 4th St.

See hazard sections below for potential hazard-related vulnerabilities to these facilities.

13.6 Plans and Policies

Table 13-1, Plans and Policies of the City of Scotts Mills

Document Name with Hyperlink if the document is available online	Year
Comprehensive Plan	2013
Water Master Plan	2002

13.7 Hazard Profile

Table 13-2, City of Scotts Mills Hazard Profile

Community Overview							
Community Name	Population	# Of Buildings	Critical Facilities ¹	Total Building Value (\$)			
Scotts Mills	385	242	2	63,043,000			
Hazus-MH Analysis Summary							
Hazard	Scenario	Potentially Displaced Residents	% Potentially Displaced Residents	Damaged Buildings	Damaged Critical Facilities	Lost Estimate (\$)	Loss Ratio
Flood ²	1% Annual Chance	0	0.0%	0	0	0	0.0%
Earthquake	Mt. Angel Mw 6.8 Deterministic	96	24.9%	118	0	16,983,461	26.9%
Exposure Analysis Summary							
Hazard	Scenario	Potentially Displaced Residents	% Potentially Displaced Residents	Exposed Buildings	Exposed Critical Facilities	Building Value (\$)	Exposure Ratio
Landslide	High and Very High Susceptibility	234	61%	140	0	31,315,000	50%
Channel Migration	Channel Migration Zone	0	0%	0	0	0	0%
Wildfire	High and Moderate Risk	15	3.9%	7	0	1,280,323	2.0%
Lahar	Medium Zone (1000 to 15000 – Year)	0	0%	0	0	0	0%
¹ Facilities with multiple buildings were consolidated into one building complex. ² No damage is estimated for exposed structures with “First floor height” above the level of flooding (base flood elevation).							
Critical Facilities							
Critical Facilities by Community	Flood 1% Annual Chance	Earthquake Moderate to Complete Damage	Landslide High and Very High Susceptibility	Channel Migration Zone	Wildfire High or Moderate Risk	Lahar Hazard	
None Reported							

Source: Multi-hazard Risk Report, DOGAMI, Williams, 2022.

13.8 Hazard Analysis

The methodology for assessing risk was the same for all jurisdictions and a detailed description of the BOLD planning methodology can be found in Volume I, a brief description is below. To complete the risk assessment, the jurisdiction representatives first updated the description, type, location, and extent of each hazard. Next, they updated the Hazard Vulnerability Analysis based on each hazard’s potential impact on the community using a calculated priority risk index (CPRI) methodology developed by BOLD Planning2. This assessment method ranks the following factors to determine risk from the range of hazards identified:

1. Probability (frequency) of event
2. Magnitude of event
3. Expected warning time before event
4. Expected duration of event

The assessment identifies three levels of risk: High, Moderate and Low.

High - High probability of occurrence; at least 50 percent or more of population at risk from hazard; significant to catastrophic physical impacts to buildings and infrastructure; major loss or potential loss of functionality to all essential facilities (hospital, police, fire, EOC and shelters).

Moderate - Less than 50 percent of population at risk from hazard; moderate physical impacts to buildings and infrastructure; moderate potential for loss of functionality to essential facilities.

Low - Low probability of occurrence or low threat to population; minor physical impacts.

IMPACT	Range Values	
	Low CPRI	High CPRI
High	3.0	4.0
Moderate	2.0	2.9
Low	1.0	1.9

A summary of the risk assessment findings and rankings is presented below.

Table 13-3, City of Scotts Mills Hazard Vulnerability Assessment – Natural Hazards

Hazard Profile Summary City of Scotts Mills Using BOLD Planning Analysis Scoring						
Non-Natural Hazard	Probability	Warning Time	Magnitude	Duration	CPRI	2022 Local Planning Significance
Weight Factor	0.45	0.15	0.3	0.1		
Earthquake	4	4	4	4	4.0	High
Wildfire	4	3.5	4	4	3.9	High
Severe Weather/Storm	4	3	4	4	3.9	High
Landslide	3	4	4	4	3.6	High
Tornado*	2	4	4	4	3.1	High
Flood**	3	2	2	4	2.7	Moderate
Extreme Weather-High Temperature	3	1	2	3	2.4	Moderate
Drought	2	1	3	4	2.4	Moderate
Volcanic Eruption	2	2	2	4	2.2	Moderate
Avalanche***	1	1	1	4	1.3	Low

Source: BOLD Planning Risk Assessment Method; Analysis by Marion County Emergency Management and City of Scotts Mills on January 6, 2022. *Split out of Severe Weather 2021; **Includes dam failure; ***New to 2022)

Table 13-4, Hazard Vulnerability Assessment – Other Hazards

Hazard Profile Summary for the City of Scotts Mills Using BOLD Planning Analysis Scoring						
Non-Natural Hazard	Probability	Warning Time	Magnitude	Duration	CPRI	2022 Local Planning Significance
Weight Factor	0.45	0.15	0.3	0.1		
Cyberterrorism	3	4	3.5	4	3.4	High
Public Health	3	2	3	4	3.0	High
Fire - Residential / Commercial (Arson)	2	4	3	4	2.8	Moderate
Unauthorized Entry	2	4	3	4	2.8	Moderate
Chemical, Biological, Radiological, Nuclear, Explosive	1	4	4	4	2.7	Moderate
Hazardous Materials Release - Transportation	1	4	3	4	2.4	Moderate
Terrorism/Active Shooter/Workplace Violence	1	4	3	4	2.4	Moderate
Agricultural Terrorism	1	4	2.5	4	2.2	Moderate
Hazardous Materials – Non-Transportation	1	1	1	1	1.0	Low

Source: Marion County Emergency Management and City of Scotts Mills, January 6, 2022

13.9 Hazard Characteristics

Hazard History, Characteristics and Extent for Marion County apply also to City of Scotts Mills. Volume I, Section 2, Risk Assessment, adequately describes the characteristics of hazards, as well as the location and extent of potential events. This section identifies vulnerabilities specific to City of Scotts Mills, recent localized hazard events and impacts, and illustrates the basis for the city’s HVA scores.

13.9.1 Avalanche

CPRI = 1.3, Risk Level: Low

Events: None during the past five years.

Vulnerability: Probability, Warning Time, Magnitude and Duration are anticipated to be low.

13.9.2 Drought

CPRI = 2.4, Risk Level: Moderate

Events: No specific drought related events over the past five years.

Vulnerability: Low; water supply is in a very productive well and two reservoirs. Although the duration of an event would exceed a week, the probability of an event is low due to the nature of the city’s water source.

13.9.3 Earthquake

CPRI = 4.0, Risk Level: High

Events: A magnitude 2.0 earthquake occurred 2 km ESE of Scotts Mills on July 26, 2018. The 1993 Scott Mills quake caused \$28 million in damages to cities throughout Marion County.

Vulnerability: High. All four factors are ranked highly. The city’s water system reservoirs and distribution system would be susceptible to breakage in an earthquake event. The city’s structures were generally constructed prior to building codes that address seismic resilience and the magnitude of the event could be catastrophic.

13.9.4 Extreme Heat

CPRI = 2.4, Risk Level: Moderate

Events: June 26-28, 2021, and August 11-12, 2021, saw temperatures of 100 degrees or more.

Vulnerability: Moderate; the city is equipping the City Hall to serve as a cooling center. The probability of an event is ranked as likely and the duration of an event is estimated to continue more than a day, but less than a week.

13.9.5 Flood

CPRI = 2.7, Risk Level: Moderate

Events: None in the past five years.

Vulnerability: Moderate. The city has limited exposure to flooding based on the FEMA flood maps. Butte Creek floodway may impact several structures adjacent to the river.

13.9.6 Landslide

CPRI = 3.6 Risk Level: High

Events: None during the past five years.

Vulnerability: High. The southern portion of the city is built on a landslide deposit. Probability of occurrence is ranked as likely, and all other factors are ranked very high.

13.9.7 Severe Weather

CPRI = 3.9 Risk Level: High

Events: January 7-8, 2017 and February 11-13, 2021 were the dates of winter storms that affected the northern Oregon Cascade foothills.

Vulnerability: High rankings of all factors. The city is vulnerable to the loss of power due to downed wires and to the loss of telephone communications and internet due to the loss of power. The city is prepared to continue water service by equipping its water system with generators and fuel for them.

13.9.8 Tornado

CPRI = 3.1, Risk Level: High

Events: None in the past five years.

Vulnerability: Power and communications systems could be affected. Although the probability of an event is likely, the impact and warning time could be extreme.

13.9.9 Wildfire

CPRI = 3.9, Risk Level: High

Events: September 2020, the Beachie Creek fire burned 193,565 acres of land in Linn, Marion, and Clackamas counties. Although the Beachie Creek Wildfire was within miles of Scotts Mills, the city was not impacted by the fires directly. Wildfire smoke did affect the city's residents.

Vulnerability: High rankings of all factors. The city is vulnerable due to a need for vegetation management. Dead and diseased trees in public rights of way need to be addressed as well as proper vegetation management to maintain defensible space on private property. The experience of the 2020 Beachie Creek fire heightened awareness among residents of the limited warning time and the potential magnitude and length of the duration of an event.

13.9.10 Volcanic Eruption

CPRI = 2.2, Risk Level: Moderate

Events: None in the past five years.

Vulnerability: The city, which is approximately 50 miles away from Mt. Hood, would have limited time before ash from an eruption would impact the community; the impacts could last more than one week.

13.10 Mitigation Strategy

During the 2022 Marion County Hazard Mitigation Plan and City of Scotts Mills Addendum update process, Oregon Department of Land Conservation & Development and City of Scotts Mills developed a list of mitigation actions. These actions were prioritized and then reviewed internally by staff and city council during the spring of 2022.

13.10.1 Mitigation Actions

The table below (Table 13.5) shows the City of Scotts Mills mitigation actions.

Table 13-5, City of Scotts Mills Priority Mitigation Action Items

#	Hazard	Mitigation Action/Description	Priority	Timeline	Cost	Coordinating Organization	Status
2022-WF-1	Wildfire	Development code revisions to address the vegetation management of public and residential property.	H	1-3 Years	General funds and grants	City of Scotts Mills	New
2022-MH-1	Multi-Hazard	Replacement of 3rd Street bridge over Butte Creek.	H	Unknown	TBD	City of Scotts Mills	New
2022-MH-2	Multi-Hazard	Water system updates – Replace the lower reservoir and connect lower portion of town to the upper reservoir.	H	3-5 Years	\$750,000	City of Scotts Mills	New
2022-MH-3	Multi-Hazard	Secure a generator for City Hall to allow it to be used as a place for respite from high temperatures or wildfire smoke.	H	1-3 Years	TBD	City of Scotts Mills	New

Source: City of Scotts Mills addendum update interview, April 4, 2022

14 City of Stayton Addendum

14.1 Purpose

This document serves as the City of Stayton’s Addendum to the Marion County Multi-Jurisdictional Hazards Mitigation Plan (HMP). The purpose of this addendum is to guide the implementation of mitigation actions by Jurisdiction to improve the resilience of the community. Please note that mitigation planning is a long-term endeavor—one that requires broad internal involvement and community engagement to be successful. Finally, please refer to the information contained in Volume I (Basic Plan) and Volume III (Appendices) of this HMP, which provides additional information (particularly regarding participation and mitigation strategy) and forms the basis of this addendum.

14.2 Plan Process, Participation, and Adoption

In 2021 and early 2022, Marion County partnered with the Oregon Department of Land Conservation and Development (DLCD) and the Oregon Department of Emergency Management (OEM), and Marion County cities, including the City of Stayton, to update their addendum to the Marion County Hazard Mitigation Plan, which expired August 16, 2022.

By developing this addendum to the Marion County HMP, locally adopting it, and having it approved by FEMA, the City of Stayton will retain eligibility for FEMA Hazard Mitigation Assistance (HMA) funding that includes three programs: Building Resilient Infrastructure & Communities (BRIC), formerly the Pre-Disaster Mitigation grant program, Hazard Mitigation Grant Program (HMGP), and the Flood Mitigation Assistance (FMA) program. This project is funded through the Federal Emergency Management Agency’s (FEMA) FY19 Pre-Disaster Mitigation Competitive Grant Program (PDMC-PL-10-OR-2019-003).

The City of Stayton joined the Marion County HMP update by executing an intergovernmental agreement with DLCD on February 2, 2022. On January 11, 2022, City of Stayton Police Chief Dave Frisendahl, and City Manager – Interim Alissa Angelo, Marion County Emergency Preparedness Coordinator Mike Hintz, and DLCD Planner Katherine Daniel conducted a risk assessment meeting with the city that included a Hazard Vulnerability Assessment ranking. City staff met again with DLCD on April 8, 2022, to update this addendum.

City of Stayton staff attended HMP Steering Committee meetings on August 3, 2021, March 1, 2022, April 5, 2022, and May 4, 2022. The city’s staff promoted the HMP survey and outreach efforts throughout the plan update, including public posts on the city’s website and Facebook and Next-Door pages beginning on February 15, 2022, to distribute the plan update public survey to interested parties in the City of Stayton.

14.3 Risk Assessment

A risk assessment is intended to provide the “factual basis for activities proposed in the strategy to reduce losses from identified hazards” (Department of Homeland Security, Federal Emergency Management Agency, 2023). This section of the HMP addendum can serve as the factual basis for addressing Oregon Statewide Planning Goal 7 – Areas Subject to Natural Hazards.

14.4 Community Profile

This section provides information on city-specific assets. For additional information on the characteristics of the City of Stayton, in terms of geography, environment, population, demographics, employment and economics, as well as housing and transportation see Volume III, Appendix B, Community Profile. Many of these community characteristics can affect how hazards impact communities and how communities choose to plan for hazard mitigation. Considering the city-specific assets during the planning process can assist in identifying appropriate measures for hazard mitigation.

14.4.1 Community Characteristics

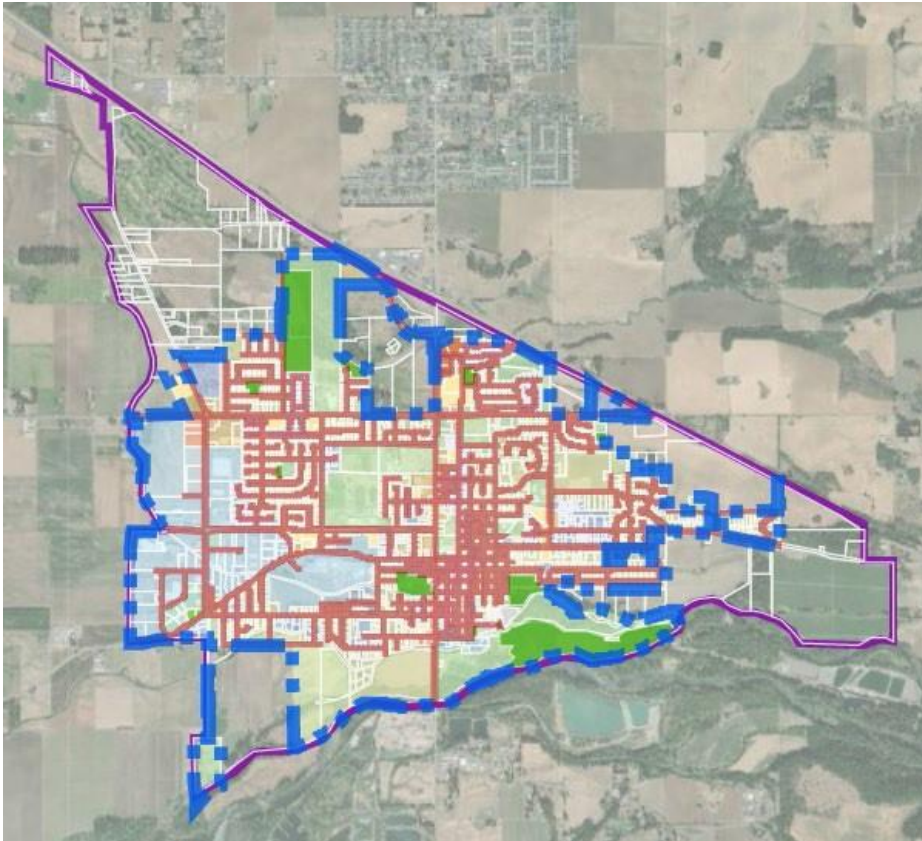
The City of Stayton is in Marion County, Oregon, at the confluence of the Santiam Canyon and Willamette Valley. Located roughly 15-miles east of Salem, the city is bordered to the north and east by Highway 22, the south and east by the Santiam River, and the west by agricultural lands. Stayton is in Oregon’s Willamette Valley, which experiences a moderate climate. In August, the average high temperature is 82 degrees, and the average low temperature is 51 degrees. Wintertime temperatures in January range from an average high of 46 degrees to an average low of 33 degrees. The average annual precipitation is 39.9 inches. Stayton is relatively flat, except at the terminus of Santiam canyon in the northeast portion of the city.

The US Census lists Stayton’s 2020 population at 8,244. This represents a 6.72% increase from 2015. For more demographic information, refer to Volume III, Appendix B, Community Profile

14.4.2 Economy

Stayton was founded as a mill city. Its location near a plentiful water source made it attractive for water-powered industry. Several mills, from timber to flour, operated in Stayton following its establishment. In the early part of the 20th century, Stayton transitioned to an emphasis on agricultural – the NORPAC Foods, Inc. processing plant is currently the city’s largest employer. Today, Stayton benefits from a relatively diverse local economy. The average household income in Stayton is \$41,432. For more economic information, refer to Volume III, Appendix B, Community Profile

Figure 14-1, City of Stayton Zoning Map



Source: [City of Stayton, Oregon \(staytonoregon.gov\)](http://staytonoregon.gov) Interactive Map on city website

14.5 Critical and Important Facilities

The City of Stayton's critical and important facilities include:

14.5.1 Transportation

Bridges

Table 14-1, Stayton Bridge Inventory

Stayton Bridge Inventory								
Water Body	Street	Owner	Inspection Date	Co-Located Utility				
				Sewer	Water	Electricity	Natural Gas	Telecomm
Salem Ditch	N. First Ave.	Stayton	8/10/2016	Yes	Yes	Yes	No	Yes
Salem Ditch	N. Second Ave.	Stayton	8/10/2016	No	No	No	No	No
Salem Ditch	N. Third Ave.	Stayton	8/10/2016	No	Yes	No	No	No
Salem Ditch	W. Washington St.	Stayton	8/10/2016	Yes	Yes	No	No	No
Stayton Ditch	N. Holly Ave.	Stayton	8/10/2016	No	Yes	No	No	No
Stayton Ditch	Jettters Way	Stayton	8/10/2016	Yes	Yes	No	No	No
Stayton Ditch	E. Water St.	Stayton	8/10/2016	No	No	No	No	No
Stayton Ditch	N. Fourth Ave.	Stayton	8/10/2016	No	No	No	No	No
Stayton Ditch	N First Ave	Marion	N/A	No	Yes	No	No	No
Salem Ditch	N Fourth Ave.	Stayton	N/A	No	No	No	No	No
Salem Ditch	N. Evergreen Ave.	Stayton	N/A	Yes	Yes	No	No	No
Salem Ditch	Wilco Rd.	Marion	N/A	Yes	Yes	No	No	No
Salem Ditch	UPRR	UPRR	N/A	No	No	No	No	No
Salem Ditch	Shaff Rd.	Marion	N/A	No	No	No	No	No
Mill Creek	Golf Club Rd.	Marion	N/A	No	No	No	No	No
Mill Creek	Cascade Highway	Marion	N/A	No	No	No	No	No

Source: City of Stayton

Note: Access to the water treatment plant requires crossing two bridges: 1 over the N Santiam R, 1 over the Stayton Canal. This could cause problems in the event of an earthquake that disables the bridges.

Note: Access to the wastewater treatment plant requires crossing two bridges: 1 bridge on Jeters Way and one bridge over Salem Ditch on Wilco Rd. This could cause problems in the event of an earthquake that disables the bridges.

Note: Pacific Power employees would have to cross three bridges to reach the Pacific Power plant.

Main Roads through Town:

- State Highway 22 (North Santiam Highway)
- Golf Club Rd/Wilco Rd.
- Stayton Rd./Washington Rd.
- 1st St/Cascade Hwy (leads to water treatment plant)
- Shaff Rd./Fern Ridge Rd.

Public Transit

- Cherriots Regional Transportation

14.5.2 Energy

Gasoline: Marc Nelson Oil Products (MNOP) local cardlock fueling center is the city’s primary fuel source. It provides fuel when needed. The amount of diesel fuel needed during the 2020 wildfires increased to 8,000 gallons.

The county fuel assessment for 2022 reflects the Stayton Public Works Director’s assessment of fuel needs for 190 gallons of unleaded fuel per week and 65 gallons of diesel fuel per week to run generators at the following locations for emergency service operation:

- Police
- Wastewater Treatment Plant
- Sanitary Sewer Collections
- Storm Sewer Collections
- Water Treatment Plant
- Water Collections

Police have a natural gas generator that won’t run on any other fuel The Fire District has a generator.

Electricity: Pacific Power

Natural Gas: NW Natural

14.5.3 Water / Wastewater

Water:

Drinking Water – There is a current project underway to identify a backup water source.

- Source: N Santiam River via the Stayton Power canal.
- One shallow well – just supplemental
- There are a very small number of residents on wells.
- Water treatment plant from 1st Ave. utilizes slow sand filtration system.
- Water storage:
 - Pine St. = 1 million gallons
 - Regis St. = .5 million gallons
 - Old, decommissioned storage tank on Holly

Note: Stayton has access to Salem’s system and can buy from Salem, if necessary, but there is no other water back-up source.

Note: There are pump stations throughout the city, the pump station lines would likely not survive an earthquake.

Wastewater:

- The wastewater treatment facility is located on Jettters Way which has a backup generator.
- Most of the sewer system is 50-year-old concrete pipe.
- Very, very few residents are on septic systems.
- NORPAC has its own wastewater treatment ponds on Jetter’s Way.

14.5.4 Communications

Communication Towers:

- Regis St. Reservoir – Police, Sprint
- Pine St. Reservoir has cell antennas – Fire, T-Mobile
- High school athletic field cell tower – Verizon (with a generator)
- Cell tower south of Shaff and west of Wilco
- Backup tower on the Police Department

The city relies on cell phones to communicate.

Auxiliary radio access for Police (portable).

Landline – SCTC (Stayton Cooperative Telephone Company). Problems occur when Stayton Cooperative shuts down one portion of their service area; it typically impacts the city’s system.

CERT has a radio system.

911 Communications, provided by METCOM, is old in the area. The city finds that they need the new county radio communication system to be implemented as soon as possible.

14.5.5 Emergency Services

Fire:

Stayton Rural Fire Protection District, 1988 W. Ida Street, Stayton, Oregon (503) 769-2601.

Police:

Police Department, 386 N. 3rd Ave. Stayton, Oregon (503) 769-3423.

Public Works:

City of Stayton, 311 N. 3rd Ave. Stayton, Oregon (503) 769-2919.

Municipal Services:

City Hall, 362 N. 3rd Ave. Stayton, Oregon (503) 769-3425.

Shelter: Community Center, 400 Virginia St. Stayton, Oregon (503) 769-2919.

Medical:

Santiam Memorial Hospital, 1401 N. 10th Ave. Stayton, Oregon (503) 769-2175.

14.5.6 Cultural / Historical Resources

Properties on the National Registry of Historic Places:

- Deitrich Building (3rd and Florence)
- Gehlens-Sims Building (2nd)
- The city has a preliminary listing of downtown buildings that would qualify for the national registry.

Properties:

- “The Brown House” Santiam Heritage Foundation (425 N. 1st Ave.)
- Library (515 N 1st Ave.)
- Community Center and City Swimming Pool (all next to library)

Events that may have large crowds:

- July: SummerFest and Car show– last Saturday of July, approx. 500 to 1,000 visitors
- July: 4th of July – 1,000-2,000 visitors
- July: Stampede – at Sublimity fair grounds (slight impact to traffic in town)
- September: Harvest Festival –at Sublimity fair grounds (slight impact to traffic in town)

14.5.7 Functional and Access Needs (Vulnerable Populations)

Schools – enrollment ~2,400:

Stayton High School (757 W. Locust St.)
Stayton Middle School (1021 Shaff Rd. SE)
Stayton Elementary School (875 N. 3rd Ave.)
Regis St. Mary’s School (550 W. Regis St. and 1066 N. 6th Ave.)

Daycares/preschools:

Rise and Shine Day Care (2350 Martin Dr.)
Tree House Day Care (287 E Washington St.)
Tiny Hands Day Care (451 Hobson St.)
Highland Pre-school (1450 Fern Ridge Rd.) – First United Methodist Church
All Star Pre-school (975 Fern Ridge Rd.) – Foothills Church

Assisted living:

Brookdale Senior Living Solutions (2201 3rd Ave.)

Other Facilities:

Santiam Senior Center (41818 Kingston Jordan Rd.)

Apartment complexes for seniors:

Elder Manor (900 W Ida)
Stayton Manor (3rd and Washington)
Oak Apartment (10th and Santiam)

Additional Information:

Some Spanish-speaking residents, but most also speak English.
Stayton has a small Somali population, but most also speak English.
Low-income: 47% of Stayton’s housing stock are rental properties.

Table 14-2, Government Subsidized Housing Developments from Stayton’s Comprehensive Plan

Name	Location	# of Units	Type
Hollister Apartments	315 W Hollister St	20	family
Northridge Apartments	1633 N. 3rd Ave	24	family
Oak Park Village	1011-1087 N. 10th Ave	32	elderly
Stayton Elder Manor	660 N Ida St	32	elderly
Stayton Manor	820 N 3rd Ave	16	elderly
Westside Apartments	965 Gardner Ave	24	family
Wolf Ridge	1301-1371 E Santiam St	51	family

Source: Oregon Dept of Housing and Community Services

See hazard sections below for potential hazard-related vulnerabilities to these facilities.

14.6 Plans and Policies

Table 14-3, Plans and Policies of the City of Stayton

Document Name	Year
City of Stayton Comprehensive Plan, Comp Plan Map	2021
Facilities Master Plan	2007
Local Wetland and Riparian Inventory	1999
Emergency Operations Plan	
Transportation System Plan – Vol 1 , Vol 2	2004
Sublimity Interchange Area Management Plan	2006
Downtown Transportation and Revitalization Plan	2007, amended 2010
Park and Recreation Master Plan	2005
Water Master Plan	2006
Wastewater Master Plan	2006
Stormwater Master Plan	2009

Source: City of Stayton website, consulted June 2022 http://www.staytonoregon.gov/page/planning_master_plans.

Table 14-4, City of Stayton Hazard Profile and Critical Facilities

Community Overview							
Community Name	Population	# Of Buildings	Critical Facilities ¹	Total Building Value (\$)			
Stayton	7,880	3,043	12	1,546,547,000			
Hazus-MH Analysis Summary							
Hazard	Scenario	Potentially Displaced Residents	% Potentially Displaced Residents	Damaged Buildings	Damaged Critical Facilities	Lost Estimate (\$)	Loss Ratio
Flood ²	1% Annual Chance	1	0.0%	2	0	33,000	0.0%
Earthquake	Mt. Angel Mw 6.8 Deterministic	62	0.8%	150	0	64,343,000	4.2%
Exposure Analysis Summary							
Hazard	Scenario	Potentially Displaced Residents	% Potentially Displaced Residents	Exposed Buildings	Exposed Critical Facilities	Building Value (\$)	Exposure Ratio
Landslide	High and Very High Susceptibility	97	1.2%	32	0	13,290,000	0.9%
Channel Migration	Channel Migration Zone	866	11%	379	2	157,134,000	10%
Wildfire	High and Moderate Risk	50	0.6%	22	2	9,114,000	0.6%
Lahar	Medium Zone (1000 to 15000 – Year)	0	0%	0	0	0	0%
¹ Facilities with multiple buildings were consolidated into one building complex. ² No damage is estimated for exposed structures with “First floor height” above the level of flooding (base flood elevation).							
Critical Facilities							
Critical Facilities by Community	Flood 1% Annual Chance	Earthquake Moderate to Complete Damage	Landslide High and Very High Susceptibility	Channel Migration Zone	Wildfire High or Moderate Risk	Lahar Hazard	
Regis High School					X		
Santiam Memorial Hospital - Stayton							
St Mary's Catholic School							
Stayton Christian School							
Stayton City Shops							
Stayton Elementary School							
Stayton Emergency Services							
Stayton High School					X		
Stayton Middle School							
Stayton Police Department				X			
Stayton RFPD							
Stayton Water Treatment Plant				X			

14.7 Hazard Analysis

The methodology for assessing risk was the same for all jurisdictions and a detailed description of the BOLD planning methodology can be found in Volume I, a brief description is below. To complete the risk assessment, the HMP update team first updated the description, type, location and extent of each hazard. Next, the team updated the Hazard Vulnerability Analysis based on each hazard’s potential impact on the community using a calculated priority risk index (CPRI) methodology developed by BOLD Planning. This assessment method ranks the following factors to determine risk from the range of hazards identified:

1. Probability (frequency) of event.
2. Magnitude of event.
3. Expected warning time before event.
4. Expected duration of event.

Score	Probability	Warning Time	Magnitude/Severity	Duration
4	Highly Likely	Less than 6 hours	Catastrophic	More than 1 week
3	Likely	6-12 hours	Critical	Less than 1 week
2	Possible	12-24 hours	Limited	Less than 1 day
1	Unlikely	24+ hours	Negligible	Less than 6 hours

The assessment identifies three levels of risk: High, Moderate and Low.

High - High probability of occurrence; at least 50 percent or more of population at risk from hazard; significant to catastrophic physical impacts to buildings and infrastructure; major loss or potential loss of functionality to all essential facilities (hospital, police, fire, EOC and shelters).

Moderate - Less than 50 percent of population at risk from hazard; moderate physical impacts to buildings and infrastructure; moderate potential for loss of functionality to essential facilities.

Low - Low probability of occurrence or low threat to population; minor physical impacts.

IMPACT	Range Values	
	Low CPRI	High CPRI
High	3.0	4.0
Moderate	2.0	2.9
Low	1.0	1.9

A summary of the risk assessment findings and rankings is presented below.

Table 14-5, City of Stayton Hazard Vulnerability Assessment – Natural Hazards

Hazard Profile Summary City of Stayton Using BOLD Planning Analysis Scoring						
Non-Natural Hazard	Probability	Warning Time	Magnitude	Duration	CPRI	2022 Local Planning Significance
Weight Factor	0.45	0.15	0.3	0.1		
Wildfire	4	4	3	4	3.7	High
Earthquake	3	4	4	4	3.6	High
Tornado*	3	4	3	4	3.3	High
Extreme Weather - High Temperature	3	1	4	4	3.1	High
Drought	3	1	3	4	2.8	Moderate
Severe Weather/Storm	3	2	2	3.5	2.6	Moderate
Flood**	3	1	2	3	2.4	Moderate
Volcanic Eruption	2	2	2	4	2.2	Moderate
Landslide	2	1	2	3	2.0	Moderate
Avalanche***	NA	NA	NA	NA	NA	NA

Source: BOLD Planning Risk Assessment Method; Analysis by Marion County Emergency Management and City of Stayton on April 8, 2022. *Split out of Severe Weather in 2021; ** Includes Dam failures; ***New in 2022

Table 14-6, City of Stayton Hazard Vulnerability Assessment – Other Hazards

Hazard Profile Summary for the City of Stayton Using BOLD Planning Analysis Scoring						
Non-Natural Hazard	Probability	Warning Time	Magnitude	Duration	CPRI	2022 Local Planning Significance
Weight Factor	0.45	0.15	0.3	0.1		
Fire - Residential / Commercial (Arson)	3	4	2	4	3.0	High
Hazardous Materials – Non-Transportation	3	4	2	4	3.0	High
Public Health Emergency (pandemic, water toxin)	4	1	2	4	3.0	High
Hazardous Materials Release - Transportation	3	4	2	3.5	2.9	Moderate
Agricultural Terrorism	2	1	4	4	2.7	Moderate
Unauthorized Entry	2.5	4	2	3	2.6	Moderate
Terrorism/Active Shooter/Workplace Violence	2	4	2	4	2.5	Moderate
Cyberterrorism	2	4	2	2	2.3	Moderate
Civil Disturbance	2	2	2	3.5	2.2	Moderate
Chemical, Biological, Radiological, Nuclear, Explosive	1	1	3	4	1.9	Low

Source: BOLD Planning Risk Assessment Method; Analysis by Marion County Emergency Management and City of Stayton on April 8, 2022

14.8 Hazard Characteristics

Hazard History, Characteristics and Extent for Marion County apply also to the City of Stayton. Volume I, Section 2, Risk Assessment, adequately describes the characteristics of hazards, as well as the location and extent of potential events. This section identifies vulnerabilities specific to the City of Stayton, recent localized hazard events and impacts, and illustrates the basis for the city's HVA scores.

14.8.1 Avalanche

Events: None

Vulnerability: Not ranked because there is no risk of this hazard in the City of Stayton.

14.8.2 Drought

CPRI = 2.8, Risk Level: Moderate

Events: Governor Kate Brown declared a drought emergency for all of Marion County in September 2015. Stayton was close to local drought conditions during that event.

Vulnerability: The probability of drought in Stayton is likely, the same as for the county. Stayton relies on surface water from the North Santiam River via the Stayton Power canal. Raw water is directed into the City's slow sand filtration system. Once treated, finished potable water is delivered to residential, commercial, and industrial customers through 44 miles of water distribution pipes. Stayton also maintains a shallow well for supplemental water supply. Finally, Stayton maintains an intertie with the City of Salem and can purchase water from Salem if needed. The city has a water curtailment plan that they never had to use.

14.8.3 Earthquake

CPRI = 3.6, Risk Level: High

Events: None in the past five years.

Vulnerability: Stayton's assessment of probability for a earthquake event without differentiating between a Crustal Earthquake event and a Cascadia Subduction Zone earthquake was "Likely" and their vulnerability to a Crustal Earthquake event was assessed as "Catastrophic".

An active earthquake fault located northwest of the city exists within five miles of the Stayton City Limit. Other active faults exist within ten miles to the west. The 1993 Scott Mills quake caused \$28 million in damage to cities throughout Marion County.

The City of Stayton is working with Marion County to complete a seismic retrofit project on the North First Avenue (Stayton-Scio Road) bridge over the Santiam River. Stayton expects that this project will increase transportation redundancy, allowing travel north and south post-earthquake.

The Stayton steering committee identified earthquake damage to the downtown central business district as a primary concern. Most of the buildings are old and constructed of masonry. The City's police department is also at risk of collapsing during an earthquake. The City's priority actions reflect these concerns.

Additional local concerns include:

- Questions about the hospital's seismic condition. Historically, the city and hospital have had limited communication or coordination related the earthquake vulnerability.
- The police department is the highest priority critical facility for retrofit. Notably, it houses all the city's computers.
- Stayton Community Center is the primary EOC (400 Virginia); secondary location is at the old 911 dispatch center.
- Pacific Power building will probably be standing (Wilco Rd. south end, across from Circle K) – this is their back up center for what operates the whole northwest.

In 2007, the Department of Geology and Mineral Industries (DOGAMI) conducted a seismic needs assessment for public school buildings, acute inpatient care facilities, fire stations, police stations, sheriffs' offices, and other law enforcement agency buildings. Buildings were ranked for the "probability of collapse" due to the maximum possible earthquake for any given area. Within the City of Stayton, the following buildings received a "high" or "very high" probability of collapse:

- Stayton Elementary: high (> 10%)
- Stayton Middle School: very high (100%)
- Stayton High School: very high (100%)
- Stayton Police Department: very high (100%)
- Stayton Memorial Hospital: high (> 10%)
- Stayton Fire (west Ida): very high (100%)

Please review the Risk Assessment (Volume I, Section 2) for additional information on this hazard.

14.8.4 Extreme Weather - Heat

CPRI = 3.1, Risk Level: High

Events: Several Extreme Heat events have occurred in Stayton and other areas of the Willamette Valley and Cascade foothills during the past five years.

8/9 thru 8/12/2021-Excessive heat; Hot weather began to develop August 9, peaking August 11-12, but temperatures continued above normal into the weekend. Peak afternoon temperatures of 100 to 105 degrees drove people to seek relief in or near bodies of water. Cooling shelters were opened in several counties.

6/26/2021-Excessive Heat; temperatures across the area warmed into the 100s to mid-110s over a three-day period. Record breaking temperatures up to 117 degrees were

recorded in Salem, OR. A total of 18 heat related deaths were reported, including two middle aged men who drowned in the Willamette River on Saturday, June 26.

8/1/2017-Excessive Heat; the record-breaking heat led people to seek relief at local rivers.

Vulnerability: The city’s representatives ranked the magnitude of an Extreme Heat event as “Catastrophic” due to the limited use of air conditioning equipment by residents.

14.8.5 Flood (including dam failure)

CPRI = 2.4, Risk Level: Moderate

Events: None during the past five years.

Vulnerability: The city’s probability for riverine flood is likely and their vulnerability to flood is limited. The city representatives for the City of Stayton are, however, concerned about the risks associated with dam failure.

Portions of Stayton have areas of flood plains (special flood hazard areas). These include areas along the Santiam River in the south and Mill Creek in the north. Overall, Stayton has relatively limited development in the mapped 100-year flood plain. However, the City’s water and wastewater treatment plants are located adjacent to the Santiam River. Past flood events have threatened those critical facilities. The Santiam water treatment plant almost flooded during a 2006 flood event.

Stayton has two irrigation canals that go through town. Those canals have head gates that can be closed. However, those gates have been breached at least once during historical flood events (e.g., 1996). The city has successfully worked with the county to clear ditches along Shaff Road. This mitigation effort has reduced localized nuisance flooding through that corridor.

The Steering Committee specifically identified the following areas as subject to nuisance urban flooding:

- Silvan Springs subdivision has a small area of street that floods periodically, but the homes have not been impacted.
- Undersized storm pipes cause localized flooding issues throughout town.
 - Intersection of 6th and Pine is a prime example of this issue.

Figure 14-2, Special Flood Hazard Area



Source: [Oregon HazVu: Statewide Geohazards Viewer \(DOGAMI\)](#)

With respect to the risk of dam failure, the National Inventory of Dams is a resource that provides information on dams and inundation mapping for a range of scenarios. The image below (Figure 14-4) represents the inundation for a maximum height breach of the Detroit Dam, a sort of worst-case scenario. The city may consider the information contained in the NID for locating of new emergency response services.

The city has installed a siren on the water tower, however, whether the siren is functional is in question.

Figure 14-3, Inundation map from the National Inventory of Dams (Maximum Height Breach scenario for Detroit Dam)



Source: National Inventory of Dams, [National Inventory of Dams \(army.mil\)](http://NationalInventoryofDams.army.mil)

14.8.6 Landslide

CPRI = 2.0, Risk Level: Moderate

Events: None during the past five years.

Vulnerability: Stayton has a relatively flat topography, except for the area north of East Santiam Road at the terminus of Santiam Canyon. DOGAMI does not currently identify existing landslides on the statewide inventory in Stayton.

14.8.7 Severe Weather

CPRI = 2.6, Risk Level: Moderate

Events:

Windstorm: December 11, 2021, saw strong winds (gusts up to 60 mph) through the Willamette Valley. Several reports of downed trees and branches as well as power outages for thousands of customers.

Winter Storm: On January 7-8, 2017, a broad shortwave trough brought multiple rounds of precipitation, including a wintry mix of snow and ice for many locations across Northwest Oregon.

Ice Storm: February 11-15, 2021, Disaster Declared (DR-4599)

Vulnerability: The city’s representatives assessed probability for severe weather events including windstorm and winter storms as highly likely and that their vulnerability to these Severe Weather events as “Limited” with durations of about a day. Once or twice per year

the city will experience a windstorm event that will interrupt services, experience downed trees, or cause power outages. Because windstorms typically occur during winter months, they are sometimes accompanied by ice, freezing rain, flooding, and very rarely, snow.

Major winter storms can and have occurred in the Stayton area. While these events do not typically cause significant damage, they are frequent and have the potential to impact economic activity. The most recent winter storms (December 2016 – January 2017) included snow and ice. Transportation and power interruptions combined with government office and school closures.

14.8.8 Tornado

CPRI = 3.3, Risk Level: High

Events: None in the past five years

Vulnerability: The city’s representatives identified the probability of a tornado as “Likely” and the magnitude of the impact as “Catastrophic”. With little warning and potential effects lasting more than a week, this hazard rated highly with the City of Stayton representatives.

14.8.9 Wildfire

CPRI = 3.7, Risk Level: High

Events: The City of Stayton experienced an influx of people who were forced to evacuate their homes due to the Beachie Creek fire in the Santiam Canyon during September 2020. This natural disaster was federally declared DR-4562 for Wildfire and Straight-line Winds and the Beachie Creek Fire was also declared a fire Management Assistance disaster FM- 5356-OR)

Vulnerability: Stayton has limited exposure to wildfire. Likely origination would be on agricultural lands outside the city limit or in wooded areas of Pioneer Park. Due to its location and limited fuels within the city, Stayton faces minimal risk of experiencing wildfires. There is no history of wildfire events in Stayton.

The County updated the Community Wildfire Protection Plan (CWPP) in 2016 and portions of Stayton are listed as having wildland urban interface (WUI) with areas of concern, see figure (14-5, City of Stayton-Wildfire Areas of Concern). depicts the areas near Stayton that the CWPP identifies as areas of concern. These areas were affected during the 2020 wildfires and should continue to be targeted for fire suppression activities.

14.8.10 Volcano Eruption

CPRI = 2.2, Risk Level: Moderate

Events: None in the past five years.

Vulnerability: The city’s representatives determined that the city’s probability for volcanic event is “Possible”, and the magnitude of a volcanic event is “Limited”, however the effects would last more than a week.

Stayton’s location at the terminus of Santiam Canyon makes it susceptible to impacts from lahar flows originating at Mount Jefferson.

14.9 Mitigation Strategy

During the 2022 Marion County Hazard Mitigation Plan and City of Stayton Addendum update process, Oregon Department of Land Conservation & Development and the City of Stayton representatives reviewed the list of priority and Action Item Pool actions. Relevant updates and new actions were developed to address the city’s current priorities. These actions were reviewed internally by staff and by the city council during the plan development process.

14.9.1 Mitigation Actions

The table below (Table 14.7) shows the City of Stayton mitigation actions.

Table 14-7, City of Stayton Mitigation Actions (Note: The first 4 actions items are “Priority Actions”)

#	Hazard	Mitigation Action/Description	Priority	Timeline	Cost	Coordinating Organization	Status
2022-FL-1	Flood	Upsize stormwater pipes at 6th and Pine, at the north end of Silvan Springs, and other streets with chronic localized flooding issues.	H	1-2 Years	Unknown	City of Stayton Public Works	Ongoing
2022-MH-1	Multi-Hazard	Assess the wastewater and water treatment plants’ ability to function during different hazard scenarios and begin to mitigate issues. This could include assessing and gathering supplies that will allow the plants to operate under emergency conditions and upgrading the facilities, so they are more resilient.	H	1-2 Years	Unknown	City of Stayton Public Works	Ongoing
2022-EQ-1	Earthquake	Purchase two portable temporary bridges to facilitate redundant transportation access to the wastewater treatment plan (via Wilco Rd. and Jetters Way) and downtown (via N. First Ave.).	H	1-2 Years	TBD	City of Stayton Public Works	Ongoing
2022-EQ-2	Earthquake	Acquire portable water filtration system(s) to improve water redundancy. The city’s sand bed filtration method is likely to be impaired after an earthquake.	H	1-2 Years	TBD	City of Stayton Public Works	Ongoing
2022-MH-2	Multi-Hazard	Work with the county to create memoranda of understanding with fuel stations that allows emergency responders first access to fuel. The county EM Coordinator has initiated a fuel inventory to address the need for fuel throughout the county under a power outage scenario.	H	1-2 Years	Staff Time	City of Stayton Public Works, and Police Department	Ongoing

#	Hazard	Mitigation Action/Description	Priority	Timeline	Cost	Coordinating Organization	Status
2022-MH-3	Multi-Hazard	Work with fuel stations to understand their storage capacity and backup power capabilities. The city is working at the county's direction to provide an inventory of fuel resources in the county. The city can work with Pacific Pride to anticipate a need for access to fuel in an emergency.	H	1-2 Years	Staff Time	City of Stayton Public Works and Police Department	Ongoing
2022-MH-4	Multi-Hazard	Develop an agreement with the City's fuel distributor around providing fuel to backup generators during a disaster event.	H	1-2 Years	Staff Time	City of Stayton	Ongoing
2022-MH-5	Multi-Hazard	Implement 2006-2007 water, wastewater, and stormwater master plan facility improvement recommendations. Include hazard vulnerabilities and mitigation measures for reducing infrastructure vulnerability. Consider hazards in all future facilities master plan updates.	M	3-5 Years	TBD	City of Stayton Public Works	New
2022-MH-6	Multi-Hazard	Acquire multi-band radios for public works.	H	1-2 Years	TBD	City of Stayton Public Works	New
2022-MH-7	Multi-Hazard	Develop memoranda of understanding with a port- o-potty company to establish "relief stations" throughout town post-event.	H	1-2 Years	TBD	City of Stayton	New
2022-MH-8	Multi-Hazard	Update the City's Emergency Operations Plan. Invite more critical partners to participate in the plan update, including the hospital and private sector representatives. Update should cover: *Formalizing emergency shelter locations *What supplies to acquire for shelters *How to acquire supplies for shelters *Stronger relationship with the Red Cross - more official shelters and a Red Cross wagon	M	3-5 years	Staff Time	City of Stayton Police Department	New
2022-MH-9	Multi-Hazard	Update the City's Continuity of Operations Plan. Consider conducting the COOP update in parallel with the EOP update.	M	3-5 Years	Staff Time	City of Stayton Police Department	New

#	Hazard	Mitigation Action/Description	Priority	Timeline	Cost	Coordinating Organization	Status
2022-MH-10	Multi-Hazard	Provide mitigation and preparedness information and resources to residents via schools, faith organizations, utility billings, and special events such as SummerFest. Use social media (Facebook , Next Door and digital newsletter) to provide this information. Educate businesses about the importance of continuity of operations plans to make them more resilient to hazards	L	Annually	Staff Time	City of Stayton Police Department	On-going
2022-MH-11	Multi-Hazard	Create a hazard resilience section on the City's website that provides mitigation and preparedness resources.	H	1-2 Years	Staff Time	City of Stayton	Completed, Ongoing updates
2022-MH-12	Multi-Hazard	Outreach to residents to increase participation in the Everbridge communication system.	H	Annually	Staff Time	City of Stayton Police Department	On-going
2022-MH-13	Multi-Hazard	Partner with Marion Co. to provide city staff with emergency management and response training City is anticipating opportunities from the county and will participate provided time and personnel are available.	M	Annually	Staff Time	City of Stayton Police Department	On-going
2022-MH-14	Multi-Hazard	Install automated shutoff valve to limit impact of spills on highway to surface water resource.	H	1-3 Years	TBD	City of Stayton Public Works	New
2022-MH-15	Multi-Hazard	Replace the aging generator at the Police Department.	H	1-3 Years	TBD	City of Stayton Police Department	New
2022-MH-16	Multi-Hazard	Obtain and install a generator at the radio tower to power radio communications that support police, fire, and ambulance services.	H	1-3 Years	TBD	City of Stayton	New
2022-MH-17	Multi-Hazard	Establish a city owned fuel storage facility.	M	2-5 Years	TBD	City of Stayton	New
2022-MH-18	Multi-Hazard	Improve the ability of the city to access grant funding and training by providing additional capacity such as assistance in grant application through state agencies.	M	2-5 Years	Staff Time	City of Stayton	New

#	Hazard	Mitigation Action/Description	Priority	Timeline	Cost	Coordinating Organization	Status
2022-DR-1	Drought	Participate in the Marion Co. Drought Contingency Plan. Provided this is still an ongoing effort, the city staff would participate to the best of their ability.	H	12 months	Staff Time	City of Stayton	Starting in 2023
2022-EQ-3	Earthquake	Host outreach events aimed at teaching residents how to turn off their gas and water valves.	M	Annually	Staff Time	Stayton Fire District	Ongoing
2022-EQ-4	Earthquake	Encourage residents to prepare and maintain two- week (at minimum) survival kits. Part of city's messaging; staff have done posts in September about preparedness	M	Annually	Staff Time	City of Stayton	Ongoing
2022-EQ-5	Earthquake	Determine whether the City's water tanks (Pine St. and Regis St. locations) are seismic resilience.	M	3-5 Years	TBD	City of Stayton Public Works	New
2022-FL-2	Flood	Work with Marion Co. public works to clear and maintain ditches on county roads.	M	Annually	Staff Time	City of Stayton Public Works	Ongoing
2022-FL-3	Flood	Create a memorandum of understanding with Knife River so they will supply sandbags during a flood.	M	1-2 Years	Staff Time	City of Stayton	Ongoing
2022-SW-1	Severe Weather	Meet with utility companies to build relationships. Outcome should be an understanding of where infrastructure is located, who to contact in an emergency, and strategies for doing more outreach to the community.	M	1-2 Years	Staff Time	City of Stayton Public Works and Police Department	Ongoing
2022-SW-2	Severe Weather	Work with Pacific Power to encourage them to upgrade old infrastructure.	M	1-2 Years	Staff Times	City of Stayton	Ongoing

15 City of Sublimity Addendum

15.1 Purpose

This document serves as the City of Sublimity’s Addendum to the Marion County Multi-Jurisdictional Hazards Mitigation Plan (HMP). The purpose of this addendum is to guide the implementation of mitigation actions by the City of Sublimity to improve the resilience of the community. Please note that mitigation planning is a long-term endeavor—one that requires broad internal involvement and community engagement to be successful. Finally, please refer to the information contained in Volume I (Basic Plan) and Volume III (Appendices) of this HMP, which provides additional information (particularly regarding participation and mitigation strategy) and forms the basis of this addendum.

15.2 Plan Process, Participation, and Adoption

In 2021 and early 2022, Marion County partnered with the Oregon Department of Land Conservation and Development (DLCD) and the Oregon Department of Emergency Management (OEM), and Marion County cities, including Sublimity, to update their addendum to the Marion County Hazard Mitigation Plan, which expired August 16, 2022.

By developing this addendum to the Marion County HMP, locally adopting it, and having it approved by FEMA, the City of Sublimity will gain eligibility for FEMA Hazard Mitigation Assistance (HMA) funding that includes three programs: Building Resilient Infrastructure & Communities (BRIC), formerly Pre-Disaster Mitigation, the Hazard Mitigation Grant Program (HMGP), and the Flood Mitigation Assistance (FMA) program. This project is funded through the Federal Emergency Management Agency’s (FEMA) FY19 Pre-Disaster Mitigation Competitive Grant Program (PDMC-PL-10-OR-2019-003).

The City of Sublimity joined the Marion County HMP update by executing an intergovernmental agreement with DLCD on 11-15-21. On November 8, 2021, City of Sublimity staff including, Alan Frost, Public Works Director, and Jason Devine, Senior Maintenance Operator, Marion County Emergency Preparedness Coordinator Mike Hintz, and DLCD Planner Tricia Sears conducted a risk assessment meeting with the City of Sublimity that included a Hazard Vulnerability Assessment ranking. Director Frost and Mayor James Kingsbury met again with DLCD’s Pam Reber on March 29, 2022, to update this addendum.

15.3 Risk Assessment

A risk assessment is intended to provide the “factual basis for activities proposed in the strategy to reduce losses from identified hazards” (Department of Homeland Security, Federal Emergency Management Agency, 2023). This section of the HMP addendum can serve as the factual basis for addressing Oregon Statewide Planning Goal 7 – Areas Subject to Natural Hazards.

15.4 Community Profile

This section provides information on city specific assets and populations. For additional information on the characteristics of City of Sublimity, in terms of geography, environment, population, demographics, employment and economics, as well as housing and transportation see Volume III, Appendix B, Community Profile. Many of these community characteristics can affect how hazards impact communities and how communities choose to plan for hazard mitigation. Considering the city specific assets during the planning process can assist in identifying appropriate measures for hazard mitigation.

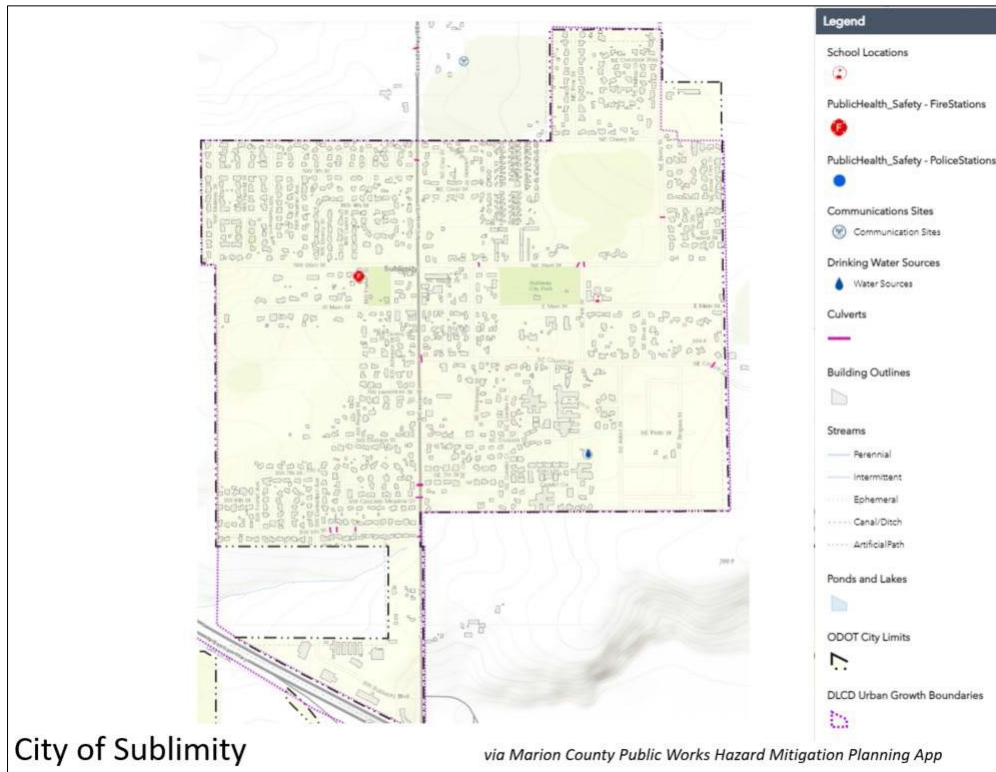
15.4.1 Community Characteristics

The City of Sublimity is a rural residential community about 15 miles east of Salem. It is situated on the western low foothills of the Oregon Cascades, on a plateau, amid gently rolling hills dropping down all around into grassy valleys. Sublimity is in Oregon’s Willamette Valley, which experiences a moderate climate. The Santiam River flows nearby, through the neighboring community of Stayton, to the south.

The Population Research Center at Portland State University lists the City of Sublimity’s 2020 population at 3,050. This represents a 60.9% increase from 2000 (Portland State University, Population Research Center, 2021). This small rural community was one of the earliest settlements in the Willamette Valley and had a population of 1,500 before the Civil War. A post office, school district, and a college were established in the 1850s.

Median household income in Sublimity during the period 2015-2019 was \$73,997, a 27.7% increase from the previous 5-year period (U.S. Census Bureau, 2022). Significant representations of the community in terms of demographics include Marian Estates, a retirement village, and St. Boniface, a Catholic Church.

Figure 15-1, City of Sublimity Map



15.5 Critical and Important Facilities

City of Sublimity's critical and important facilities include:

15.5.1 Transportation

- Two overpasses serve the City of Sublimity; they connect to Hwy 22 and to the City of Stayton. These have bridge structures that would be at risk in a Cascadia earthquake event.
- Hwy 22 cut off Golf Club Road one connection Burn Ridge Boone Hammer East Southeast part of town if bridge culverts mill creek and golf club road North Beaver creek 1.5 mi out of town then Hwy 22 if bridge out mill creek has a culvert then there is high water norther and south would be impacted.
- Bridge underground water, fiber, gas. Some might be connected to the bridge at Mill Creek (N/S).
- No rail
- Cascade Highway 213 runs through Sublimity bypass the 1-5 corridor Marion Co maintains the Hwy 213.

15.5.2 Energy

- Pacific Power-West
- Consumer Power- Old Mehama Road substation East of Sublimity Fern Ridge feed for the water tank gravity fed 8388 Bodenheimer Rd
- Fuel- City gasoline and diesel locations.

15.5.3 Water / Wastewater

- 4 well sites
- 376 SE Church St no backup power or portable generator.
- 245 NW Johnson St no backup power portable generator
- 538 SE Oak Grove Ave Sublimity Water Master Plan 2021 will have backup power installed in approximately two years, if not sooner.x`
- 8388 Bodenheimer Rd Water Reservoir 500k gallon reservoir to be removed; 750k gallon reservoir to be installed.
- New well in next year at Public Works Facility 542 NE Berry St.
- Water testing, well house building, installing distribution line to get it to the system. 2021 ARPA funds.
- Lift stations: 693 NE Berry street & 100 SW sublimity Blvd.
- 1970's concrete and asbestos cement pipe infrastructure systems. Could isolate system but 700-800 residents in the 70's new sub-division could be impacted.
- Two (2) of the wells are originals.

15.5.4 Emergency Services

Fire:

Sublimity Rural Fire Protection District, 115 NW Parker St. Sublimity, Oregon (503) 769-3282.

Police:

Marion County Sheriff's Office, 100 High Street NE Salem, Oregon (503) 588-5094.

Public Works:

City of Sublimity Public Works, 542 N. Berry St. Sublimity, Oregon (503) 769-2860.

CERT: Not Reported

Medical: Not Reported

Emergency Operations Center: Not Reported

City Hall:

City of Sublimity, 245 NW Johnson St. Sublimity, Oregon (503) 769-5475.

Shelter: Not Reported

15.5.5 Cultural / Historical Resources

- St. Boniface Catholic Church, 375 SE Church St. Sublimity, Oregon (503) 769-5664.

15.5.6 Functional and Access Needs (Vulnerable Populations)

- Schools: Not Reported

See hazard sections below for potential hazard-related vulnerabilities to these facilities.

15.6 Plans and Policies

Table 15-1, Plans and Policies of the City of Sublimity

Document Name	Year
Comprehensive Plan: Development Code Update	2020
Parks Analysis and Sublimity Parks Master Plan	2022
Transportation System Plan	2023
Sublimity Water Master Plan	2021
Sublimity Drinking Water Emergency Operations Plan	

15.7 Hazard Profile

Table 15-2, City of Sublimity Hazard Profile

Community Overview							
Community Name	Population	# Of Buildings		Critical Facilities ¹	Total Building Value (\$)		
Sublimity	3,050	1,157		4	546,449,000		
Hazus-MH Analysis Summary							
Hazard	Scenario	Potentially Displaced Residents	% Potentially Displaced Residents	Damaged Buildings	Damaged Critical Facilities	Lost Estimate (\$)	Loss Ratio
Flood ²	1% Annual Chance	0	0.0%	0	0	0	0.0%
Earthquake	Mt. Angel Mw 6.8 Deterministic	6	0.2%	19	0	7,850,753	1.4%
Exposure Analysis Summary							
Hazard	Scenario	Potentially Displaced Residents	% Potentially Displaced Residents	Exposed Buildings	Exposed Critical Facilities	Building Value (\$)	Exposure Ratio
Landslide	High and Very High Susceptibility	0	0.0%	0	0	0	0.0%
Channel Migration	Channel Migration Zone	0	0.0%	0	0	0	0.0%
Wildfire	High and Moderate Risk	0	0.0%	0	0	0	0.0%
Lahar	Medium Zone (1000 to 15000 – Year)	0	0.0%	0	0	0	0.0%
¹ Facilities with multiple buildings were consolidated into one building complex. ² No damage is estimated for exposed structures with “First floor height” above the level of flooding (base flood elevation).							
Critical Facilities							
Critical Facilities by Community	Flood 1% Annual Chance	Earthquake Moderate to Complete Damage	Landslide High and Very High Susceptibility	Channel Migration Zone	Wildfire High or Moderate Risk	Lahar Hazard	
Not Reported							

15.8 Hazard Analysis

The methodology for assessing risk was the same for all jurisdictions and a detailed description of the BOLD planning methodology can be found in Volume I, a brief description is below. To complete the risk assessment, the jurisdiction representatives first updated the description, type, location, and extent of each hazard. Next, they updated the Hazard Vulnerability Analysis based on each hazard’s potential impact on the community using a calculated priority risk index (CPRI) methodology developed by BOLD Planning5. This assessment method ranks the following factors to determine risk from the range of hazards identified:

1. Probability (frequency) of event
2. Magnitude of event
3. Expected warning time before event
4. Expected duration of event

The assessment identifies three levels of risk: High, Moderate and Low.

High - High probability of occurrence; at least 50 percent or more of population at risk from hazard; significant to catastrophic physical impacts to buildings and infrastructure; major loss or potential loss of functionality to all essential facilities (hospital, police, fire, EOC and shelters).

Moderate - Less than 50 percent of population at risk from hazard; moderate physical impacts to buildings and infrastructure; moderate potential for loss of functionality to essential facilities.

Low - Low probability of occurrence or low threat to population; minor physical impacts.

IMPACT	Range Values	
	Low CPRI	High CPRI
High	3.0	4.0
Moderate	2.0	2.9
Low	1.0	1.9

A summary of the risk assessment findings and rankings is presented below.

Table 15-3, City of Sublimity Hazard Vulnerability Assessment – Natural Hazards

Hazard Profile Summary City of Sublimity Using BOLD Planning Analysis Scoring						
Non-Natural Hazard	Probability	Warning Time	Magnitude	Duration	CPRI	2022 Local Planning Significance
Weight Factor	0.45	0.15	0.3	0.1		
Severe Weather/Storm	4	4	4	4	4.0	High
Wildland Interface Fire	4	4	3	4	3.7	High
Earthquake	3	4	3	4	3.3	High
Drought	3	1	3	4	2.8	Moderate
Extreme Weather - High Temperature	3	2	2	3	2.6	Moderate
Tornado*	1	4	3	4	2.4	Moderate
Volcanic Eruption	1	1	2	4	1.6	Low
Avalanche**	1	1	1	1	1.0	Low
Flood	1	1	1	1	1.0	Low
Landslide	1	1	1	1	1.0	Low

Source: BOLD Planning Risk Assessment Method; Analysis by Marion County Emergency Management and Sublimity on 11/8/21. *Split out from Severe Weather in 2022; **New in 2022; ***Including dam failures.

Table 15-4, City of Sublimity Hazard Vulnerability Assessment – Other Hazards

Hazard Profile Summary for the City of Sublimity Using BOLD Planning Analysis Scoring						
Non-Natural Hazard	Probability	Warning Time	Magnitude	Duration	CPRI	2022 Local Planning Significance
Weight Factor	0.45	0.15	0.3	0.1		
Cyberterrorism	4	4	3	4	3.7	High
Terrorism/Active Shooter/Workplace Violence	2	4	4	4	3.1	High
Hazardous Materials Release - Transportation	3	4	2.5	3	3.0	High
Chemical, Biological, Radiological, Nuclear, Explosive	2	4	2.5	4	2.7	Moderate
Fire - Residential / Commercial (Arson)	2	4	2.5	4	2.7	Moderate
Public Health	3	1	2.5	4	2.7	Moderate
Hazardous Materials - Non-Transportation	2	4	2.5	3	2.6	Moderate
Unauthorized Entry	2	4	2.5	2.5	2.5	Moderate
Agricultural Terrorism	2	1	2.5	4	2.2	Moderate

Source: BOLD Planning Risk Assessment Method; Analysis by Marion County Emergency Management and Sublimity on 11/8/21.

15.9 Hazard Characteristics

Hazard History, Characteristics and Extent for Marion County apply also to the City of Sublimity. Volume I, Section 2, Risk Assessment, adequately describes the characteristics of hazards, as well as the location and extent of potential events. This section identifies vulnerabilities specific to City of Sublimity, recent localized hazard events and impacts, and illustrates the basis for the city's HVA scores.

15.9.1 Avalanche

CPRI = 1.0, Risk Level: Low

Events: No events

Vulnerability: Not reported

15.9.2 Drought

CPRI = 2.8, Risk Level: Moderate

Events: Governor Kate Brown declared a drought emergency for all of Marion County in September 2015. Stayton was close to local drought conditions during that event.

Vulnerability: An extreme drought could result in a water shortage.

15.9.3 Earthquake

CPRI = 3.3, Risk Level: High

Events: None in the past five years.

Vulnerability: The City is updating their Transportation System Plan in part to identify other evacuation routes and evaluate the overpasses on Hwy 22 in case the overpasses fail.

15.9.4 Flood (Includes Dam Failure)

CPRI = 1.0, Risk Level: Low

Events: N/A

Vulnerability: Low flood risk within the city. Some risk near the southern city limits as seen in the FEMA flood map.

Figure 15-2, FEMA flood map for Sublimity



Source: FEMA Map Service Center, 7/25/2022. <https://msc.fema.gov/>

15.9.5 Landslide

CPRI = 1.0, Risk Level: Low

Events: N/A

Vulnerability: Sublimity is very flat, there is no landslide risk.

15.9.6 Severe Weather

CPRI = 4.0, Risk Level: High

Events: Ice storm in 2021 resulted in 4 days without power and communication (cell, internet, regular phone).

Vulnerability: Significant wind events occur in Sublimity each year, sometimes interrupting services, downing trees, and causing power outages. Because windstorms typically occur during winter months, they are sometimes accompanied by ice, freezing rain, flooding, and very rarely, snow.

15.9.7 Tornado

CPRI = 2.4, Risk Level: Moderate

Events: A tornado touched down in nearby Aumsville on December 14, 2010.

Vulnerability: In December 2010, a tornado touched down in Aumsville, causing around \$1.2 million dollars in damage.

15.9.8 Wildfire

CPRI = 3.7, Risk Level: High

Events: None Reported

Vulnerability: Sublimity is surrounded by agricultural lands which are highly managed and pose low risk for wildfire.

15.9.9 Volcanic Eruption

CPRI = 1.6, Risk Level: Low

Events: 1980 Mount St Helens eruption.

Vulnerability: Impacts from ash from an eruption of Mt. Hood could impact the community.

15.10 Mitigation Strategy

During the 2022 Marion County Hazard Mitigation Plan and the City of Sublimity Addendum update process, Oregon Department of Land Conservation & Development and the City of Sublimity developed a list of priority actions. These actions were prioritized and then reviewed internally by staff and city council during the spring of 2022.

15.10.1 Mitigation Actions

The table below (Table 1-5) shows the City of Sublimity mitigation actions.

Table 15-5, Sublimity Priority Action Items

#	Hazard	Mitigation Action/Description	Priority	Timeline	Cost	Coordinating Organization	Status
2022-MH-1	Multi-Hazard	Install a backup generator and fuel storage at Berry St Lift Station. Two sewer lift stations do not have on site backup power, they rely on portable generators. This poses the risk of an overflow during a power outage. Funding: FEMA, City sewer revenue, possibly SDC funding.	H	2-5 Years	\$50-100k	City of Sublimity	New
2022-MH-2	Multi-Hazard	Install backup power at Well 3 at 1.5-million-gallon storage reservoir. City engineer to evaluate the fuel type and project design to ensure it is appropriate for this site. Funding: FEMA, water revenue, possibly SDC funding.	H	2-5 Years	\$50-100k	City of Sublimity	New
2022-EQ-1	Earthquake	Improve the seismic resilience of the city's water storage by replacing 500k with a 750k water reservoir. The City has embarked upon a multi-year effort to improve water resilience to address growth and water reliability. The tank is elevated which will increase the pressure in the distribution system. Funding: ARPA, City SDC funding	H	1-3 Years	\$1.3 million	City of Sublimity	New
2022-MH-3	Multi-Hazard	Install a backup generator and fuel storage at Sublimity Blvd Lift Station. Can go longer due to ability to surcharge into system; serves a smaller area. Funding: FEMA, City sewer revenue.	M	2-5 Years	\$25-75k	City of Sublimity	New

#	Hazard	Mitigation Action/Description	Priority	Timeline	Cost	Coordinating Organization	Status
2022-MH-4	Multi-Hazard	Develop debris storage capability at Public Works facility for winter storm debris storage. 542 NE Berry Street site recently expanded. 10.5-acre site, 1.5 acres are for PW use. This site would be developed to conduct staging and storing of materials. Debris management equipment needed.	M	2-5 Years	\$50-100k	City of Sublimity	New
2022-MH-6	Multi-Hazard	Support Marion County Emergency Management in their work with Marion Estates to address backup power and other resilience activities. Marion Estates is the sole facility with a large population of potentially vulnerable community members; Marion Estates has several buildings that are unreinforced masonry. Assisted living facility with Alzheimer's unit.	M	2-5 Years	Staff Time	City of Sublimity	New

Source: City of Sublimity HMP Steering Committee, 3/29/22

16 City of Turner Addendum

16.1 Purpose

This document serves as the City of Turner’s Addendum to the Marion County Multi-Jurisdictional Hazards Mitigation Plan (HMP). The purpose of this addendum is to guide the implementation of mitigation actions by Turner to improve the resilience of the community. Please note that mitigation planning is a long-term endeavor—one that requires broad internal involvement and community engagement to be successful. Finally, please refer to the information contained in Volume I (Basic Plan) and Volume III (Appendices) of this HMP, which provides additional information (particularly regarding participation and mitigation strategy) and forms the basis of this addendum.

16.2 Plan Process, Participation, and Adoption

In 2021 and early 2022, Marion County partnered with the Oregon Department of Land Conservation and Development (DLCD) and the Oregon Department of Emergency Management (OEM), and Marion County cities, including the City of Turner, to update their addendum to the Marion County Hazard Mitigation Plan, which expired August 16, 2022.

By developing this addendum to the Marion County HMP, locally adopting it, and having it approved by FEMA, the Turner will gain eligibility for FEMA Hazard Mitigation Assistance (HMA) funding that includes three programs: Building Resilient Infrastructure & Communities (BRIC), formerly the Pre-Disaster Mitigation grant program, Hazard Mitigation Grant Program (HMGP), and the Flood Mitigation Assistance (FMA) program. This project is funded through the Federal Emergency Management Agency’s (FEMA) FY19 Pre-Disaster Mitigation Competitive Grant Program (PDMC-PL-10-OR-2019-003).

The City of Turner joined the Marion County HMP update by executing an intergovernmental agreement with DLCD on October 19, 2021. On October 5, 2021, Turner Fire District staff Rebecca Shivers Singleterry, Business Manager, and Jordan Donat, Fire Chief, joined Marion County Emergency Preparedness Coordinator Mike Hintz, and DLCD Planner Tricia Sears conducted a risk assessment meeting that included a Hazard Vulnerability Assessment ranking. The City of Turner provided a revision to their addendum on January 5, 2022. City staff met again with DLCD on June 15, 2022, to update this addendum.

The City of Turner Steering Committee is comprised of representatives from the following departments:

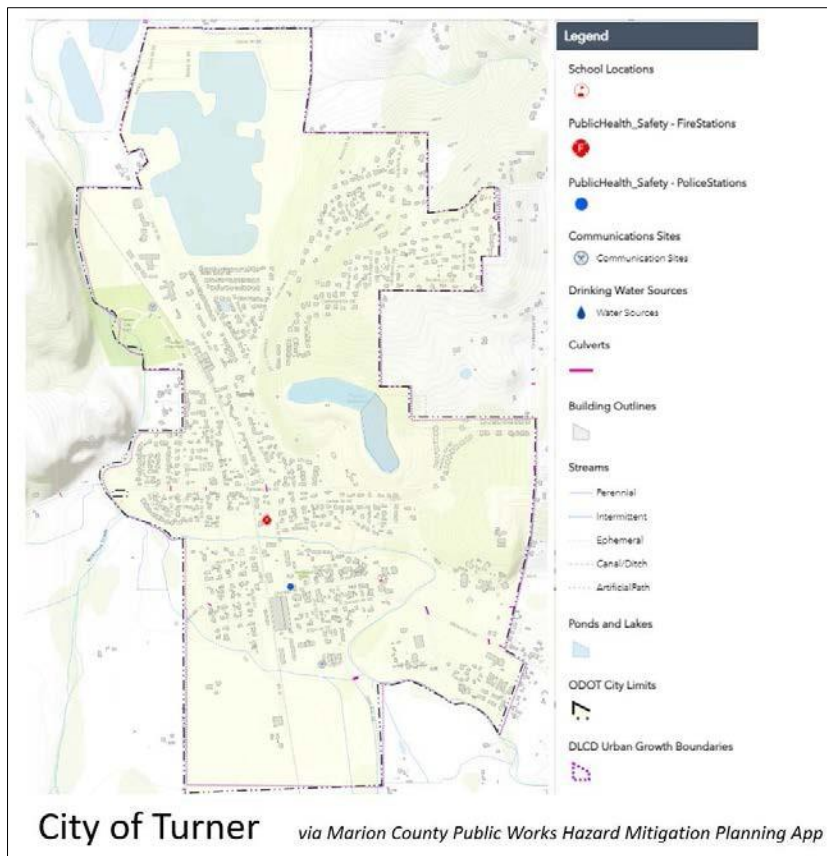
- Convener, City Administrator
- Mayor
- Turner Police Department
- Turner Fire District
- Community Emergency Response Team (CERT) Members
- Community Members
- Turner Public Works

Turner used multiple approaches to engage the public. First, the City established steering committee representatives from across the city. Next, the city actively participated in countywide community engagement activities described in Volume I, Section 4 and in Appendix B. City staff also presented the draft plan to the City Council during an open public council session. City of Turner staff attended HMP Steering Committee meetings in August, September, and November 2021. The City of Turner maintains a Hazard Mitigation webpage at https://www.cityofturner.org/hazard_mitigation.

16.3 Risk Assessment

A risk assessment is intended to provide the “factual basis for activities proposed in the strategy to reduce losses from identified hazards” (Department of Homeland Security, Federal Emergency Management Agency, 2023). This section of the HMP addendum can serve as the factual basis for addressing Oregon Statewide Planning Goal 7 – Areas Subject to Natural Hazards.

Figure 16-1, City of Turner Map



16.4 Community Profile

This section provides information on city specific assets and populations. For additional information on the characteristics of the City of Turner, in terms of geography, environment, population, demographics, employment and economics, as well as housing and transportation see Volume III, Appendix B, Community Profile. Many of these community characteristics can affect how hazards impact communities and how communities choose to plan for hazard mitigation. Considering the city specific assets during the planning process can assist in identifying appropriate measures for hazard mitigation.

16.4.1 Community Characteristics

The City of Turner is in Marion County, about six miles south of Salem, and approximately 54 miles inland from the Pacific Ocean. The topography within the city is characterized by a flat landscape, with the exceptions of two hills to the east and west of the city, which reach a maximum elevation of about 600 feet above sea level.

Turner is bisected by Mill Creek, which is the primary stream that runs through the city's limits. Mill Creek has an average annual flow rate of about 180 cubic feet per second and flows north through the city. The stream meanders through or adjacent to the city's limits for nearly three miles. Additional waterways within the city include the Mill Creek Bypass and the Perrin Lateral, both of which are significantly smaller than Mill Creek.

Like most of the Willamette Valley, Turner experiences a modified marine climate with cool and wet winters and moderately warm and dry summers. The average annual precipitation is approximately 39.28 inches with the heaviest rainfall in late fall and winter. While major snow falls are rare, Turner experiences an average annual snowfall of approximately 7.1 inches.

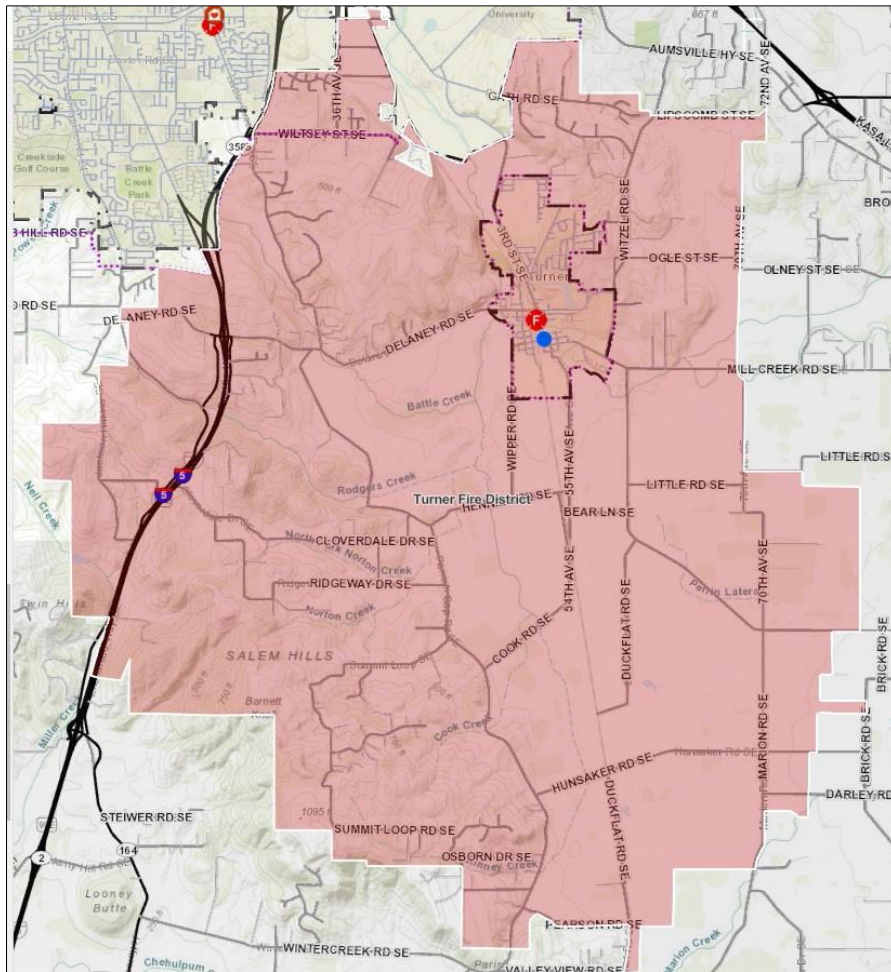
The Population Research Center at Portland State University lists Turner's 2020 population at 2,410. This represents a 107.8% increase from 2000 (Portland State University, Population Research Center, 2021). For more demographic information, refer to Appendix C.

16.4.2 Economy

Like most cities in Oregon, industry in Turner has fluctuated greatly since the founding of the city in the mid-1800s. In the late 1800s the primary industries were a flour mill and granaries (City of Turner, N.d.). However, these industries eventually gave way to the more dominant lumber industry that arose in the late 1900s. These early industries owe their success in large part to the construction of the railroad, which runs through the middle of the city.

Due to Turner's small population and the city's proximity to Salem, many of Turner's residents commute to work outside of the city. Median household income in Turner 2015-2019 was \$82,689, a 45.2% increase from the previous 5-year period (U.S. Census Bureau, 2022).

Figure 16-2, Turner Fire District Map



Source: Marion Co. GIS

16.4.3 Turner Fire District

The Turner Fire District is in the Mid-Willamette Valley just southeast of the capital city of Salem and shares borders with the following fire agencies: Aumsville Fire District, Jefferson Fire District, Stayton Fire District, Salem Suburban Fire District, Salem Fire Department and Marion County Fire District #1. Our community is made up of fifty-six square miles of rural residential, farm and agricultural properties and includes the City of Turner which is located within the boundaries of our fire district. We serve a population of over 6,500 people (Turner Fire District, 2018).

16.5 Critical and Important Facilities

Critical facilities include buildings, their internal components, and trained personnel, and may also include certain mobile units, such as those of first responders. For example, many vehicles of the police department, fire department (including ambulances), and public works department are key and essential components of the functions provided by these critical facilities. The interruption or destruction of any of these facilities would have a debilitating effect on incident management and long-term recovery. Not all critical facilities are of equal importance and are therefore subject to prioritization of criticality. The steering committee identified key critical facilities, listed in the “Hazard Profile”.

This plan also documents important infrastructure and facilities by lifelines, including transportation, energy, water, communication, emergency services, and cultural/historical resources. We also include a preliminary list of populations/locations that may be particularly vulnerable to hazards.

City of Turner Critical Facilities

Facility Name	Type
Turner Fire District	Emergency Services
Turner City Hall	Governance
Turner Police Department	Emergency Services
Turner Public Works	Emergency Services
Turner Retirement Homes	Care Facility
Cherriots Bus – Santiam Route 30X	Transportation
Turner Christian Church Food Bank	Food Services
Turner Elementary School	Miscellaneous
Cascade School District Office	Miscellaneous
Post Office	Communication
Aldersgate	Youth Camp

Source: City of Turner. <http://cityofturner.org/>

16.5.1 Transportation

- Delaney Rd is the link to I-5 – this would be under water in a major flood.
 - This road is the most vulnerable link – water on the road would be very destructive and block access.
- Third St (Turner Rd.) is the link to Hwy 22 – this would be under water in a major flood.
- Witzle Rd. would become the exit if the other roads were blocked.
- There are a few backroads that exist that don't involve bridges.
- Cherriots Bus – Santiam Route #30X provides public transportation services for residents.

Bridges:

Table 16-1, City of Turner Bridge Inventory

Turner Bridge Inventory								
Road	Over	Owner	Construction	Co-Located Utility				
				Sewer	Water	Electricity	Natural Gas	Telecomm
Mill Creek Rd. / Denver St.*	Mill Cr.	Marion County	Concrete continuous	Yes	Yes	No	Yes	No
Delaney Rd. SE	Mill Cr.	Marion County	Prestressed Concrete	No	No	No	No	No
Wipper Rd.**	Bypass Canal	Marion County	Prestressed Concrete	No	No	No	No	No
55th Ave. SE	Bypass Canal	Marion County	Wood Nail Laminated	No	No	No	No	No
3rd St. SE***	Mill Cr.	Marion County	Prestressed Concrete	No	Yes****	No	Yes	No
5th St. *****	Mill Cr.	City of Turner	Prestressed Concrete	Yes	Yes	No	No	No

Source: City of Turner (2022). *Rebuilt in 2016; **Rebuilt in 2014; ***This bridge has a lower deck and debris collects on it during high water events; ****The water line is 8" diameter pipe; *****Rebuilt between 2021-2022.

16.5.2 Energy

- PGE provides the city with power and has a sub-station on 5TH Street by Mill Creek.
- NW Natural provides the city with natural gas and has distribution mains connected to the Third street and Denver Street bridges.
- The city gets fuel in town from Pratum Co-op and from Pacific Pride (by I-5).
 - Fuel access could be difficult if Delaney Road were not passable.
- Fuel storage: there are tanks at the gas station at 5235 Denver Street.
- Back-up power and fuel storage:
 - Fire has two 6kw diesel generators on engines E955 and E957 and keeps 15 gallons of gas and diesel at the fire station.

- The city has a 2kw, 3kw and 7.5kw gas portable generators and keeps 15 gallons of gas stored.

Location	Owner	Fuel Type	Capacity (in gallons)
City Hall / Public Works – Fuel Storage	City	Above ground diesel tank	55 Gal.
Generators – Top of the hill pump station	City	Diesel	150 kw, 200 Gal.
Generator – Lower Pump	City	Diesel	100 kw, 150 Gal.
Generator – Main sewer pump station, in 5 th St. Park	Salem	Diesel	35 kw, 50 Gal. tank
Generator – 1952 station generator	Fire	Diesel	60 kw
Mobile generator	Fire	Gas	(1) 2000 W portable on rescue unit

16.5.3 Water / Wastewater

Water:

- Turner purchases wholesale water from the City of Salem.
- The city has a storage and distribution system – 100,000-gallon water tank (redwood, that is in great shape); 400,000-gal water tank (only 6 years old and built with modern technology).
- The city currently does not have back-up water sources.
- Val View pump station can be accessed in two different ways.
- 3rd St pump station is on the main street so it should be accessible in an earthquake.

Wastewater:

- Turner contracts for the treatment of wastewater by the City of Salem.
 - Lift stations bring sewage to a forced main station on Kuebler Rd. – lift stations have emergency generators.
 - There are 2.5 miles of forced main sewer pipe that takes wastewater to the intersection of Kuebler and Turner Roads – this pipe would probably not withstand an earthquake.
 - If this pipe broke, there would be a sewer overflow into Mill Creek.
- Franzen Reservoir stores 100 million gallons of water for Salem. The reservoir is part natural, part constructed.
 - Salem was required by the Department of Water Resources to reevaluate the reservoir. As part of this, they had to do outreach about the inundation potential from the reservoir if it failed.

16.5.4 Communications

- The redwood water tank on Val View has some police radio equipment to connect with the dispatch center, METCOM.
- The police department has radio capabilities as a back-up if cell service is down.
- The water distribution system has its own radio system.
 - This system only requires a minimal amount of power, and it is possible to run the system without the radios.
- The city recently purchased a satellite phone (service provided by Global Star).
- The Fire station has a base radio, mobile in the trucks – dispatch connection infrastructure is outside the city – all of this is backed up.
- Wave Broadband provides cable internet.
- Turner Elementary School has fiber, and the new subdivision at Crawford Lake does have fiber provided by Viser, a fiber company based in Aumsville.
- Fiber optic cable runs along the railroad (the Seattle to San Francisco line).
- Cell towers:
 - AT&T Tower on private property – this has a generator.
 - Verizon and T-Mobile on the tower in 5th Street Park – this has a generator.

16.5.5 Emergency Services

Fire:

Turner Rural Fire Protection District, 7605 3rd St. Turner, Oregon (503) 743-2190. Also provides Emergency Medical Services that includes transport by ambulance.

Police / Public Works / City Hall:

City of Turner, 5255 Chicago St, SE Turner, Oregon (503) 743-2155

Emergency Operations Center:

7250 3rd St. Turner, Oregon, the City also has a local CERT team.

Medical:

- No medical locations within the City of Turner.
- Aumsville has a health clinic; Stayton has a hospital.

16.5.6 Cultural / Historical Resources

- Turner Memorial Tabernacle and Camp Meeting Grounds; Pioneer Lodge
- Masonic Hall
- Ball Brothers Grange and Dance Hall (old)
- Ball Brothers Grange (current)

- Davis Hall (at Turner Retirement Home)
- Events that may draw large crowds:
 - Lamb and Wool festival – 1st Saturday in June. This includes a parade with approximately 1,500 people passing through town.
 - 4th of July Fireworks drawing approximately 2000-3000 people.

16.5.7 Functional and Access Needs (Vulnerable Populations)

Schools:

- Turner Elementary School (Cascade School District)
- Aldersgate (youth camp)
- Cradle to Crayons (Daycare) at 7920 2nd St. – this is in the floodplain.

Assisted living:

- Turner Retirement Homes

Non-English speaking:

- There is still only a small non-English speaking community.
- Many Spanish speakers work at the local mill.

Access:

- People who live up the hill (in the Eastwood area) might find it hard to access in bad weather (for example, the roads were not passible during the last ice storm – too steep and slippery).
- Flooding impacts people in the lowlands.

See hazard sections below for potential hazard-related vulnerabilities to these facilities.

16.6 Plans and Policies

Table 16-2, City of Turner Plans and Policies

Document Name	Year
Water Systems Master Plan	2013
City of Turner Comprehensive Plan	
Turner Transportation System Plan	1999
Stormwater Master Plan	
Floodplain Ordinance	

16.7 Hazard Profile

Community Overview							
Community Name	Population	# Of Buildings	Critical Facilities ¹	Total Building Value (\$)			
Turner	2,410	1,365	3	421,185,000			
Hazus-MH Analysis Summary							
Hazard	Scenario	Potentially Displaced Residents	% Potentially Displaced Residents	Damaged Buildings	Damaged Critical Facilities	Lost Estimate (\$)	Loss Ratio
Flood ²	1% Annual Chance	596	24.7%	347	1	5,849,000	1.4%
Earthquake	Mt. Angel Mw 6.8 Deterministic	9	0.4%	55	0	11,885,560	2.8%
Exposure Analysis Summary							
Hazard	Scenario	Potentially Displaced Residents	% Potentially Displaced Residents	Exposed Buildings	Exposed Critical Facilities	Building Value (\$)	Exposure Ratio
Landslide	High and Very High Susceptibility	300	13%	149	0	42,486,000	10%
Channel Migration	Channel Migration Zone	0	0%	0	0	0	0%
Wildfire	High and Moderate Risk	50	2.1%	28	0	6,515,452	1.5%
Lahar	Medium Zone (1000 to 15000 – Year)	0	0%	0	0	0	0%
¹ Facilities with multiple buildings were consolidated into one building complex. ² No damage is estimated for exposed structures with “First floor height” above the level of flooding (base flood elevation).							

Source: DOGAMI (2022)

16.8 Hazard Analysis

The methodology for assessing risk was the same for all jurisdictions and a detailed description of the BOLD planning methodology can be found in Volume I, a brief description is below. To complete the risk assessment, the jurisdiction representatives first updated the description, type, location, and extent of each hazard. Next, they updated the Hazard Vulnerability Analysis based on each hazard’s potential impact on the community using a calculated priority risk index (CPRI) methodology developed by BOLD Planning⁶. This assessment method ranks the following factors to determine risk from the range of hazards identified:

1. Probability (frequency) of event.
2. Magnitude of event.
3. Expected warning time before event.
4. Expected duration of event.

Score	Probability	Warning Time	Magnitude/Severity	Duration
4	Highly Likely	Less than 6 hours	Catastrophic	More than 1 week
3	Likely	6-12 hours	Critical	Less than 1 week
2	Possible	12-24 hours	Limited	Less than 1 day
1	Unlikely	24+ hours	Negligible	Less than 6 hours

The assessment identifies three levels of risk: High, Moderate and Low.

High - High probability of occurrence; at least 50 percent or more of population at risk from hazard; significant to catastrophic physical impacts to buildings and infrastructure; major loss or potential loss of functionality to all essential facilities (hospital, police, fire, EOC and shelters).

Moderate - Less than 50 percent of population at risk from hazard; moderate physical impacts to buildings and infrastructure; moderate potential for loss of functionality to essential facilities.

Low - Low probability of occurrence or low threat to population; minor physical impacts.

IMPACT	Range Values	
	Low CPRI	High CPRI
High	3.0	4.0
Moderate	2.0	2.9
Low	1.0	1.9

A summary of the risk assessment findings and rankings is presented below.

Table 16-3, City of Turner, including Turner Fire District, Hazard Vulnerability Assessment – Natural Hazards

Hazard Profile Summary City of Turner including Turner Fire District Using BOLD Planning Analysis Scoring						
Non-Natural Hazard	Probability	Warning Time	Magnitude	Duration	CPRI	2022 Local Planning Significance
Weight Factor	0.45	0.15	0.3	0.1		
Flood (riverine)	4	4	3.5	2.5	3.7	High
Earthquake	3	4	3.5	4	3.4	High
Severe Weather/Storm	4	1	3	3	3.2	High
Flood*	3	2	2.5	2.5	2.7	Moderate
Wildland Interface Fire	3	2	2.5	2.5	2.65	Moderate
Drought	3	1	2.5	3	2.6	Moderate
Extreme Weather - High Temperature	3	1	2.5	3	2.6	Moderate
Tornado**	2	4	2	2	2.3	Moderate
Landslide	2	2	2	3	2.1	Moderate
Avalanche***	1	2	2	2.5	1.6	Low
Volcanic Eruption	1	1	2	2.5	1.5	Low

Source: BOLD Planning Risk Assessment Method; Analysis by Marion County Emergency Management, Turner Fire District, and DLCD on 10/5/21.*Includes dam failures; **Split from Severe Weather in 2021; ***New in 2021.

Table 16-4, City of Turner, including Turner Fire District, Hazard Vulnerability Assessment – Other Hazards

Hazard Profile Summary City of Turner including Turner Fire District Using BOLD Planning Analysis Scoring						
Non-Natural Hazard	Probability	Warning Time	Magnitude	Duration	CPRI	2022 Local Planning Significance
Weight Factor	0.45	0.15	0.3	0.1		
Chemical, Biological, Radiological, Nuclear, Explosive	2	4	3.5	4	3.0	High
Public Health	3	1	3.5	4	3.0	High
Terrorism/Active Shooter/Workplace Violence	2	4	3.5	4	3.0	High
Unauthorized Entry	2	4	3	3	2.7	Moderate
Cyberterrorism	2	4	2.5	4	2.7	Moderate
Fire - Residential / Commercial (Arson)	2	4	2.5	3.5	2.6	Moderate
Hazardous Materials - Non-Transportation	2	4	2.5	2.5	2.5	Moderate
Hazardous Materials Release - Transportation	2	4	2.5	2.5	2.5	Moderate
Agricultural Terrorism	2	1	2.5	2.5	2.1	Moderate

Source: BOLD Planning Risk Assessment Method; Analysis by Marion County Emergency Management, Turner Fire District, and DLCDD on 10/5/21.

16.9 Hazard Characteristics

Hazard History, Characteristics and Extent for Marion County apply also to the City of Turner. Volume I, Section 2, Risk Assessment, adequately describes the characteristics of natural hazards, as well as the location and extent of potential events. This section identifies vulnerabilities specific to Turner, recent localized hazard events and impacts, and illustrates the basis for the city's HVA scores.

16.9.1 Avalanche

CPRI = 1.6, Risk Level: Low

Events: Not Reported

Vulnerability: Not Reported

16.9.2 Flood (Dam Failure)

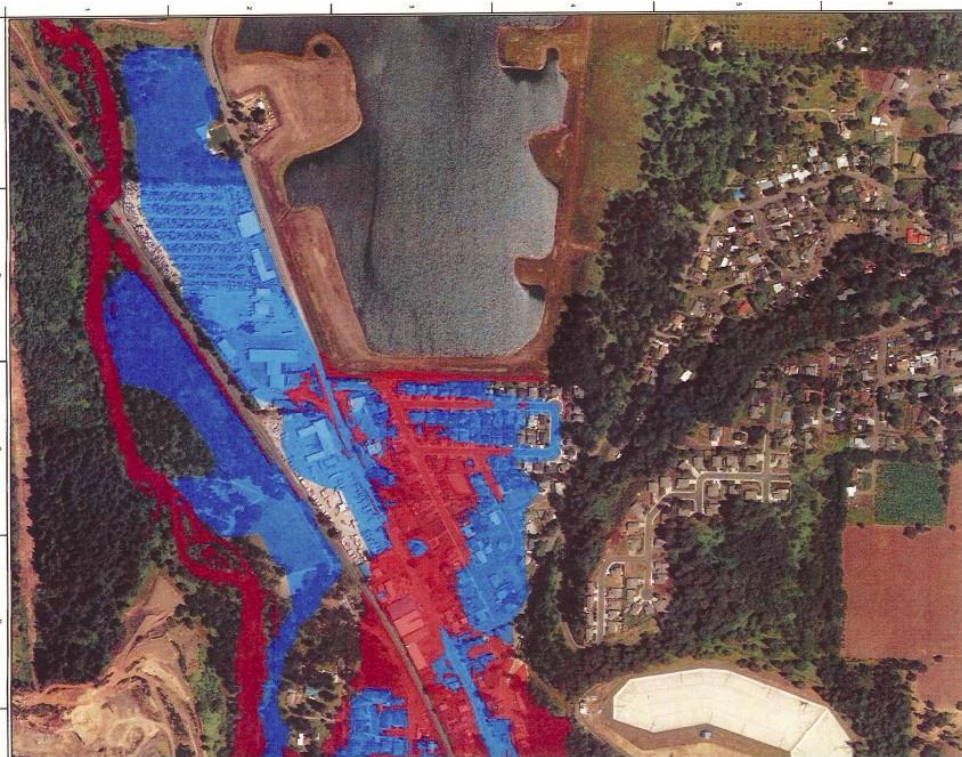
CPRI = 2.7, Risk Level: Moderate

Events: There is no history of dam failure in the City of Turner.

Vulnerability: Dams are impervious structures that block the flow of water in a river or stream, capturing water behind the dam. Dams can fail for a variety of reasons, such as erosion, overtopping, structural failure, ground motion or unusual hydrodynamic forcing.

The City of Salem has a water reservoir in Turner city limits—the Franzen Reservoir. Turner coordinates with City of Salem on development review for any projects near the reservoir.

Figure 16-3, Franzen Reservoir Partial Inundation Map



Source: City of Turner

The Franzen Reservoir poses a “high hazard” dam threat to the city of Turner. In 2014, the Oregon Dam Safety Program Engineer reclassified Franzen Reservoir as a HIGH hazard dam following a review by a local hydraulic engineer and US Army Corps of Engineers. The reservoir is 31-feet high and stores 300-acre feet of water. According to the Oregon Dam Safety Engineer, there are several dwellings located directly below the reservoir inundation area. In addition, the area of Delaney Road SE and North 3rd Street would be impacted by a reservoir breach.

The primary Army Corps of Engineers controlled dam threat to the City of Turner is the Detroit Dam. Contact the local Army Corps office for more information about specific dam failure and inundation impacts that could result from a failure at Detroit Dam.

16.9.3 Drought

CPRI = 2.6, Risk Level: Moderate

Events: Due to a cool, wet climate, past and present weather conditions have generally spared Marion County communities from the effects of drought; however, Marion County was included in Presidential Drought Declarations in 1992 and 2015.

Vulnerability: Turner receives water from the City of Salem under contract. Turner maintains two water tanks for local storage, with 100,000- and 400,000-gallon capacities respectively. The larger tank was constructed in 2011 using modern engineering and construction methods. The city also maintains a water distribution system. The city does not have a secondary water source. Additional, drought-related community impacts are described within the county’s Drought Hazard Annex.

16.9.4 Earthquake

CPRI = 3.4, Risk Level: High

Events: The 1993 Scott Mills quake caused \$28 million in damages to cities throughout Marion County. No damaging earthquake events occurred during the previous five years.

Vulnerability: Turner is about one mile from several active faults: a string of faults run to both the north and south of Turner.

Turner’s probability for a Crustal Earthquake event is “possible” and their vulnerability to a Crustal Earthquake event is “limited”. The county steering committee determined that the probability for a Cascadia Subduction Zone (CSZ) Earthquake event is “highly likely” and that the vulnerability to a Cascadia Earthquake event is “catastrophic”. This hazard was not rated as distinct CSZ and crustal events in the previous HMP.

Earthquake-induced damages are difficult to predict, and depends on the size, type, and location of the earthquake, as well as site-specific building and soil characteristics. Presently, it is not possible to accurately forecast the location or size of earthquakes, but it is possible to predict the behavior of soil at any site. In many major earthquakes, damage has primarily been caused by the behavior of the soil.

The Turner steering committee identified earthquake damage to bridges and nearby dams as a primary concern. Transportation isolation and inundation due to dam failure could both have significant impacts on the city. The City's priority actions reflect these concerns.

16.9.5 Flood

CPRI = 3.7, Risk Level: High

Floodplain Management: Turner conducts very active floodplain management. A floodplain permit is required for all applications for development; the city retains a floodplain manager on staff. In 2022, this is the City Manager. Recently an old building met the substantial improvement criteria and was removed and replaced with an elevated manufactured home. A local church in town bought a commercial building and they were required to elevate the floor. The city now owns "Turner Lake," a gravel pit deeded to the city, to which a park was added. However, this is not a flood risk, simply a change in development.

Events: The last large flood event in Turner was in 2012. In January of 2012, heavy rains caused extensive flooding throughout the city, with an estimated \$500,000 in overall damage. During a five-day period starting on January 16th, the city received as much as 9.1 inches of rain. Runoff from the heavy rainfall was intensified by the melting of three to six inches of snow that had fallen in higher elevations the previous week. On March 2, 2012, the President issued a major disaster declaration (DR-4055).

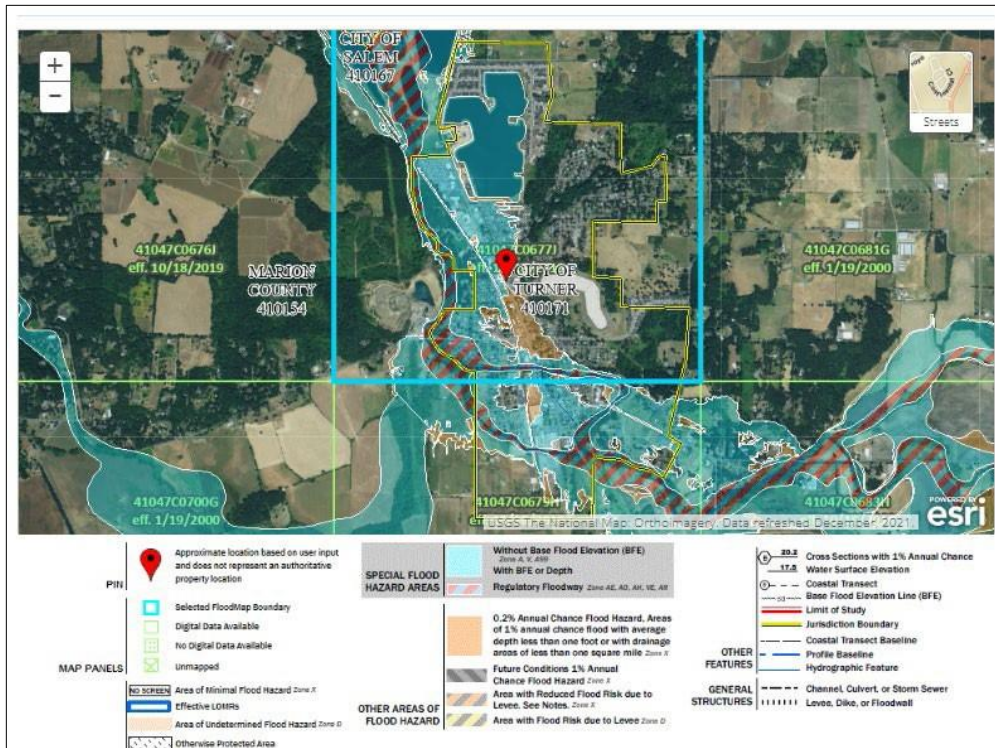
The preliminary damage assessment from the January 2012 flood revealed 13 residences and three businesses with major damage, 14 residences and three businesses with minor damage, and two residences with other damage. Later, the city documented more than 80 homes that had suffered flood damage. In addition, damage from the sewer system resulted in more than 100 households using portable toilets set up in the street.

The flood event stretched local resources well beyond capacity, putting the entire town at risk. Issues confronted included: fire hydrants and water valve box piping were destabilized by the flood and ready to break; structural damage to bridges and road shoulders making use of narrow road corridors dangerous; all of the roads in and out of Turner were closed at one point with 75% remaining closed for multiple days; hundreds of individual evacuations; heavy flood waters directly impacted two businesses forcing one to close permanently; all downtown businesses were closed off to customers due to road closures, including the major mill complex in town; shut-off and later re-activation of the natural gas system created risk for potential explosions and fires.

Since the major flood in January 2012, Turner has experienced other near-floods and high-water events. Mill Creek, which runs through the middle of town, presents the greatest flood risk to residents and travelers. Many residences and businesses are located within the 100-Year Floodplain.

Vulnerability: The very large floodplain of Mill Creek (near Salem) and its tributaries from City of Turner to Salem corresponds to high levels of urban development. This area is at high risk to flood hazard. In the City of Turner, nearly a third of the buildings exposed to flooding are elevated above the base flood elevation (State of Oregon, Department of Land Conservation and Development, N.d.).

Figure 16-4, Special flood hazard area



Source: FEMA Map Service Center, <https://msc.fema.gov/>

National Flood Insurance Program (NFIP)

The NFIP has two types of loss classifications, Repetitive Loss (RL) Property and Severe Repetitive Loss (SRL) Property. **RL**, property is any insurable building for which two or more claims of more than \$1,000 were paid by the National Flood Insurance Program (NFIP) within any rolling ten-year period, since 1978. A RL property may or may not be currently insured by the NFIP. **SRL** property is a single family property (consisting of 1 to 4 residences) that is covered under flood insurance by the NFIP and has incurred flood-related damage for which 4 or more separate claims payments have been paid under flood insurance coverage, with the amount of each claim payment exceeding \$5,000 and with cumulative amount of such claims payments exceeding \$20,000; or for which at least 2 separate claims payments have been made with the cumulative amount of such claims exceeding the reported value of the property.

FEMA modernized the Turner Flood Insurance Rate Maps (FIRMs) in January of 2003. Table shows that as of October 2016, Turner has 71 National Flood Insurance Program (NFIP) policies in force. Of those, 26 are for properties that were developed before the development of the initial FIRM. The last Community Assistance Visit (CAV) for Turner was on February 6, 2012. Turner is not a member of the Community Rating System (CRS). The table shows that most of the flood insurance policies are for single-family residential homes. There have been 21 paid flood claims in Turner totaling \$588,084. The Community Repetitive Loss record for Turner identifies one Repetitive Loss Property (a residential parcel near Mill Creek) and no Severe Repetitive Loss Properties.

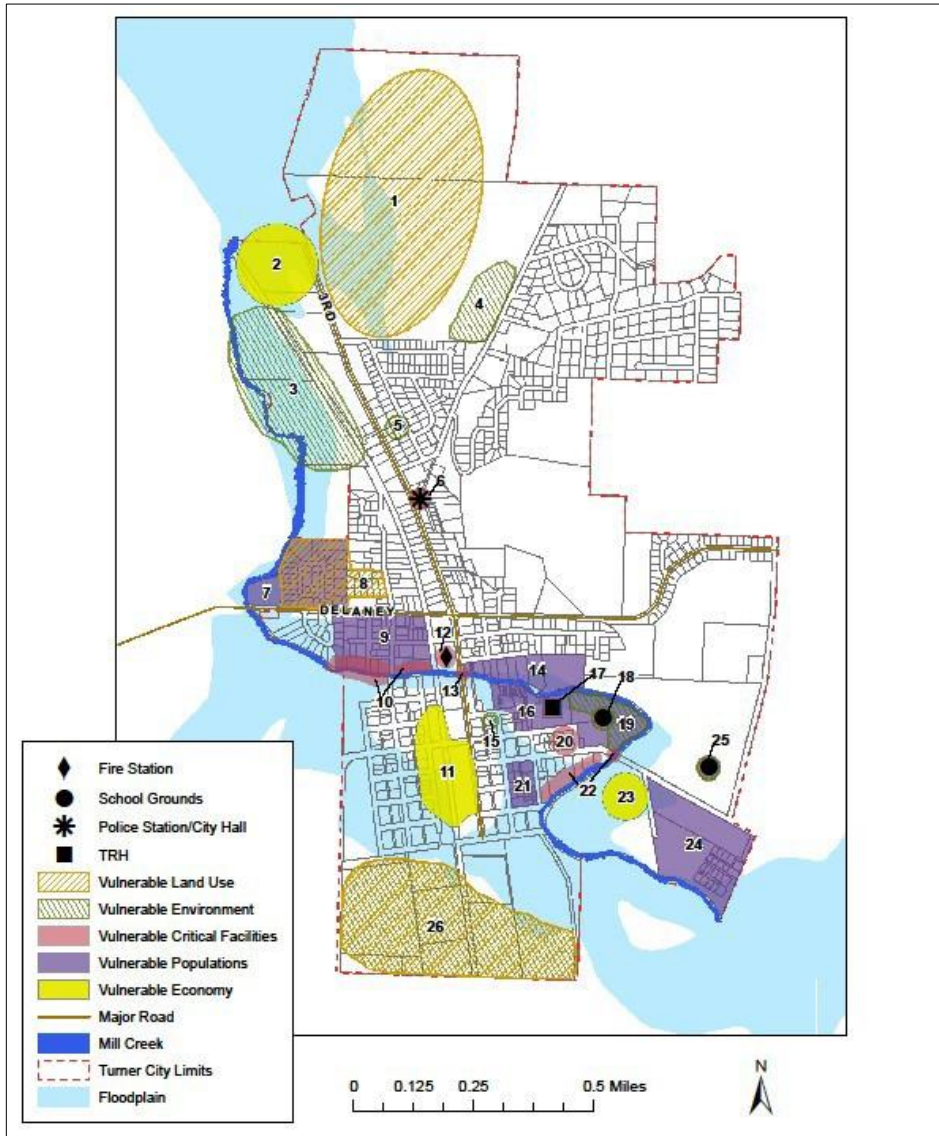
Table 16-5, Flood Insurance Detail

Jurisdiction	Effective FIRM and FIS	Initial FIRM Date	Total Policies	Pre-FIRM Policies	Policies by Building Type				Minus Rated A Zone	Minus Rated V Zone
					Single Family	2 to 4 Family	Other Residential	Non-Residential		
Marion County	-	-	2,067	1,239	1,614	115	105	232	97	0
Turner	1/2/2003	4/2/1979	71	26	65	3	0	3	1	0

Jurisdiction	Insurance in Force	Total Paid Claims	Pre-FIRM Claims Paid	Substantial Damage Claims	Total Paid Amount	Repetitive Loss Structures	Severe Repetitive Loss	CRS Class Rating	Last Community Assistance
Marion County	\$ 514,268,700	298	226	16	\$ 5,732,543	11	2	-	-
Turner	\$ 17,010,300	21	18	3	\$ 588,084	1	0	N/A	2/6/2012

Source: Information compiled by Department of Land Conservation and Development, October 2016.

Figure 16-5, Turner's Flood Vulnerability



Source: City of Turner 2012 NHMP Steering Committee.

16.9.6 Landslide

CPRI = 2.1, Risk Level: Moderate

Events: n/a

Vulnerability: Turner has a relatively flat topography, except for the Eastwood area in the northeastern part of the town, near the Franzen Reservoir, and directly to the east between Turner and I-5. Turner's probability for landslide is unlikely and their vulnerability to landslide is limited.

16.9.7 Severe Weather

CPRI = 3.2, Risk Level: High

Windstorm:

The city's probability for windstorm is highly likely and their vulnerability to windstorm is critical.

Significant wind events occur in Turner each year, usually between October and March. Damaging wind events are only slightly less common; once or twice per year the city will experience a windstorm event that will interrupt services, experience downed trees, and cause power outages. The F-2 tornado that touched down in Aumsville in December 2010, only four miles from Turner, did not cause damage to Turner.

Because windstorms typically occur during winter months, they are sometimes accompanied by ice, freezing rain, flooding, and very rarely, snow.

Winter Storm (Snow/Ice):

Severe winter storms can consist of rain, freezing rain, ice, snow, cold temperatures, and wind. They originate from troughs of low pressure offshore that ride along the jet stream during fall, winter, and early spring months. Severe winter storms affecting the city typically originate in the Gulf of Alaska or in the central Pacific Ocean. These storms are most common from November through March.

Major winter storms can and have occurred in the Turner area, and while they typically do not cause significant damage, they are frequent and have the potential to impact economic activity. It becomes difficult to access the Eastwood area in the northeast of the city because ice can make the steep roads impassable. The most recent winter storms (December 2016 – January 2017 and February 2021) included snow and freezing rain and ice, transportation and power interruptions, loss of all internet service, loss of all cellular phone service and government office and school closures.

16.9.8 Tornado

CPRI = 2.3, Risk Level: Moderate

Events: The F-2 tornado that touched down in Aumsville in December 2010, only four miles from Turner, did not cause damage to Turner.

Vulnerability: Risk of damage to buildings, power outages, and road closures.

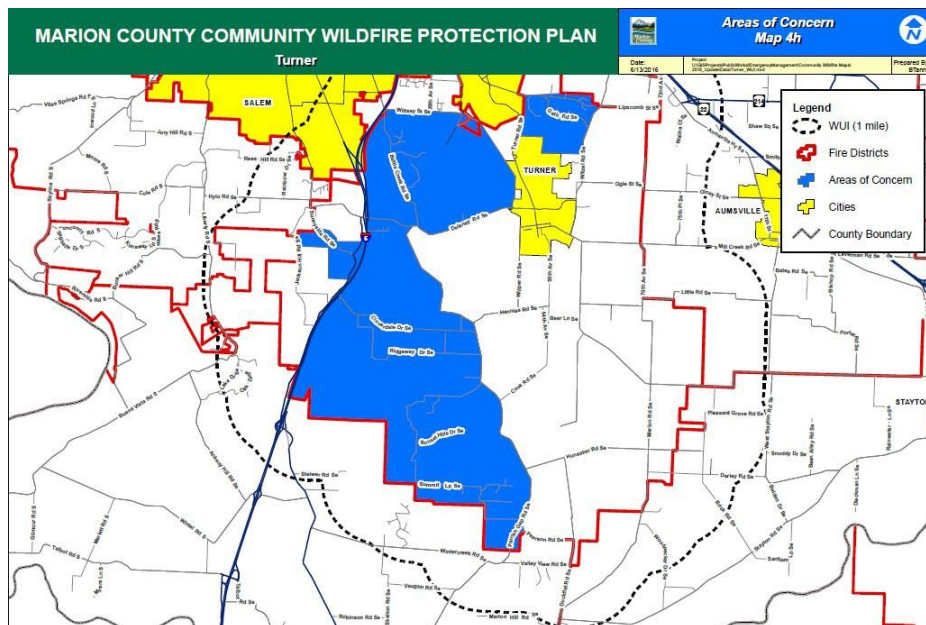
16.9.9 Wildfire

CPRI = 2.65, Risk Level: Moderate

Events: Turner is surrounded by open farmland, forests, or waterways. Although Turner has some forested areas within the city limits, there is no history of wildfire events in Turner.

Vulnerability: The County updated the Community Wildfire Protection Plan (CWPP) in 2016 and portions of Turner are listed as having wildland urban interface (WUI) with areas of concern. Figure depicts the areas near Turner that the CWPP identifies as areas of concern. These areas should be targeted for fire mitigation activities.

Figure 16-6, Wildfire areas of concern near Turner



Source: Marion County Community Wildfire Protection Plan (2016).

16.9.10 Volcanic Eruption

CPRI = 1.5, Risk Level: Low

Events: Not Reported

Vulnerability: Ashfall only

16.10 Mitigation Strategy

During the 2022 Marion County Hazard Mitigation Plan and Turner Addendum update process, Oregon Department of Land Conservation & Development and the City of Turner developed a list of priority actions. These actions were prioritized and then reviewed internally by staff and city council during the spring of 2022.

Mitigation Success Story: Regional Flood Mitigation Initiative

Starting with flood early warning system, the City of Turner has built a coalition of partners that are committed to implementing flood mitigation strategies. These partners include Marion County, the City of Salem, Aumsville, the Beaver Creek Watershed Board, the Santiam Water Control District, and the State of Oregon. In December, this coalition applied for a \$400,000 grant to study flood detention possibilities in Mill Creek. In the future, these partners will continue working together to find and implement flood mitigation projects in the Middle Willamette watershed.

16.10.1 Mitigation Successes

- Stormwater Infrastructure Upgrades: The City has invested about \$15,000 in building and upgrading storm water systems where rainwater has historically damaged property and threatened roadway stability.
- Turner Elementary School received \$1.2 million for seismic retrofits from the State.
- The Mid-Willamette Valley High Water Watch <https://hww.onerain.com/> is a live data tool which is the result of long-term coordination with Turner, regional partners, and the City of Salem who have a full-time staff person that maintains the website.
- Completed 17-MH-02: Implement an automated notification system for disaster alerts and preparedness.
- Regional flood mitigation initiative: Mill Creek flood detention study.
- PGE requires undergrounding of power lines so new development in Turner has reduced risk from power outages and wildfire.

Mitigation Success Story: Stormwater Infrastructure Upgrades

Since Turner’s 2012 Hazard Mitigation Plan, the City has invested about \$15,000 in building and upgrading storm water systems where rainwater has historically damaged property and threatened roadway stability. These projects have helped minimize localized flooding, improving the city’s ability to remain functional during storm and high-water events.

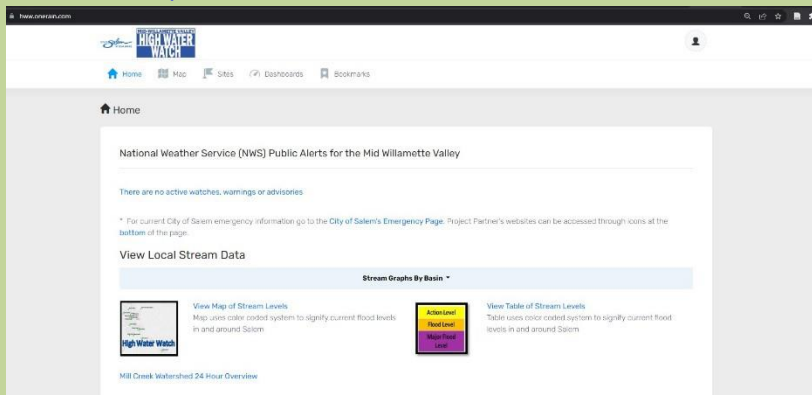
Mitigation Success Story: Flood Monitoring Infrastructure

After a 2012 storm caused a severe flood in Turner, the City partnered with the State and the City of Salem to implement a rain and stream gauge monitoring system to provide early warning for future floods.

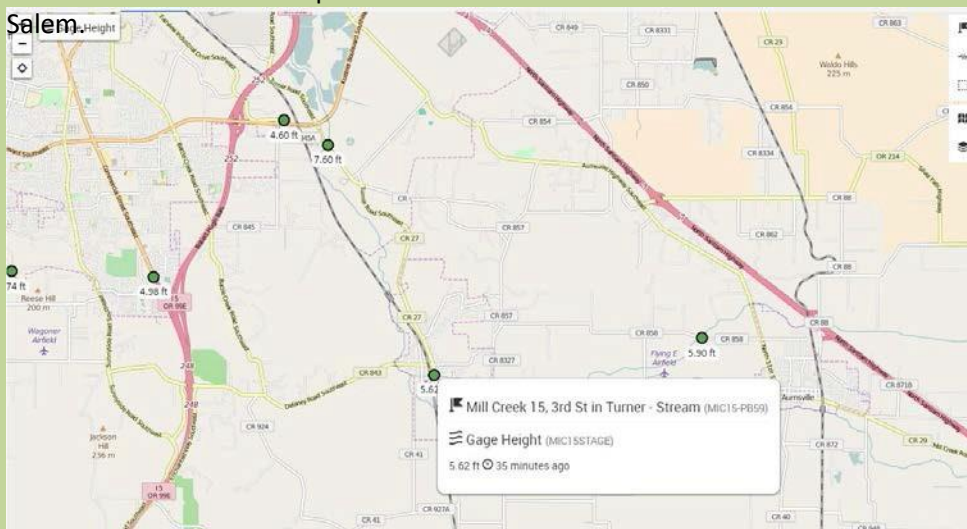


The jurisdictions used \$200,000 from the Hazard Mitigation Grant Program to build the infrastructure and website that make up the early warning system.

As pictured below, residents can visit the Mid-Willamette Valley High Water Watch website at <https://hww.onerain.com/>



The website features a map with real-time data about stream levels in and around Salem.

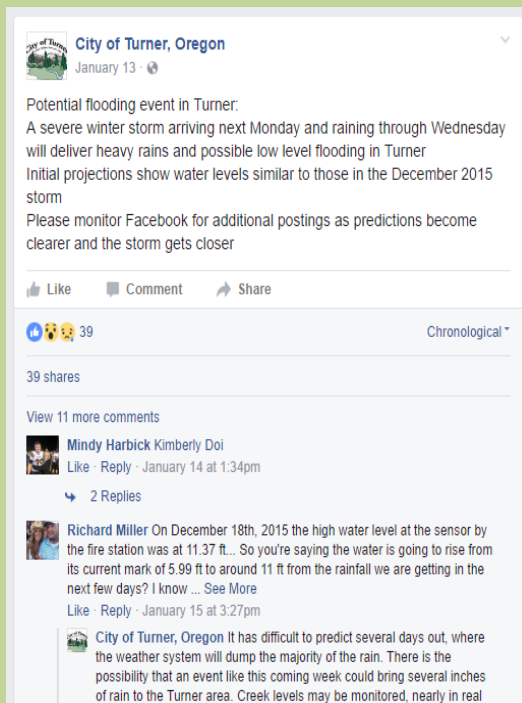


Mitigation Success Story: Flood Early Warning System

To complement the flood monitoring system (see Mitigation Success Story: Flood Monitoring Infrastructure), Turner has also been actively working to improve communication with residents regarding floods and other hazard events.

The City purchased a contract with Everbridge (an emergency mass communication tool) and has been collecting cell phone numbers for entire community. This “reverse 911” system allows the city to send out notifications about hazards. For example, the city can send a text alert about flood warnings when the flood monitoring systems indicates high water may be on the way.

In addition to the Everbridge system, the city actively uses Facebook for weather- and flood- related notices and advisories. Residents actively engage with the City’s Facebook page, sharing notifications with their networks and quickly spreading the word about potential hazards that may affect the community. Additionally, the Facebook page helps the city advertise for upcoming preparedness events (see post below.)



16.10.2 Ongoing Actions

- Meet with City of Salem flood and emergency management staff on an annual basis to identify and implement collaborative flood mitigation project opportunities.
- Provide public outreach and education to vulnerable populations (such as Turner retirement homes, the Christian Convention, Aldersgate, and others, as identified in this plan) regarding hazards.
- Partner with existing community organizations to disseminate hazard preparedness information.
- Use existing city public engagement tools (such as monthly utility bills, public reader boards, Facebook pages, etc.) as means of disseminating information to residents regarding hazard preparedness.
- Support annual emergency management tabletop exercises that include hazardous material release scenarios (in addition to other hazard scenarios).
- Meet with the City of Salem each year to receive updates on the Franzen Reservoir and notify the public of any changes to safety.
- Maintain & cultivate partnerships with other government agencies, both local and regional, to plan for flood hazard events.
- Develop MOUs with private businesses and citizens around equipment and resource sharing during severe weather events.
- Monitor the trees in the public right-of-way and maintain to minimize damage during wind or winter storms.
- Support the wildfire prevention outreach to residents in areas where wildfire is a potential concern (e.g., hillside neighborhoods in NE Turner).

16.10.3 City of Turner Mitigation Action Table

The table below (Table 16.6) shows the City of Turner mitigation actions.

Table 16-6, City of Turner Priority Mitigation Actions

2023-2027 City of Turner Priority Mitigation Actions							
#	Hazard	Mitigation Action/Description	Priority	Timeline	Cost	Coordinating Organization	Status
20223-FL-1	Flood	Pursue and complete remapping of City floodplain. Turner was recently remapped, but as a part of their floodplain management plan it is possible the need for remapping will arise again. A new neighborhood was added due to uncertified railroad	M	2-5 Years	\$100,000	City of Turner	Started
2022-FL-2	Flood	Widen the Perrin bypass and reinforce levee to accommodate flood flows. Funding: Advanced Assistance, FMA	H	2-5 Years	\$2,000,000	City of Turner	New
2022-MH-1	Multi-Hazard	Purchase a portable water filtration device. Was 17- P-3 from the 2017 HMP	M	1-3 Years	\$10k	City of Turner	Started
2022-MH-2	Multi-Hazard	Encourage documentation of the vulnerable populations listed in the Plan, including the creation and maintenance of a list of residents with special medical needs. Was 17 M-H 3 in the 2017 HMP	M	1-3 Years	Staff Time	City of Turner	Started
2022-MH-3	Multi-Hazard	Support the retrofit the fire station to withstand flood and earthquakes. Lead: Turner Fire. In the design stage. Plans in the works to elevate the station.	H	2-5 Years	Staff Time	Turner Fire District	Started
2022-LS-1	Landslide	Implement the Eastwood Drive Stabilization Plan and continue ongoing monitoring of conditions. Alternatives have been identified; the preferred containment option is being assessed. Additional work could include tree removal and bank stabilization using various methods. Funding: City budget for landslide barriers along the roadway in 2022.	H	2-5 Years	\$50,000	City of Turner	Started

#	Hazard	Mitigation Action/Description	Priority	Timeline	Cost	Coordinating Organization	Status
2022-MH-4	Multi-Hazard	Support annual emergency management tabletop exercises by Marion County that include hazardous material release scenarios (in addition to other hazard scenarios). Was 17-MH-5 in the 2017 HMP.	M	1-3 Years	Staff Time	City of Turner	Ongoing
2022-WF-1	Wildfire	Support fire mitigation outreach throughout the Fire District including defensible space and fire-resistant materials.	M	1-3 Years	Staff Time	City of Turner	New
2017-2022 City of Turner Action Items Status Update							
#	Hazard	Mitigation Action/Description	Coordinating Organization		Partnering Organization		Status
2017-P-1	Flood	Add water level monitoring equipment to the Marion Road Bridge, south of Mill Creek.	City of Turner		CERT, Mill Cr. Basin Flood Mgmt. agency		Discontinue
2017-P-2	Flood	Meet with City of Salem flood and emergency management staff on an annual basis to identify and implement collaborative flood mitigation project opportunities. City of Salem stormwater/utility funded. Discuss and maintain monitoring equipment; frequent meetings	City of Turner		Turner Public Works, City of Salem, Marion Co., OEM, City of Aumsville, Beaver Cr WSC, Santiam WSC		Ongoing
2017-P-3	Multi-Hazard	Purchase a portable water filtration device.	City of Turner Public Works		City of Turner		Started
2017-P-4	Multi-Hazard	Provide public outreach and education to vulnerable populations (such as Turner retirement homes, the Christian Convention, Aldersgate, and others, as identified in this plan) regarding hazards.	City of Turner		Turner Police, Turner Fire District, Marion County		Ongoing
2017-P-5	Multi-Hazard	Partner with existing community organizations to disseminate hazard preparedness information.	City of Turner		Turner Police, Turner Fire, Turner Christian Church, Cascade School District, Church of God, Turning Point		Ongoing

#	Hazard	Mitigation Action/Description	Coordinating Organization	Partnering Organization	Status
2017-MH-1	Multi-Hazard	Use existing city public engagement tools (such as monthly utility bills, public reader boards, Facebook pages, etc.) as means of disseminating information to residents regarding hazard preparedness.	City of Turner Police	City Administrator; Public Works; Turner Fire; Turner Christian Church, Portland General Electric; North Marion School District; MCEM	Ongoing
2017-MH-2	Multi-Hazard	Implement an automated notification system for disaster alerts and preparedness.	City of Turner	Turner Police Dept., Turner Fire District, Community Emergency Response Team (CERT), MCEM	Complete
2017-MH-3	Multi-Hazard	Encourage documentation of the vulnerable populations listed in the Plan, including the creation and maintenance of a list of residents with special medical needs.	City of Turner	Turner Police Dept., Turner Fire District	Started
2017-MH-4	Multi-Hazard	Retrofit the fire station to withstand flood and earthquakes or construct a new, seismically-sound fire station outside the flood zone in a location at minimal risk to natural and man-made hazards. Lead: Turner Fire. In the design stage. Plans in the works to elevate the station.	Turner Fire District	City Administrator, OEM, Business Oregon Seismic Rehab Grant Program	Started
2017-MH-5	Multi-Hazard	Support annual emergency management tabletop exercises that include hazardous material release scenarios (in addition to other hazard scenarios).	Turner Fire District	Community Emergency Response Team (CERT), MCEM, Union Pacific	Ongoing
2017-DF-1	Dam Failure	Coordinate with Marion County Emergency Management to develop an evacuation plan for the City of Turner in the event of a dam failure.	City of Turner	Marion County Emergency Management, Marion County Sheriff's Office	Started
2017-DF-2	Dam Failure	Coordinate with Marion County Emergency Management and the Army Corps of Engineers to develop a dam failure notification procedure for the City of Turner.	City of Turner		Started

#	Hazard	Mitigation Action/Description	Coordinating Organization	Partnering Organization	Status
2017-DF-3	Dam Failure	Meet with the City of Salem each year to receive updates on the Franzen Reservoir and notify the public of any changes to safety.	City of Turner	City of Salem	Ongoing
2017-DF-4	Dam Failure	Actively engage with the County's efforts to work with the Army Corps of Engineers to assess dam failure likelihood and risks.	City of Turner Police	Turner Fire, City Administrator, Army Corps of Engineers, MCEM	Started
2017-EQ-1	Earthquake	Perform seismic assessments of critical infrastructure as resources become available.	City of Turner	N/A	Started
2017-EQ-2	Earthquake	Send city staff and other to the County's ATC 2.0 structural assessment training when the course is offered.	City of Turner	N/A	Started
2017-FL-1	Flood	Provide more training on flood insurance. Funded by City budget. Nearly complete. Brought in an insurance specialist to help community members understand the best way to improve their flood vents and other flood insurance reduction efforts.	City of Turner	Oregon DLCD, OEM, FEMA, FEMA trainers.	Completed
2017-FL-2	Flood	Identify and prioritize properties to be retrofitted against flood damage. Coordination with 17-FL-01	City of Turner	DLCD	Not Started
2017-FL-3	Flood	Have City Council evaluate pursuing certification in the Community Rating System (CRS).	City of Turner	DLCD, FEMA, City of Salem, Marion Co Public Works	Started
2017-FL-4	Flood	Implement annual flood vent inspection program for all residential properties in areas at risk of chronic flooding (inside and outside of the mapped floodplain). Continue if CERT is involved, maybe discontinue if not	City of Turner Planning/Building	CERT, DLCD	Started

#	Hazard	Mitigation Action/Description	Coordinating Organization	Partnering Organization	Status
2017-FL-5	Flood	Work with owners of repetitive loss buildings in the city to identify cost effective mitigation strategies including consideration of elevation or buy-out.	City of Turner	DLCD, OEM	Not Started
2017-FL-6	Flood	Pursue and complete remapping of City floodplain. Turner was recently remapped, but as a part of their floodplain management plan it is possible the need for remapping will arise again. A new neighborhood was added due to uncertified railroad.	City of Turner	DLCD, OEM, FEMA	Started
2017-FL-7	Flood	Provide annual public information materials to Turner residents regarding flood safety practices, including detailed information about sandbagging. General public information on a regular basis. During events, targeted information and support for sandbagging stations is provided. Specific messaging to residents in the floodway to deter debris mobilizing in flood events.	City of Turner	City of Turner, CERT	Ongoing
2017-FL-8	Flood	Maintain & cultivate partnerships with other government agencies, both local and regional, to plan for flood hazard events.	City of Turner	Marion Co., Salem, MWVCOG, Mill Creek Basin flood mgmt. agencies.	Ongoing
2017-FL-9	Flood	Pursue hiring a flood coordinator to address flood-related action items. These duties are managed by the City Administrator.	City of Turner	MWVCOG	Discontinue
2017-LS-1	Landslide	Implement the Eastwood Drive Stabilization Plan and continue ongoing monitoring of conditions. Alternatives have been identified; the containment option is being implemented. Additional work could include tree removal and bank stabilization using various methods. Funding: City budget for	City of Turner Public Works		Started

#	Hazard	Mitigation Action/Description	Coordinating Organization	Partnering Organization	Status
2017-SW-1	Severe Weather	landslide barriers along the roadway '22. Develop MOUs with private businesses and citizens around equipment and resource sharing during severe weather events. MOUs with Police, Fire, Marion Co. Public Works, local contractors. Refresh and keep up to date	City of Turner	Marion Co Public Works, Turner Public Works, Police, Fire	Ongoing
2017-SW-2	Severe Weather	Monitor the trees in the public right-of-way and maintain to minimize damage during wind or winter storms.	City of Turner Public Works	PGE, Turner Fire District	Ongoing
2017-WF-1	Wildfire	Support the wildfire prevention outreach to residents in areas where wildfire is a potential concern (e.g., hillside neighborhoods in NE Turner). As outlined in the Marion County Community Wildfire Protection Plan (CWPP), Marion County and Turner Fire are lead on wildfire outreach. Marion County CWPP update is underway; and Turner is participating. The city works closely with Turner RFPD.	Turner Fire District	Marion County Fire Defense Board, Marion County Emergency Management, Oregon State Fire Marshal's Office	Ongoing
2017-WF-2	Wildfire	Support fire suppression mitigation outreach throughout the Fire District including defensible space and fire-resistant materials.	Turner Fire District	Marion County Fire Defense Board, Marion County Emergency Management, Oregon State Fire Marshal's Office	Ongoing

Source: City of Turner, 1/5/22 and 6/15/2022

17 City of Woodburn and Woodburn Rural Fire Protection District Addendum

17.1 Purpose

This document serves as a shared addendum for the City of Woodburn and the Woodburn Rural Fire Protection District (Woodburn Fire District or WFD) to the Marion County Multi- Jurisdictional Hazards Mitigation Plan (HMP). The purpose of this shared addendum is to guide the implementation of mitigation actions by Woodburn and Woodburn Fire District to improve the resilience of the community. Mitigation planning is a long-term endeavor—one that requires broad internal involvement and community engagement to be successful.

Finally, please refer to the information contained in Volume I (Basic Plan) and Volume III (Appendices) of this HMP, which provides additional information (particularly regarding participation and mitigation strategy) and forms the basis of this addendum.

17.2 Plan Process, Participation, and Adoption

In the summer and fall of 2021 Marion County partnered with the Oregon Department of Land Conservation and Development and the Oregon Department of Emergency Management (OEM), and Marion County cities, including Woodburn and Woodburn Fire District, to update their addendum to the Marion County Hazard Mitigation Plan, which expired August 16, 2022. This project is funded through the Federal Emergency Management Agency's (FEMA) FY19 Pre-Disaster Mitigation Competitive Grant Program (PDMC-PL-10-OR-2019-003).

By developing this addendum to the Marion County HMP, locally adopting it, and having it approved by FEMA, the Woodburn and Woodburn Fire District will gain eligibility for FEMA Hazard Mitigation Assistance (HMA) funding that includes three programs: Building Resilient Infrastructure & Communities (BRIC), formerly the Pre-Disaster Mitigation grant program, the Hazard Mitigation Grant Program (HMGP), and the Flood Mitigation Assistance (FMA) program.

Woodburn and Woodburn Fire District joined the Marion County HMP update by executing an intergovernmental agreement with DLCD on November 25, 2021, and January 30, 2022, respectively. On November 23, 2021, City of Woodburn Police Chief Marty Pilcher, Marion County Emergency Preparedness Coordinator Mike Hintz, and DLCD Planner Tricia Sears conducted a risk assessment meeting with the City of Woodburn that included a Hazard Vulnerability Assessment ranking. On January 12, 2022, Woodburn Fire Chief Joe Budge, Marion County Emergency Preparedness Coordinator Mike Hintz, and DLCD Planner Pamela Reber conducted a risk assessment meeting with the Woodburn Fire District that included a Hazard Vulnerability Assessment ranking. Chief Pilcher and Chief Budge met again with DLCD Planner Pamela Reber on July 13, 2022, to update this addendum.

Woodburn and Woodburn Fire District staff attended HMP Steering Committee meetings in October 2021 and March 2022.

The City of Woodburn/ Woodburn Fire District Steering Committee is comprised of the following representatives:

- Co-Convener, City of Woodburn Police Chief
- Co-Convener, Woodburn Fire District Fire Chief
- City of Woodburn Public Works Director
- City of Woodburn Building Official
- City of Woodburn Community Development Director
- City of Woodburn Senior Planner
- City of Woodburn Associate Planner
- City of Woodburn Police Executive Assistant
- Woodburn Police Department Patrol Division
- Woodburn Fire District Fire Marshal
- Woodburn Fire District CERT Coordinator

Woodburn used multiple approaches to engage the public. First, the City established steering committee representatives from across the city. Next, the city actively participated in countywide community engagement activities such as the community hazards survey.

Both jurisdictions promoted the HMP survey and outreach efforts throughout the plan update, including public posts on the city’s website, and messages sent out via the weekly e- blast in January 2022. Woodburn Fire District and their CERT volunteers shared and filled out the survey as well. City staff also presented the draft plan to the City Council during an open public council session. (See Appendix C for more information).

17.3 Risk Assessment

A risk assessment is intended to provide the “factual basis for activities proposed in the strategy to reduce losses from identified hazards” (Department of Homeland Security, Federal Emergency Management Agency, 2023). This section of the HMP addendum can serve as the factual basis for addressing Oregon Statewide Planning Goal 7 – Areas Subject to Natural Hazards.

17.4 Community Profile

This section provides information on city and district specific assets and populations. For additional information on the characteristics of Woodburn and Woodburn Fire District, in terms of geography, environment, population, demographics, employment and economics, as well as housing and transportation see Volume III, Appendix B, Community Profile. Many of these community characteristics can affect how hazards impact communities and how communities choose to plan for hazard mitigation. Considering the city specific assets during the planning process can assist in identifying appropriate measures for hazard mitigation.

Woodburn Fire District

The Woodburn Fire District was established in 1901. The current district contains 4 stations, 16 full time staff, and provides fire suppression, fire prevention services, and emergency medical assistance to residents located within its 75-square-mile boundary. The fire district boundary includes the city of Woodburn, the city of Gervais, and a large area of unincorporated northern Marion County (see figure 2 below).

Woodburn Fire District – Community Emergency Response Team (CERT)

Woodburn has a very active Community Emergency Response Team (CERT) of 40-70 members. Woodburn Fire District funds the CERT Coordinator and office for the chapter; the main fire station serves as a volunteer operations center. WFD CERT is organized under Woodburn Fire District.

WFD CERT provides the Woodburn, Gervais, Hubbard areas and portions of Marion County with an Emergency Operations Plan (EOP) based on a variety of volunteer skills for emergency tactical, administrative, communications and logistics among the Cities and their agencies, and among the Cities and county government (Operational Area). The purpose of the emergency operations plan is to provide authority for the participation of CERT in providing essential services during periods of national, state, or local emergency. The CERT COMTEAM is intended to augment agency and public safety operations. The number of participants is limited only by available, trained resources and will be based on the specific need and the availability of responders. A declaration of an emergency is not required to mobilize the CERT resources, but an activation will require approval from the WFD.

CERT provides many other services, including medical triage and first-aid, light search and rescue, damage assessment, firefighter rehabilitation, crowd control, flood response, spontaneous volunteer management, and other duties that fall within its scope of training and mandate. CERT also engages in community service work: food drives, deliveries, and Cascadia earthquake preparedness education.

17.4.1 Community Characteristics

The city of Woodburn is in the Willamette Valley in Marion County, Oregon, approximately 31 miles south of the city of Portland. Woodburn experiences a moderate climate with an average high temperature of 82 degrees and low of 54 degrees in August, and an average high temperature of 47 and low of 35 in January. The city receives an average annual precipitation of 40.7 inches.⁴ Major bodies of water in Woodburn include Senecal Creek and Mill Creek. Woodburn is located on a flat area, with farmland surrounding the city on all sides.

The Population Research Center at Portland State University lists Woodburn's 2020 population at 25,882. This represents a 24.1% increase from 2000 (Portland State University, Population Research Center, 2021). For more demographic information, refer to Volume III, Appendix B-Community Profile.

17.4.2 Economy

Historically, the city of Woodburn was a commercial, agricultural, and industrial community that grew around the railroad that currently runs through the center of town (City of Woodburn, N.d.). Today, Woodburn's economy is still largely based on manufacturing, agriculture, construction, and retail trade. Woodburn's proximity to I-5 allows for an auto-oriented service economy to exist along the interstate corridor. The Woodburn Premium Outlets are a large shopping attraction for out-of-town visitors. Changes in development include an Amazon distribution center coming in, necessitating city infrastructure improvements like a new fire hydrant system. Similarly, a 2,500 residential unit development has been proposed. If built, this would add 10% more housing to the city of Woodburn. Median household income in Woodburn from 2015 to 2019 was \$50,093, a 7.3% increase from the previous period (U.S. Census Bureau, 2022). For more economic information, refer to Appendix C.

Figure 17-1, City of Woodburn Map

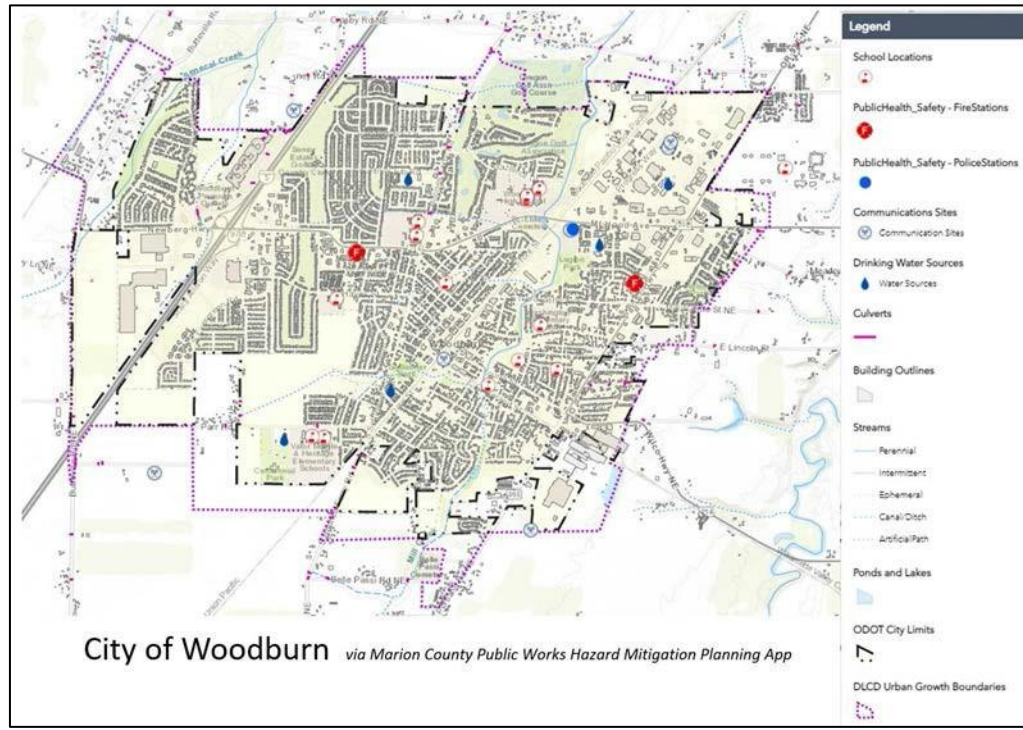
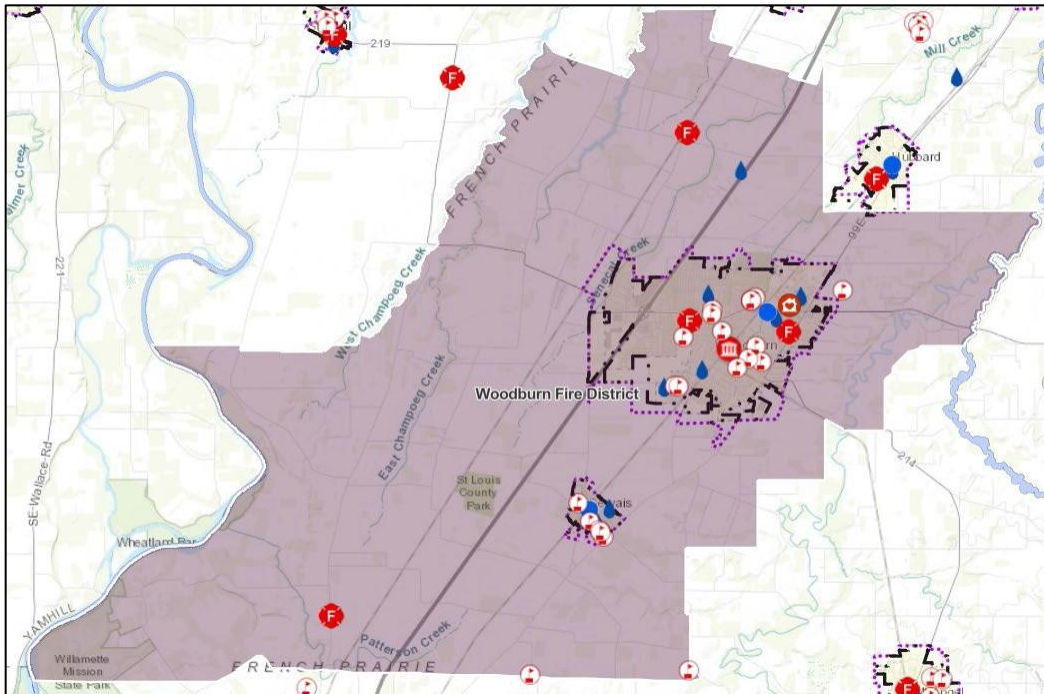


Figure 17-2, Woodburn Fire District



Source Marion County GIS

17.5 Critical and Important Facilities

Woodburn and Woodburn Fire District’s critical and important facilities include the following:

17.5.1 Transportation

- Interstate-5 runs north-south through western Woodburn.
- Highway 99E runs parallel to I-5 through eastern Woodburn.
- Highway 214 runs east-west through Woodburn (Highway 211 also runs east-west and merges with Highway 214 when it reaches Woodburn)
- The Union Pacific Railroad runs parallel to I-5 through the middle of Woodburn.
- The Burlington Northern Santa Fe railroad runs north-south just west of Woodburn.
- Woodburn Transit Service.
- Woodburn Amtrak Station.

17.5.2 Energy

- PGE – electricity (2079 Progress Way)
 - PGE operates a maintenance facility and three sub-stations in or near Woodburn.

17.5.3 Water / Wastewater

Water:

- Above-ground storage tank: 750,000 gallons
- Underground storage reservoir: 4.7 million gallons
- Seven active wells (according to the 2005 Public Facilities Plan)
- Three water treatment plants (National Wy., Country Club Rd., and Parr Rd.)

Wastewater

- Wastewater Treatment Plant and Collection System (located off of Highway 211)
 - Approximately 140 acres of land
 - Ten lift stations for sanitary sewer services

17.5.4 Emergency Services

Police Department:

City of Woodburn, 1060 Mt. Hood Ave., Woodburn, Oregon (503) 982-2345

Fire Department:

Woodburn Fire District, 1776 Newberg Hwy., Woodburn, Oregon (503) 982-2360

Station 22 – 1650 James St., Woodburn, Oregon

Station 24 – 11484 River Rd., Gervais, Oregon 97026

Station 25 – 18676 Butteville Rd., Hubbard, Oregon 97032

Medical:

- BestMed Urgent Care (2902 Tom Tennant Dr.)
- Legacy Health / Woodburn Specialist Center (1475 Mount Hood Ave.)
- Salem Health Clinic (105 N. Arney Rd.)
- Salud Medical Center (1175 Mount Hood Ave.)
- Woodburn Pediatric Clinic (2050 Progress Way)
- Note: Major hospitals are in Silverton and Salem

City Administration: City Hall, Public Works, Finance, Planning, Municipal Court

City of Woodburn, 270 Montgomery St., Woodburn, Oregon (503) 982-5228

17.5.5 Cultural / Historical Resources

- Buildings listed on the National Register of Historic Places:
 - Bank of Woodburn
 - Old Woodburn City Hall
 - Jesse H. Settlemier House
- Woodburn also has an Historic Downtown district.
- Events/amenities that may have large crowds:
 - March and April: Woodburn Tulip Festival
 - Woodburn Premium Outlets (particularly around Black Friday and the holiday season)
 - Fiesta Mexicana in Legion Park
 - Relay for Life in July
 - Drag Racing NHRA (National Hot Rod Association) from March to November
 - Bauman's Fall Festival in Gervais (impacts traffic in Woodburn)
 - Oktober Fest in Mt. Angle (impacts traffic in Woodburn)
 - St. Paul Rodeo (impacts traffic in Woodburn)

17.5.6 Functional and Access Needs (Vulnerable Populations)

- Schools:
 - Heritage Elementary (440 Parr Rd.)
 - Lincoln Elementary (1041 N. Boones Ferry Rd.)
 - Nellie Muir Elementary (1800 W. Hayes St.)
 - Washington Elementary (777 E. Lincoln St.)
 - French Prairie Middle (1025 N. Boones Ferry Rd.)
 - Valor Middle (450 Parr Rd.)
 - Academy of International Studies (1785 N. Front St.) – high school
 - Success Alternative High School (610 Young Street)
 - Wellness, Business and Sports School (1785 N. Front Street) – high school
 - Woodburn Academy of Art, Science and Technology (1785 N. Front St.) – high school
 - Woodburn Arts and Communications Academy (1785 N. Front St.) – high school
 - St. Luke's Parochial School (529 Harrison St.)

- Head start (950 N. Boones Ferry Rd.)
- Oregon Child Development Coalition (OCDC) (540 North Settlemier Avenue)
- – Infant services
- Chemeketa Community College (120 E. Lincoln Street) – community college
- Pacific University Campus (24 W Lincoln St) – college
- Woodburn Arthur Academy (575 Gatch St.) – K- 5th Grade.

See hazard sections below and Section 2, Risk Assessment, for potential hazard vulnerabilities to these facilities.

17.6 Plans and Policies

Table 17-1, Plans and Policies of the City of Woodburn & Woodburn Fire District

Document Name <i>with Hyperlink if the document is available online</i>	Year
Woodburn Comprehensive Plan	2019
Woodburn Comp Plan Map Explorer (link here)	2022
Woodburn Transportation System Plan (TSP webpage)	2019
Woodburn Public Facilities Plan	2005
Woodburn Stormwater Master Plan (chapters 7 and 11)	1996
Woodburn Fire District CERT Emergency Operations Plan	2022

17.7 City of Woodburn Hazard Profile

Community Overview							
Community Name	Population	# Of Buildings	Critical Facilities ¹	Total Building Value (\$)			
Woodburn	25,185	7,332	17	3,446,910,000			
Hazus-MH Analysis Summary							
Hazard	Scenario	Potentially Displaced Residents	% Potentially Displaced Residents	Damaged Buildings	Damaged Critical Facilities	Lost Estimate (\$)	Loss Ratio
Flood ²	1% Annual Chance	41	0.2%	8	0	266,000	0.0%
Earthquake	Mt. Angel Mw 6.8 Deterministic	4,595	18.2%	3,270	4	1,287,042,534	37.3%
Exposure Analysis Summary							
Hazard	Scenario	Potentially Displaced Residents	% Potentially Displaced Residents	Exposed Buildings	Exposed Critical Facilities	Building Value (\$)	Exposure Ratio
Landslide	High and Very High Susceptibility	15	0.1%	5	0	1,224,000	0.0%
Channel Migration	Channel Migration Zone	0	0.0%	0	0	0	0.0%
Wildfire	High and Moderate Risk	87	0.3%	20	0	8,217,418	0.2%
Lahar	Medium Zone (1000 to 15000 – Year)	0	0.0%	0	0	0	0.0%
¹ Facilities with multiple buildings were consolidated into one building complex. ² No damage is estimated for exposed structures with “First floor height” above the level of flooding (base flood elevation).							
Critical Facilities							
Critical Facilities by Community	Flood 1% Annual Chance	Earthquake Moderate to Complete Damage	Landslide High and Very High Susceptibility	Channel Migration Zone	Wildfire High or Moderate Risk	Lahar Hazard	
French Prairie Middle School		X					
Gethsemane Christian Academy		X					
Heritage Elementary School		X					
Legacy Medial Group-Woodburn		X					
Lincoln Elementary School		X					
Nellie Muir Elementary School							
Salud Medical Center							
Silverton-Woodburn Immediate Care and Family Medicine							

Critical Facilities						
Critical Facilities by Community	Flood 1% Annual Chance	Earthquake Moderate to Complete Damage	Landslide High and Very High Susceptibility	Channel Migration Zone	Wildfire High or Moderate Risk	Lahar Hazard
Silverton-Woodburn Internal Medicine						
St. Luke's School						
Valor Middle School						
Woodburn Arthur Academy						
Woodburn Family Medicine						
Woodburn High School						
Woodburn Police Department						
Woodburn Public Works						
Woodburn Fire District #21						
Woodburn Fire District #22						
Woodburn Success High School						

Source: DOGAMI (2022)

17.8 Hazard Analysis

The methodology for assessing risk was the same for all jurisdictions and a detailed description of the BOLD planning methodology can be found in Volume I, a brief description is below. To complete the risk assessment, the jurisdiction representatives first updated the description, type, location, and extent of each hazard. Next, they updated the Hazard Vulnerability Analysis based on each hazard’s potential impact on the community using a calculated priority risk index (CPRI) methodology developed by BOLD Planning⁶. This assessment method ranks the following factors to determine risk from the range of hazards identified:

1. Probability (frequency) of event.
2. Magnitude of event.
3. Expected warning time before event.
4. Expected duration of event.

Score	Probability	Warning Time	Magnitude/Severity	Duration
4	Highly Likely	Less than 6 hours	Catastrophic	More than 1 week
3	Likely	6-12 hours	Critical	Less than 1 week
2	Possible	12-24 hours	Limited	Less than 1 day
1	Unlikely	24+ hours	Negligible	Less than 6 hours

The assessment identifies three levels of risk: High, Moderate and Low.

High - High probability of occurrence; at least 50 percent or more of population at risk from hazard; significant to catastrophic physical impacts to buildings and infrastructure; major loss or potential loss of functionality to all essential facilities (hospital, police, fire, EOC and shelters).

Moderate - Less than 50 percent of population at risk from hazard; moderate physical impacts to buildings and infrastructure; moderate potential for loss of functionality to essential facilities.

Low - Low probability of occurrence or low threat to population; minor physical impacts.

IMPACT	Range Values	
	Low CPRI	High CPRI
High	3.0	4.0
Moderate	2.0	2.9
Low	1.0	1.9

A summary of the risk assessment findings and rankings is presented below.

Table 17-2, Hazard Vulnerability Assessment – Natural Hazards

Hazard Profile Summary for the City of Woodburn/Woodburn Fire District Using Bold Planning Analysis Scoring						
Natural Hazard	Probability	Warning Time	Magnitude	Duration	CPRI	2022 Local Planning Significance
Weight Factor	0.45	0.15	0.3	0.1		
Earthquake	4	4	4	4	4.0	High
Severe Weather/Storm	4	1	3	4	3.3	High
Wildland Interface Fire	3	2	3	4	3.0	High
Drought	3	1	3	4	2.8	Moderate
Flood (including dam failure)	3	1	3	4	2.8	Moderate
Extreme Weather - High Temperature	3	1	3	3	2.7	Moderate
Tornado	1	4	3	3	2.3	Moderate
Avalanche (new in 2021)	1.5	1	2	3	1.7	Low
Volcanic Eruption	1.5	1	2	3	1.7	Low
Landslide	1	4	1	3	1.7	Low

Source: BOLD Planning Risk Assessment Method; Analysis by Marion County Emergency Management, the City of Woodburn, and Woodburn Fire District on 11/23/22 and 1/12/22.

Table 17-3, Hazard Vulnerability Assessment – Other Hazards

Hazard Profile Summary for the City of Woodburn/Woodburn Fire District Using Bold Planning Analysis Scoring						
Other Hazard	Probability	Warning Time	Magnitude	Duration	CPRI	2022 Local Planning Significanc
Weight Factor	0.45	0.15	0.3	0.1		
Hazardous Materials – Non-Transportation	3	4	4	4	3.6	High
Hazardous Materials Release - Transportation	2.5	4	4	4	3.3	High
Terrorism/Active Shooter/Workplace Violence	2.5	4	3	4	3.0	High
Cyberterrorism	3	4	2.5	3	3.0	High
Chemical, Biological, Radiological, Nuclear, Explosive	2	4	3	4	2.8	Moderate
Public Health	3	1	3	4	2.8	Moderate
Agricultural Terrorism	2	2	3	4	2.5	Moderate
Fire - Residential / Commercial (Arson)	2	4	2	3	2.4	Moderate
Unauthorized Entry	2	4	2	3	2.4	Moderate

Source: Marion County Emergency Management the City of Woodburn, and Woodburn Fire District on 11/23/22 and 1/12/22.

17.9 Hazard Characteristics

Hazard History, Characteristics and Extent for Marion County apply also to the City of Woodburn and Woodburn Rural Fire Protection District. Volume I, Section 2, Risk Assessment, adequately describes the characteristics of hazards, as well as the location and extent of potential events. This section identifies vulnerabilities specific to the City of Woodburn and Woodburn Rural Fire Protection District, recent localized hazard events and impacts, and illustrates the basis for the city’s HVA scores.

17.9.1 Avalanche

CPRI = 1.7, Risk Level: Low

Events: Not Reported

Vulnerability: Not Reported

17.9.2 Drought

CPRI = 2.8, Risk Level: Moderate

Events: Governor Kate Brown declared a drought emergency for all of Marion County in September 2015, but according to the steering committee, Woodburn has not implemented water curtailment measures.

Vulnerability: The City’s water supply comes exclusively from subsurface sources, making vulnerability to drought moderate. Due to a cool, wet climate, past and present weather conditions have generally spared Marion County communities from the effects of drought. According to Woodburn’s Public Facilities Plan, the city has seven active wells which pump water through three neighborhood treatment plants. This water is then pumped into two storage facilities – an above ground tank and a larger underground storage reservoir. From here, water is distributed out to residential, commercial, and industrial customers. Woodburn has a Water Management and Conservation Plan, released in January 2010. The Plan contains a “Water Curtailment Element.”

17.9.3 Earthquake

CPRI = 4.0, Risk Level: High

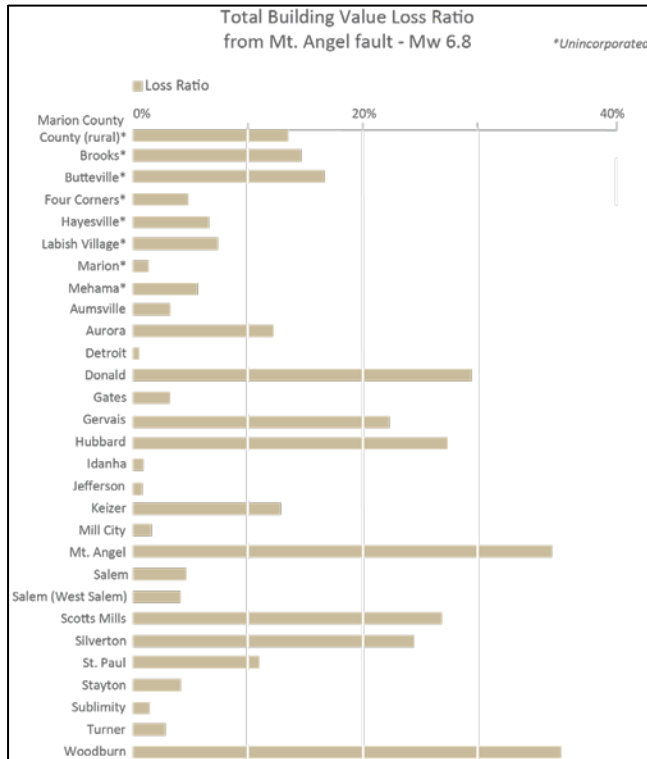
Events: On March 25, 1993, a Mw 5.7 earthquake occurred with an epicenter approximately 3 miles east of the City of Scotts Mills, Oregon. Many buildings were damaged from the event, including the capitol building in Salem. The many unreinforced buildings in the area were significantly damaged due to intense shaking. The preliminary damage estimate was \$28.4 million (\$50 million in 2022) (Black, 1996).

Vulnerability: The Mt. Angel Fault is an active fault located near the Cities of Mt. Angel, Woodburn, and Silverton.

The DOGAMI results indicate that Marion County could incur moderate to significant losses (11%) due to a Mt. Angel fault Mw 6.8 earthquake. These results are strongly influenced by proximity to the Mt. Angel Fault and ground deformation from liquefaction. The communities in the northeast part of the county (Gervais, Hubbard, Mt. Angel, Scotts Mills, Silverton, and Woodburn), close to the Mount Angel Fault all have

higher levels of estimated losses compared the rest of the county. This is consistent with the damage that occurred from the 1993 Scotts Mills earthquake. In addition, high liquefaction susceptibility exists within most of the floodplains throughout the county which increases the risk from earthquake. Areas near the epicenter of the simulated earthquake scenario are likely to incur a significant amount of damage. The communities of Mt. Angel, Scotts Mills, Silverton, and Woodburn have higher estimated loss ratios compared to other communities in the study due to the level of shaking likely to occur.

Figure 17-3, Earthquake Risk to Building Value



Source: DOGAMI (2022)

17.9.4 Severe Weather – Heat

CPRI = 2.7, Risk Level: Moderate

Events: The temperature in the summer of 2021 reach 116 degrees. This extreme heat emergency event resulted in the city developing temperature refuge capability.

Vulnerability: Seniors and low-income families are at risk of extreme heat events. City program work in this area has designated trigger temperatures and locations identified. CERT volunteers support these efforts.

17.9.5 Flood (Includes Dam Failure)

CPRI = 2.8, Risk Level: Moderate

Events: Not Reported

Vulnerability: Portions of Woodburn have areas of flood plains (special flood hazard areas). These include areas along Mill Creek and Senecal Creek (see Figure WB-4). The Pudding River, just to the east of Woodburn, is also a major source of flooding. Historically, Woodburn has experienced major floods in 1986 and 1996 on the Pudding River. Since then, no major floods have affected the population, but Woodburn continues to experience regular localized flooding during the wet season. According to the steering committee, localized flooding occurred in 2013 along several drainages. The steering committee also indicated that Boones Ferry Rd. regularly experiences localized flooding issues.

17.9.6 Landslide

CPRI = 1.7, Risk Level: Low

Events: Not Reported

Vulnerability: Landslide risk in Woodburn is low to moderate in most populated areas, with some small areas of high along Mill and Senecal Creeks.

17.9.7 Severe Weather / Storm

CPRI = 3.3, Risk Level: High

Events: In February 2021, Woodburn experienced a severe winter storm event – a 50-year ice storm. In some areas, power was out for two weeks, as it was the largest outage in the history of PGE. This event initiated closer coordination with local nursing homes by WFD. This event also identified the need for better fuel and water supply coordination.

Significant wind events occur in Woodburn each year, sometimes interrupting services, downing trees, and causing power outages. Since 1957, five reported tornadoes have struck Marion County, however none have touched down near Woodburn. More recently, two windstorms in 2015 toppled trees, with one tree causing damage to a house.

According to the Woodburn steering committee, Woodburn experiences at least one severe wind event each year, often resulting in power outages. During a storm in May 2014, lightning caused an estimated \$75,000 in damage to property, including a house. The most recent winter storms (December 2016 – January 2017) included snow and ice and resulted in transportation and power interruptions combined with government office and school closures.

Vulnerability: Severe winter storms can consist of rain, freezing rain, ice, snow, cold temperatures, and wind. They originate from troughs of low pressure offshore that ride along the jet stream during fall, winter, and early spring months. Severe winter storms affecting Woodburn typically originate in the Gulf of Alaska or in the central Pacific Ocean. These storms are most common from November through March.

Major winter storms can and have occurred in the Woodburn area, and while they typically do not cause significant damage, they are frequent and have the potential to impact economic activity.

17.9.8 Tornado

CPRI = 2.3, Risk Level: Moderate

Events: Since 1957, five reported tornadoes have struck Marion County, however none have touched down near Woodburn.

Vulnerability: According to the Woodburn steering committee, Woodburn experiences at least one severe wind event each year, often resulting in power outages.

17.9.9 Volcanic Eruption

CPRI = 1.7, Risk Level: Low

Events: Previous occurrences are well-documented within the county's plan. When Mt. Saint Helens erupted in 1980, the city was impacted only by ashfall.

Vulnerability: The causes and characteristics of a volcanic event are appropriately described within the county's plan, as well as the location and extent of potential hazards. Woodburn is very unlikely to experience anything more than volcanic ash during a volcanic event.

17.9.10 Wildfire

CPRI = 3.0, Risk Level: High

Events: There is no history of wildfire events occurring within the City of Woodburn and the Woodburn Fire District. However, both jurisdictions provided support to Marion County jurisdictions during the 2020 wildfires.

Vulnerability: Due to Woodburn's isolation from the majority of at-risk areas, Woodburn is unlikely to be affected directly by wildfires. Should they occur nearby, however, the city could be affected by smoke, impacting people with respiratory problems, and potentially the elderly or very young.

17.10 Mitigation Strategy

During the 2022 Marion County Hazard Mitigation Plan Addendum update process, Oregon Department of Land Conservation & Development developed a list of priority actions in a joint meeting with the City of Woodburn and the Woodburn Fire District. The two jurisdictions are both plan holders in this update but are sharing an addendum due to the integrated nature of their local planning efforts that includes the school district, community-based organizations, and a very active CERT team coordinated by Woodburn Fire District.

17.10.1 Mitigation Success

- Woodburn Fire District (WFD) has been working with nursing homes and care facilities (12-15) to ensure these facilities have the proper equipment and supplies in an emergency. WFD coordination includes water, backup power, and fuel—both natural gas and liquid fuel. WFD CERT supports this with canvassing and volunteering.
- WFD applied for a SPIRE grant for refueling. The SPIRE grant will allow WFD to provide fuel to the cities of Gervais, Woodburn, Canby, and Hubbard (and the nursing homes mentioned above) by using a 500-gallon fuel tank on a trailer to refuel.
- WFD CERT has established a HAMM radio link with Marion County Emergency Management in Salem as a redundant emergency communication method.
- The city provides cold and hot weather shelters to address the risk of temperature extremes on community members. CERT volunteers provide support for this. In addition, the city is coordinating with Arches and setting aside \$60k/yr to provide temperature refuge assistance for the houseless population.
- WFD has implemented a community CPR program since 2017 by providing first-aid and CPR classes to members of the public.
- Culvert widening projects for Wyffel Park and Gatch Street between Lincoln St. and Hardcastle Ave. were included in upcoming Capital Improvement Plans (2017-P-1).
- The Stormwater Master Plan was updated to include important flood mitigation projects (2017-P-2).
- Woodburn and Woodburn Fire have ensured that all critical facilities have backup power and emergency operations plans to deal with power outages (2017-MH-7).
- The city computer system, network, and website have been evaluated for the ability to function during an emergency (2017-MH-8).
- The city has completed and maintains an inventory of high-risk buildings, critical facilities, and infrastructure that may be particularly vulnerable to earthquake damage (2017-EQ-2).
- Update the city's Comprehensive Plan to reflect the latest information on seismic hazards (2017-EQ-7).

17.10.2 Ongoing Actions

- Coordination on improving communications is an ongoing action item that includes equipment costs—at a local and countywide scale. The countywide communications equipment upgrade will result in a significant success when implemented in 2024 (2017-P-3 and 2017-P-4).
- WFD use and maintenance of their fueling and water distribution trailers is an ongoing disaster resilience action item.
- Encourage residents to prepare and maintain 2-week survival kits through education, coordination, and training in preparation for a large regional disaster.
- Provide periodic first aid and CPR classes to members of the public.
- Participate in Marion County's post-disaster recovery planning efforts.
- Encourage residents and commercial businesses to purchase earthquake insurance (2017-EQ-8).
- Continue compliance with the National Flood Insurance Program through the enforcement of local floodplain ordinances (2017-FL-3).
- Educate homeowners about choosing ice and windstorm-resistant trees and landscaping practices to reduce tree-related hazards in future ice storms.
- Educate citizens about safe emergency heating equipment and the importance of installing carbon monoxide detectors (WFD).

17.10.3 City of Woodburn and Woodburn Fire District Mitigation Action Table

The table below (Table 17.4) shows the City of Turner mitigation actions.

Table 17-4, City of Woodburn and Woodburn Fire District Mitigation Action Items

City of Woodburn & Woodburn Fire District Priority Mitigation Actions 2022-2027							
#	Hazard	Mitigation Action/Description	Priority	Timeline	Cost	Coordinating Organization	Status
2022-MH-1	Multi-Hazard	Work to streamline the communication systems between all emergency responders. This might include purchasing additional equipment for some units. County-Wide 800 MHz Radio System; Subscriber cost will apply to Woodburn, but County is funding the majority.	H	2-5 Years	\$100k	City of Woodburn Police Department	Ongoing
2022-MH-2	Multi-Hazard	Establish an emergency fuel site at the new Gervais Fire Station, just south of Woodburn. Purpose: Fuel for 10-14 days. In design/ pre- implementation phase in July 2022.	H	1-3 Years	\$25k	Woodburn Fire District	New
2022-MH-3	Multi-Hazard	Establish a storage building for a 500-gallon portable fuel trailer and a 500-gallon portable water trailer in the Gervais area. Fuel trailer will be used to fill generators, fire apparatus and heavy equipment working in the field following a regional disaster. Water trailer will provide emergency potable water in the event of water system interruption.	H	1-3 Years	\$250k	Woodburn Fire District	New
2022-MH-4	Multi-Hazard	Develop and equip emergency shelters to take care of residents and vulnerable populations such as the elderly, the medically fragile, children, people who speak English as a second language, low-income residents, etc. City Council allocated budget, contract with Arches, Inc. for houseless temperature refuge. Partners: CERT, WFD, Red Cross, Marion County, School Districts.	H	0-18 months	\$60,000	Staff Time	Ongoing

#	Hazard	Mitigation Action/Description	Priority	Timeline	Cost	Coordinating Organization	Status
2022-MH-5	Multi-Hazard	Educate the community about the risk of ammonia release; work with Marion Co. to provide a series of trainings for emergency responders about dealing with hazardous materials. 2017-MH-10 revised Cold storage facilities have ammonia on site. Ammonia release risk education is a priority	H	1-3 Years	Staff Time and Training Budget	City of Woodburn and Woodburn Fire District	Started
2022-MH-6	Multi-Hazard	Create agreement to jointly access an emergency fuel site just south of the city; continue discussions to ensure adequate fuel supply in case of disaster. Woodburn vehicles have a lower need for diesel than WFD.	H	1-3 Years	Staff Time	City of Woodburn Police and Woodburn Fire District	New
2022-MH-7	Multi-Hazard	Develop a traffic management plan for redirecting traffic in the event of a major incident that cuts off roads. 2017-MH-9 Partners: Planning, WFD	M	1-3 Years	Staff Time	City of Woodburn Public Works	Not Started
2022-EQ-1	Earthquake	Require new city facilities to exceed the minimum structural requirements for seismic loading. 2017-EQ-1 Revised Partners: Emergency Manager, CERT, WFD	H	2-5 Years	Staff Time & Capital Budget	City of Woodburn Building Inspection & Permitting	Not Started
2022-EQ-2	Earthquake	Install automatic shut-off valves in all city facilities that use natural gas. Was 2017-EQ-9.	H	2-5 Years	Staff Time	Building Official	Started
2022-DR-1	Drought	Partner with Marion County to support local agencies' training on water conservation measures. Was 2017-DT-1 Partner: Environmental Services	M	2-5 Years	Staff Time	City of Woodburn	Not Started
2022-VC-1	Volcanic Eruption	Identify critical facilities and equipment that can be damaged by ashfall and develop mitigation activities to prevent damage to these facilities. Partners: Public Works, Marion County, DOGAMI, USGS	M	2-5 Years	Staff Time	City of Woodburn	Not Started

#	Hazard	Mitigation Action/Description	Priority	Timeline	Cost	Coordinating Organization	Status
2022-SW-1	Severe Weather	Require new city facilities to exceed the minimum structural requirements for wind loading.	M	2-5 Years	Staff Time	City of Woodburn Building Department	Not Started
2017-2022 City of Woodburn and Woodburn Fire District Action Status Updates							
#	Hazard	Mitigation Action/Description	Coordinating Organization		Partnering Organizations		Status
2017-P-1	Flood	Include culvert widening projects for Wyffel Park and Gatch Street between Lincoln St. and Hardcastle Ave. in upcoming Capital Improvement Plans.	City of Woodburn Public Works		Non-Reported		To be completed after item 2017-P-2 is completed
2017-P-2	Flood	Update the Stormwater Master Plan to include important flood mitigation projects.					Completion in 2023
2017-P-3	Multi-Hazard	Improve communication equipment in City Hall and in city vehicles and identify additional radio operators to serve as communication backup in an emergency.	City of Woodburn		City of Woodburn Police, Woodburn Fire District, Marion County Public Works		On-going
2017-P-4	Multi-Hazard	Work to streamline the communication systems between all emergency responders. This might include purchasing additional equipment for some units.	City of Woodburn		City of Woodburn Police, Woodburn Fire District, Marion County Public Works		On-going
2017-MH-1	Multi-Hazard	Develop a voluntary registry of populations that may need assistance in an emergency.			METCOM 911, Adult Family Services, Hospitals		Suspended
2017-MH-2	Multi-Hazard	Provide periodic first aid and CPR classes to members of the public.	City of Woodburn		Woodburn Fire District		Ongoing
2017-MH-3	Multi-Hazard	Participate in Marion County's post-disaster recovery planning efforts.			Marion County		Ongoing
2017-MH-4	Multi-Hazard	Continue development of CERT teams to ease the load on emergency services following a disaster.	Woodburn Fire District		Marion County		Ongoing

#	Hazard	Mitigation Action/Description	Coordinating Organization	Partnering Organizations	Status
2017-MH-5	Multi-Hazard	Develop and equip emergency shelters to take care of residents and vulnerable populations such as the elderly, the medically fragile, children, people who speak English as a second language, low-income residents, etc.	City of Woodburn	CERT, Red Cross, Marion County, School Districts	Ongoing
2017-MH-6	Multi-Hazard	Educate businesses and governmental organizations about the importance of continuity of operations plans to make them more resilient to natural hazards.	City of Woodburn	Marion County, SEDCOR, Chamber of Commerce	Discontinue
2017-MH-7	Multi-Hazard	Ensure that all critical facilities have backup power and emergency operations plans to deal with power outages. WFD is ensuring that care facilities are addressed.	City of Woodburn	Woodburn Fire District	Completed
2017-MH-8	Multi-Hazard	Evaluate the city computer system, network, and website for the ability to function during an emergency.	City of Woodburn	Non-Reported	Completed
2017-MH-9	Multi-Hazard	Develop a traffic management plan for redirecting traffic in the event of a major incident that cuts off roads.	City of Woodburn Public Works	Marion County, Woodburn Fire District	Completed
2017-MH-10	Multi-Hazard	Work with Marion Co. to provide a series of trainings about dealing with hazardous material. Cold storage facilities have ammonia on site. Ammonia release risk education is a priority	City of Woodburn	Marion County, County Fire Defense Board, Woodburn Fire District	Discontinue
2017-DR-1	Drought	Partner with Marion County to support local agencies' training on water conservation measures.	City of Woodburn	Marion County	Not Started
2017-EQ-1	Earthquake	Encourage reduction of nonstructural and structural earthquake hazards in homes, schools, businesses, and government offices through public education.	City of Woodburn	Woodburn Fire District including CERT	Ongoing

#	Hazard	Mitigation Action/Description	Coordinating Organization	Partnering Organizations	Status
2017-EQ-2	Earthquake	Complete and maintain an inventory of high-risk buildings, critical facilities, and infrastructure that may be particularly vulnerable to earthquake damage.	City of Woodburn	Marion County	Completed
2017-EQ-3	Earthquake	Send city employees to the County's ATC 20 training.	City of Woodburn Building and Engineering	Non-Reported	Not Started
2017-EQ-4	Earthquake	Evaluate the structural integrity of city-owned buildings.	City of Woodburn Building and Engineering	Non-Reported	Not Started
2017-EQ-5	Earthquake	Require new city facilities to exceed the minimum structural requirements for seismic loading. Current code; Pending construction of new buildings	City of Woodburn Building Inspection	City Council	Not Started
2017-EQ-6	Earthquake	Seek funding to further assess the "probability of collapse" for Lincoln Elementary School, Washington Elementary School, French Prairie Middle School, Nellie Muir Elementary School, and Woodburn High School. Outside of City/WFD authority.	Woodburn School District	City of Woodburn	Discontinue
2017-EQ-7	Earthquake	Update the city's Comprehensive Plan to reflect the latest information on seismic hazards	City of Woodburn Planning	Non-Reported	Not Started
2017-EQ-8	Earthquake	Encourage residents and commercial businesses to purchase earthquake insurance.	City of Woodburn Building and Engineering	City's PIO	Ongoing
2017-EQ-9	Earthquake	Install automatic shut-off valves in all city facilities that use natural gas.	City of Woodburn Building	City Council	Not Started
2017-EQ-10	Earthquake	Encourage residents to prepare and maintain 2-week survival kits.	City of Woodburn	Woodburn Fire District, CERT, Marion County	Ongoing
2017-FL-1	Flood	Implement mitigation action items in the Public Facilities Plan.	City of Woodburn Public Works	Non-Reported	Complete

#	Hazard	Mitigation Action/Description	Coordinating Organization	Partnering Organizations	Status
2017-FL-2	Flood	Partner with Marion County to conduct workshops for target audiences on National Flood Insurance Programs, mitigation activities, and potential assistance from FEMA's Flood Mitigation Assistance and Hazard Mitigation Grant Programs. The city ensures NFIP compliance and updated maps via their floodplain manager.	City of Woodburn	Marion County Public Works; DLCD NFIP Coordinator; FEMA	Not Started
2017-FL-3	Flood	Continue compliance with the National Flood Insurance Program through the enforcement of local floodplain ordinances.	City of Woodburn	Marion County Public Works; DLCD NFIP Coordinator; FEMA	Ongoing
2017-FL-4	Flood	Update the City's Flood Insurance Rate Maps (FIRMs) - FEMA should be releasing updates soon.	City of Woodburn	FEMA	Discontinue
2017-VC-1	Volcanic Eruption	Identify critical facilities and equipment that can be damaged by ashfall and develop mitigation activities to prevent damage to these facilities.	City of Woodburn	PIO, CERT	Ongoing
2017-SW-1	Severe Weather	Educate the public about the benefits of proper tree pruning and care in preventing damage during windstorms. Outreach outlets include Arbor Day and passing out tree maintenance brochures.	City of Woodburn	PIO, CERT	Ongoing
2017-SW-2	Severe Weather	Educate the community about the risk of downed power lines, aerial power lines in the vicinity of trees, and preparedness measures to take in the event of a power outage.	City of Woodburn	PGE, CERT	Ongoing
2017-SW-3	Severe Weather	Require new city facilities to exceed the minimum structural requirements for wind loading.	City of Woodburn Building Department	Non-Reported	Not Started

#	Hazard	Mitigation Action/Description	Coordinating Organization	Partnering Organizations	Status
2017-SW-4	Severe Weather	Educate homeowners about choosing ice and windstorm- resistant trees and landscaping practices to reduce tree-related hazards in future ice storms.	City of Woodburn	PIO, CERT	Ongoing
2017-SW-5	Severe Weather	Educate citizens about ways to weatherize their homes, as well as safe emergency heating equipment. WFD began educating about safe heating equipment during 2021 event; installed CO detectors during and after event.	City of Woodburn	Marion County, Woodburn Fire District, CERT, PGE	Ongoing

Source: Woodburn, Woodburn Fire District, and DLCD, July 13, 2022

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