

# City of Falls City Addendum to the Polk County NHMP



*Photos courtesy of City of Falls City*

**Effective: March XX, 2024 through March XX, 2029**

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# Introduction

## Purpose

This is an update to the Falls City addendum to the Polk County Multi-Jurisdictional Natural Hazard Mitigation Plan (MNHMP, NHMP). This addendum supplements information contained in Volume I (Basic Plan), which serves as the NHMP foundation, and Volume II (Appendices), which provide additional information. This addendum meets the following requirements:

- Multi-Jurisdictional **Plan Adoption** §201.6(c)(5),
- Multi-Jurisdictional **Participation** §201.6(a)(3),
- Multi-Jurisdictional **Mitigation Strategy** §201.6(c)(3)(iv) and
- Multi-Jurisdictional **Risk Assessment** §201.6(c)(2)(iii).

Updates to Falls City's addendum are further discussed throughout the NHMP and within Volume II, Appendix B, which provides an overview of alterations to the document that took place during the update process.

Falls City adopted their addendum to the Polk County Multi-jurisdictional NHMP on [date], 2024. FEMA Region X approved the Polk County NHMP on [date], 2024 and the City's addendum on [date], 2024. With approval of this NHMP, the City is now eligible for non-disaster and disaster mitigation project grants through [date-1], 2029.

## NHMP Process, Participation, and Adoption

This section of the NHMP addendum addresses 44 CFR 201.6(c)(5), *Plan Adoption* and 44 CFR 201.6(a)(3), *Participation*.

In addition to establishing a comprehensive, city-level mitigation strategy, the Disaster Mitigation Act of 2000 (DMA2K) and the regulations contained in Title 44 CFR Part 201 require that jurisdictions maintain an approved NHMP to receive federal funds for mitigation projects. Local adoption and federal approval of this NHMP ensures that the city will remain eligible for non-disaster and disaster mitigation project grants. Falls City was included as an addendum in the 2017 Polk County NHMP update process.

The Oregon Partnership for Disaster Resilience (OPDR) at the University of Oregon's Institute for Policy Research and Engagement (IPRE) partnered with the Oregon Department of Emergency Management (OEM), Polk County, and Falls City to update and incorporate Falls City's NHMP as an addendum to the County's NHMP. This project is funded through the Federal Emergency Management Agency's (FEMA) Hazard Mitigation Competitive Grant Program. Members of the Falls City NHMP steering committee also participated in the County NHMP update process (Volume II, Appendix B).

By creating a NHMP, locally adopting it, and having it approved by FEMA, Falls City will maintain eligibility for FEMA Hazard Mitigation Assistance grant program funds.

The Polk County NHMP and Falls City addendum are the result of a collaborative effort between residents, public agencies, non-profit organizations, the private sector, and regional organizations. A project steering committee guided the process of developing the NHMP.

## Convener and Committee

The City Manager of Falls City served as the designated convener of the NHMP update and will take the lead in implementing, maintaining, and updating the addendum to the Polk County NHMP in collaboration with the designated convener of the Polk County NHMP (Emergency Manager).

Representatives from the City of Falls City steering committee met formally and informally, to discuss updates to their addendum (Attachment B). The steering committee reviewed and revised the City's NHMP, with particular focus on the risk assessment and mitigation strategy (action items).

This addendum reflects decisions made at the designated meetings and during subsequent work and communication with Polk County Emergency Management and the OPDR. The changes are highlighted with more detail throughout this document and within Volume III, Appendix B. Other documented changes include a revision of the City's risk assessment and hazard identification sections, NHMP mission and goals, action items, and community profile.

The Falls City Steering Committee was comprised of the following representatives:

- AJ Foscoli, City Manager
- Jon Creekmore, Public Works Superintendent

The HMAC served as the local review body for the NHMP update.

Stakeholders were included in the planning process. Unlike the Steering Committee, stakeholders for the update were not included in all stages of the planning process, but their input was included to inform the Steering Committee and provide additional perspectives from the community.

The residents of Polk County were given opportunities to participate in and learn about the NHMP planning process throughout the duration of the project. Responses to an online/in person survey were used to draft action recommendations that address the needs of vulnerable populations.

## NHMP Implementation and Maintenance

The City Council will be responsible for adopting the Falls City addendum to the Polk County NHMP. This addendum designates a steering committee and a convener to oversee the development and implementation of action items. Because the City addendum is part of the County's multi-jurisdictional NHMP, the City will look for opportunities to partner with the County. The City's steering committee will convene after re-adoption of the Falls City NHMP addendum on an annual schedule. The County is meeting on a semi-annual basis and will provide opportunities for the cities to report on NHMP implementation and maintenance during their meetings. The City's Economic and Community Development Director will serve as the convener and will be responsible for assembling the steering committee.

The steering committee will be responsible for:

- Reviewing existing action items to determine suitability of funding;
- Reviewing existing and new risk assessment data to identify issues that may not have been identified at NHMP creation;
- Educating and training new steering committee members on the NHMP and mitigation actions in general;
- Assisting in the development of funding proposals for priority action items;

- Discussing methods for continued public involvement;
- Evaluating effectiveness of the NHMP at achieving its purpose and goals (use Table 4-1, Volume I, Section 4, as one tool to help measure effectiveness); and
- Documenting successes and lessons learned during the year.

The convener will also remain active in the County’s implementation and maintenance process (Volume I, Section 4).

The steering committee will be responsible for activities outlined in Volume I, Section 4.

The jurisdiction will utilize the same implementation and maintenance process identified in Volume I, Section 4. The jurisdiction will provide continued public participation during the plan maintenance process through periodic presentations to elected officials, public meetings, postings on social media, and/or through interactive content on the jurisdiction’s website.

The City will utilize the same action item prioritization process as the County (Volume I, Section 4 and Volume II, Appendix D).

## Implementation through Existing Programs

The mitigation actions described herein are intended to be implemented through existing plans and programs within the city. Plans and policies already in existence have support from residents, businesses, and policy makers. Where possible, Falls City will implement the NHMP’s recommended actions through existing plans and policies. Many land-use, comprehensive, and strategic plans get updated regularly, allowing them to adapt to changing conditions and needs. Implementing the NHMP’s action items through such plans and policies increases their likelihood of being supported and implemented.

### Existing Authorities

Hazard mitigation can be executed at a local scale through three (3) methods: integrating hazard mitigation actions into other local planning documents (i.e., plan integration), adopting building codes that account for best practices in structural hardening, and codifying land use regulations and zoning designations that prescribe mitigation into development requirements. The extent to which a municipality or multi-jurisdictional effort leverages these approaches is an indicator of that community’s capabilities.

The following provides a brief synopsis of some of the more important coordinating plans and policies of Falls City in the integration of hazard mitigation and long-range planning:

#### **City of Falls City Comprehensive Plan**

Oregon’s Statewide Planning Goal 7 requires comprehensive planning within every jurisdiction that is designed to reduce risks to people and property from natural hazards. Falls City addresses Statewide Planning Goal 7 Natural Hazards as part of their Comprehensive Plan.

The City of Falls City Comprehensive Plan was originally adopted in May 1979, updated comprehensively in 2001 and 2010, and last amended in July 2013. This plan includes an Element (Chapter) on Areas Subject to Natural Disasters and Hazards, in compliance with Oregon Statewide Planning Goal 7. It details earthquake hazards, flooding, high groundwater table, weak foundation soils, erosion, landslide hazards, and wildfire. The Wildfire section includes additional requirements for dwellings located on land within the City’s Forestry Zones, including flame retardant roofs, egress, domestic water supply, and defensible space.

The Comprehensive Plan Natural Disasters Policies are designed to develop and integrate a hazard mitigation plan for Natural Hazards in Falls City AND reduce earthquake damages in Falls City. Included are policies requiring: additional geotechnical investigations and hazard mitigation measures in Building Limitations areas or on slopes in excess of 25 percent; higher building standards for new schools, fire stations, and medical facilities; and support for earthquake preparedness and hazard mitigation planning led by other governmental agencies.

Land use regulations will be coordinated and are intended to be consistent with federal and state environmental regulations.

The City shall ensure against flood damage to persons and property through the effective implementation of flood plain regulations, consistent with Federal Emergency Management Act (FEMA) standards.

Planned updates to the jurisdiction's Goal 7 element or its broader comprehensive plan will reflect the data and findings within this NHMP and integrate analyses of future climate and natural hazard impacts into the community's long-range plans.

### **Land Use Regulations**

Existing land use policies that define zoning and address hazardous conditions provide another source of mitigation capability.

#### *Falls City Zoning and Development Code*

The Zoning and Development Ordinance is designed to ensure that lots are a proper size and width, there is proper sewage disposal and available water, and that provision has been made for adequate levels of the necessary public services. It was last updated in 2017.

It includes Section 2.205, Standards for areas with Building Limitations, which are designed to minimize public and private losses due to natural hazards resulting from geologic, soils, topographic and/or flood conditions. Areas included on the Building Limitations map include sites with soils determined to: (1) have "severe" building site development issues in the Soil Survey of Polk County due to: Steep slopes; landslide hazard; poor drainage; erosion hazard; low stability; high water table; and/or high shrink-swell potential; (2) slopes equal to or in excess of 25 percent; proximity to perennial or intermittent streams; or "Areas of Special Flood Hazards," per the Flood Insurance Study of December 19, 2006. Their flood prevention code section includes provisions addressing substantial improvement/substantial damage.

Section 2.206 includes general standards for runoff, sedimentation, and erosion control, designed to mitigate flood hazards and maintain water quality.

#### *Public Works Design Standards*

Falls City Public Works Design Standards provide design guidance criteria to the private sector for the design of public and private streets within the City.

### **Structural Building Codes**

The Oregon Legislature recently adopted updated building codes for both residential (2023 Oregon Residential Specialty Code) and commercial structures (Building Codes and Standards: Oregon Structural Specialty Code 2022) since the last update of this Plan. These building codes are based on the 2021 version of the International Building Code, International Fire Code, and International Existing Building Code.

The City of Falls City contracts with Polk County Building Department to administer and enforce adopts the most recent edition of the 2022 Oregon Structural Specialty Code and the 2022 Oregon Fire Code within Falls City. Both new residential and commercial structures are required to build according to the latest seismic and wind hardening standards in addition to requiring fire resistant building materials for those structures constructed in proximity or within the WUI.

### **City Administration**

The City Council of Falls City has the responsibility of developing and adopting the annual city budget. Integrating hazard mitigation goals and projects into the annual budget is key to implementing the plan. The City Council tries to broadly address resilience planning needs while it determines city and departmental priorities and looks for multiple-impact projects wherever possible. They also work with staff to apply for federal and state grant funding to pursue larger projects that are outside of general fund capacity.

The following goals were adopted and given highest priority by the City of Falls City Council in 2022:

1. Upgrade Sewer Infrastructure
2. Implement City Code Services & Implement Beautification
3. Develop Falls City as a Destination & Gateway to Nature
4. Miscellaneous:
  - a. Establish & Implement System Development Charges
  - b. Council Training for All Council
  - c. Housing Strategies
  - d. Capital Improvement Plan
  - e. Parks Development
  - f. Road Maintenance and Repair

### **Policies and Programs**

This Plan directs Falls City and Polk County to explore integration into other planning documents and processes. Falls City has made significant progress in integrating the NHMP into its portfolio of planning processes and programs over the last five years.

The City provides a range of services, including fire protection, construction and maintenance of streets, parks, cemeteries and utility infrastructure, recreational activities and cultural events, short and long range planning and development review, and building permits. Certain services are provided by or in cooperation with regional organizations.

The City owns its water and sanitary sewer utilities, relying on surface water to supply distribution. Electricity, telephone and internet services, and trash disposal are provided by private businesses.

### **Economic Resilience Plan, 2019**

The Falls City Economic Resilience Plan was a community-centered plan designed to identify paths to increase the economic resilience of Falls City. Economic resilience is defined as the ability of an economy (city, county, region, etc.) to recover to a state of normalcy after an economic shock.

### **Falls City Thrives**

From the economic resilience project has come Falls City Thrive. Thrives' mission is to empower the community of Falls City to live with dignity by working to address issues of housing, downtown revitalization, volunteerism, and personal health faced by the Falls City community.



## **Total Maximum Daily Load Implementation Plan, August 2022**

This TMDL Implementation plan represents a response to the 2019 Final Revised Willamette Basin Mercury TMDL and Water Quality Management Plan. The changes to the program were designed to 1) reduce redundancy, 2) include BMPs that are designed to address the pollutants of concern in a useful way, and 3) create BMPs that can be more easily implemented by staff. Tasks identified in the 2022 plan include developing public education and outreach tools (website, online) regarding riparian zone conservation/restoration and water quality, completing a stormwater master plan, updating the City's GIS system to include stormwater data, and adopting an Erosion Control ordinance.

## **Monthly Newsletter**

The Monthly City Newsletter, which is now available online, is used to implement public education components of the NHMP and TMDL Plan. It frequently contains topics on stream bank shading, stormwater awareness, defensible space, winter weather readiness, street sweeping, riparian zone conservation, etc.

## **Community Wildfire Protection Plan**

The Polk County Community Wildfire Protection Plan (CWPP) will be incorporated into this Plan as a functioning annex. The NHMP will also be integrated into the City's Capital Improvement Plan, to be adopted by March 2024.

## **National Flood Insurance Program**

Falls City participates in the National Flood Insurance Program. The City Manager is responsible for administering the day-to-day activities of the city's floodplain program with the assistance of the Polk County Building Department and by contracted planning services. Falls City has a \$5million flood insurance policy with CIS Flood Insurance.

Specifically, the floodplain manager:

- maintains and administers Falls City's floodplain regulations;
- reviews and issues floodplain development permits;
- maintains elevation certificates for all new and substantially improved structures (and maintains an extensive database of historic elevation certificates);
- ensures that encroachments do not occur within the regulated floodway;
- implements measures to ensure that new and substantially improved structures are protected from flood losses;
- maintains floodplain studies and maps and makes this information available to the public;
- maintains a flood information website with digital flood insurance rate map (DFIRM) data;
- conducts site visits to assess conditions and provide technical assistance to the public;
- maintains a library of historical flood related information;
- informs the public of flood insurance requirements; and
- conducts outreach and training about flood hazards and development within the floodplain.

## **Personnel**

The following Falls City personnel have assignments related to natural hazard mitigation planning and implementation:

**Emergency Management:** AJ Foscoli, City Manager

**Public Information Officer:** Jeremy Teal, City Recorder

**Floodplain Manager:** Jon Creekmore, Public Works Superintendent

**Grant writing (for Public Works or emergency management):** AJ Foscoli, City Manager

**Capital improvement planning:** AJ Foscoli, City Manager, Jon Creekmore, Public Works Superintendent

**Capital improvement execution:** Jon Creekmore, Public Works Superintendent

Falls City does not have any employees solely designated to Emergency Management or Mitigation. Staffing levels are extremely limited in number. These personnel integrate hazards and resilience planning into their greater work programs to the best of their abilities. However, there is limited capacity to expand upon their capabilities or workloads.

## Capital Projects

Falls City has implemented recommendations from the last NHMP into its capital improvement projects over the last 5 years, including:

- Funding received through Community Development Block Grants for wastewater treatment plan project (engineering and design)
- \$150k in ODOT Small City Allotment Grant funds on street improvements in FY19
- \$100k in ODOT Small City Allotment Grant funds on street improvements in FY20
- Parry Road water mainline replacement in-work
- Bridge Placement at Dutch Creek Culvert on Mitchell Street (FEMA grant, 2020)

The Falls City Fire Department was awarded a \$98,000 FEMA grant in 2020 to purchase self-contained breathing apparatus, and \$9,800 Weyerhaeuser grant to build out the new brush rig. The City also received a \$3,000 grant from the Pacific Power Foundation to help with the Community Center and Fire Station climate control.

The Falls City High School is getting ready to start a seismic retrofit on their gymnasium (2024-2025).

## Capital Resources

Falls City maintains several capital resources that have important roles to play in the implementation of the natural hazard mitigation plan, including:

**Critical facilities with power generators for use during emergency blackouts:** Community Center/Firehall

**Warming or cooling shelters:** Community Center

**Food pantries:** Seventh Day Adventist Church

## Findings

Several important findings from this capability assessment informed the design of the Plan's mitigation strategy and aided in prioritizing action items.

### Staffing Limitations and Capacity

Falls City staff are assigned hazard mitigation responsibilities as a (small) part of their larger job responsibilities. Limited capacity reduces the breadth of the programming the community can undertake in any year. The city relies upon its relationships with the County and other cities within its region to expand its operations.

### **Reliance upon outside funding streams and local match requirements**

Falls City operates on a limited budget with a small staff. This leaves few opportunities for using local financial resources to implement hazard mitigation work. They lean heavily upon state and federal grant funds as the primary means for securing mitigation funding. Hazard mitigation grants such as HMGP and BRIC require 10-25% local funding match, as well as extra staff capacity and expertise to navigate the application process and manage the funding.

### **Leveraging Partnerships with Public and Nonprofit Entities**

Regional planning displayed in the development of the Community Wildfire Protection Plan demonstrates the City's ability to effectively share information, identify priority needs, and work towards solutions.

## **Mitigation Plan Mission**

The 2023 Falls City HMAC reviewed the previous NHMP Mission and Goals in comparison to the County and State NHMP Goals and determined that they remain relevant and agreed to retain them without modifications.

The NHMP mission states the purpose and defines the primary functions of NHMP. It is intended to be adaptable to any future changes made to the NHMP and need not change unless the community's environment or priorities change.

The mission of the NHMP is to:

**To assist in reducing risk, preventing loss, and protecting life, property, and the environment from future natural hazard events. The plan fosters collaboration and coordinated partnerships among public and private partners. This can be achieved by increasing public awareness and education and identifying activities to guide the county towards building a safer community.**

This can be achieved by increasing public awareness, documenting the resources for risk reduction and loss-prevention, and identifying activities to guide the county and its cities towards building a safer, more sustainable community.

## **Mitigation Plan Goals**

Mitigation plan goals are more specific statements of direction that Polk County citizens, and public and private partners, can take while working to reduce the county's risk from natural hazards. These statements of direction form a bridge between the broad mission statement and particular action items. The goals listed here serve as checkpoints as agencies and organizations begin implementing mitigation action items.

Meetings with the HMAC, previous hazard event reports, and the previous NHMPs served as methods to obtain input and identify priorities in developing goals for reducing risk and preventing loss from natural hazards.

All the plan goals are important and are listed below in no particular order of priority. Establishing community priorities within action items neither negates nor eliminates any goals, but it establishes which action items to consider implementing first, should funding become available.

#### **GOAL 1: PUBLIC EDUCATION AND AWARENESS**

Provide public information and education/awareness to all residents of the county concerning natural hazard areas and mitigation efforts.

#### **GOAL 2: PREVENTIVE AND IMPLEMENTATION**

Develop and implement activities to protect human life, commerce, property and natural systems.

#### **GOAL 3: COLLABORATION AND COORDINATION**

Strengthen hazard mitigation by increasing collaboration and coordination among citizens, public agencies, non-profit organizations, businesses, and industry.

#### **GOAL 4: FUNDING AND PARTNERSHIPS**

Seek partnerships in funding and resources for future mitigation efforts.

#### **GOAL 5: EMERGENCY OPERATIONS**

Coordinate and integrate natural hazard mitigation activities, where appropriate, with emergency operations plans and procedures.

#### **GOAL 6: NATURAL RESOURCES UTILIZATION**

Link land use planning, development criteria, codes, and natural resources and watershed planning with natural hazard mitigation.

## **Mitigation Strategy**

This section of the NHMP addendum addresses 44 CFR 201.6(c)(3)(iv), *Mitigation Strategy*.

The City's mitigation strategy (action items) was first developed during the 2017 NHMP planning process and revised during subsequent NHMP updates. During these processes, the HMAAC assessed the City's risk, identified potential issues, and developed a mitigation strategy (action items).

During the 2023 update process, the City re-evaluated their mitigation strategy (action items). During this process action items were updated, noting if the action is complete, not complete and whether the actions were still relevant; any new action items were identified at this time (see Attachment B for more information on changes to action items).

## Mitigation Successes

The City of Falls City has several examples of hazard mitigation including the following projects funded through FEMA Hazard Mitigation Assistance and the Oregon Infrastructure Finance Authority's Seismic Rehabilitation Grant Program.<sup>1</sup>

### FEMA Funded Mitigation Successes

- Falls City Fire Department self-contained breathing apparatus purchase (\$98,000)

### Seismic Rehabilitation Grant Program Mitigation Successes

- High School gymnasium (planned retrofit, 2024-2025)

### Other Recent Mitigation Successes

- Funding received through Community Development Block Grants for wastewater treatment plan project (engineering and design)
- \$150k in ODOT Small City Allotment Grant funds on street improvements in FY19
- \$100k in ODOT Small City Allotment Grant funds on street improvements in FY20
- Parry Road water mainline replacement in-work
- Bridge Placement at Dutch Creek Culvert on Mitchell Street (FEMA grant, 2020)

## Actions Items

Table FC-1 Action Items documents the title of each action along with the lead organization, partners, timeline, cost, and potential funding resources. The HMAc decided to modify the prioritization of action items in this update to reflect current conditions (risk assessment), needs, and capacity. High priority actions are shown with orange highlight. The City will focus their attention, and resource availability, upon these achievable, high leverage, activities over the next five years. Although this methodology provides a guide for the HMAc in terms of implementation, the HMAc has the option to implement any of the action items at any time. This option to consider all action items for implementation allows the committee to consider mitigation strategies as new opportunities arise, such as capitalizing on funding sources that could pertain to an action item that is not currently listed as the highest priority. Refer to Attachment A for changes to actions since the previous NHMP.

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<sup>1</sup> The Seismic Rehabilitation Grant Program (SRGP) is a state of Oregon competitive grant program that provides funding for the seismic rehabilitation of critical public buildings, particularly public schools, and emergency services facilities.

**Table FC-1 Action Items**

		Impacted Hazard									Implementation and Maintenance			
Action Item #	Statement	Drought	Earthquake	Extreme	Flood	Landslide	Volcanic	Wildfire	Windstorm	Winter	Lead	Timeline	Potential Funding Source	Estimated Cost
1	Purchase and install generators with main power distribution disconnect switches for identified and prioritized critical facilities (particularly schools) susceptible to short term power disruption.	X	X				X	X	X	X	Falls City School District	Medium	HMGP, School District Bond	High
2	Update Building Limitations Map and update Zoning and Development Code if required.		X		X	X					MWVCOG	Long	Local Resources. DLCDD TA, FEMA HMA	High
3	Complete critical facility data collection to allow a more thorough vulnerability analysis for the City's infrastructure.	X	X	X	X	X	X	X	X	X	City Manager	Medium	Local Resources. DLCDD TA, FEMA HMA	Low
4	Disseminate FEMA pamphlets to educate and encourage homeowners concerning seismic structural and non-structural retrofit benefits.				X						City Manager	Ongoing	General Fund, NEHRP, HMGP	Low
5	Repair Dayton Street Bridge		X		X						City Manager	Medium	OR-IFA, USDA, OPRD	High

6	Identify high seismic hazard areas; develop a wood- frame residential building inventory and an outreach program to educate population concerning facilities particularly vulnerable to earthquake damage, such as pre-1940s homes and homes with cripple wall foundations.	X	X						X				MWVCOG	Medium	General Fund	Medium
7	Retrofit Bridge Street Vehicular Bridge		X										City Manager, Public Works	Long	OR-IFA, USDA, OPRD	High
8	Retrofit important public facilities with significant seismic vulnerabilities (City Hall, etc.), such as unreinforced masonry construction. Consider structural and non-structural options.		X										City Manager Falls City School District	Long	General Fund, NEHRP, HMGP, SRGP	High
9	Develop an outreach program to educate public concerning NFIP participation benefits, floodplain development, land use regulation, and NFIP flood insurance availability to facilitate continued compliance with the NFIP.				X								MWVCOG Planning, City Manager, & Public Works	Short	General Fund	Low
10	Southside drainage improvements.				X								City Manager, Polk County, Public Works	Ongoing	Street Fund, HMGP, HMA	High
11	Develop outreach program to educate residents concerning flood proofed well and sewer/septic installation.				X								Sewer: MWVCOG and City Manager Septic: Polk County	Ongoing	General Fund	Low

12	Evaluate and implement preferred erosion protection initiatives to prevent or reduce riverine erosion damages to residential structures and road drainage systems.																	MWVCOG Planning, City Manager, & Public Works	Ongoing	General Fund, NRCS, HMGP, HMA	Medium
13	Identify buildings that are at risk of being affected by erosion.																	MWVCOG Planning, City Manager, & Public Works	Long	General Fund, NRCS, HMPG, HMA	Low
14	Conduct a water intake siting study and environmental impact study.	X																City Manager, Public Works	Long	CDBG, USDA, OR-IFA	High (est. \$1.5 million)
15	Develop, implement, and enforce property development landslide risk assessment procedures to identify potential facility vulnerability.																	MWVCOG Planning & City Manager	Ongoing	General Fund	Low
16	Create the storm water management plan to include regulations to control runoff, both for flood reduction and to minimize saturated soils on steep slopes that can cause landslides.																	MWVCOG Planning & City Manager	Long	General Fund	Low
17	Update emergency response planning and develop client focused outreach program for ash fall events affecting river, air, and highway transportation, and industrial facilities and operations.																	MWVCOG, City Manager	Long	General Fund, NOAA/ NWS	Low



18	Evaluate capability of water treatment plant to deal with high turbidity from ash falls, update emergency response plans, and upgrade treatment facilities' physical plant to deal with ash falls.									X					City Engineer, City Manager & Public Works	Long	General Fund, NOAA/ NWS	Medium
19	Develop outreach program to educate and encourage home landscape cleanup (defensible space) and define debris disposal programs.									X	X	X			DEQ, City Manager	Ongoing	General Fund, ODF, FMAP, HMGP	Low
20	Participate in the maintenance, implementation, and update of the Polk County Community Wildfire Protection Plan (2009).									X					PC SW Rural Fire District Polk County & City Manager	Ongoing	General Fund	Low
21	Identify, develop, implement, and enforce mitigation actions such as fuel breaks and reduction zones for potential wildland fire hazard areas.									X					Polk County, Oregon Department of Forestry, City Manager	Ongoing	General Fund	High
22	Identify critical facilities and vulnerable populations based on mapped high hazard areas.	X	X	X	X	X	X	X	X	X	X				City Manager	Medium	General Fund, HMA	Low
23	Install new fire hydrants in locations where there is insufficient coverage as identified in Master Water Plan.									X					City Manager & Public Works	Medium	Water Fund, HMGP, PDM	High

24	Identify and prioritize critical facilities' overhead utilities that could be placed underground to reduce power disruption from windstorm / tree blow down damage.									X	X	X	City Manager & Pacific Power & Light	Medium	General Fund, HMGP, HMA, Utility Co.	High
25	Develop and implement programs to coordinate maintenance and mitigation activities to reduce risk to public infrastructure from severe winter storms.										X	X	Public Works	Ongoing	General Fund	Medium
26	Develop and implement strategies and educational outreach programs for debris management from severe winter storms.									X	X		MWVCOG Planning & City Manager & Public Works	Medium	General Fund, PA	Low

Source: Falls City HMGP, 2023. Cost: L – Low (less than \$50,000), M - Medium (\$50,000-\$150,000), H - High (more than \$150,000)

Timing: O-Ongoing (continuous), S-Short (1-2 years), M-Medium (3-5 years), L-Long (5 or more years)

Priority Actions: Identified with **bold** text and **orange** highlight

# Risk Assessment

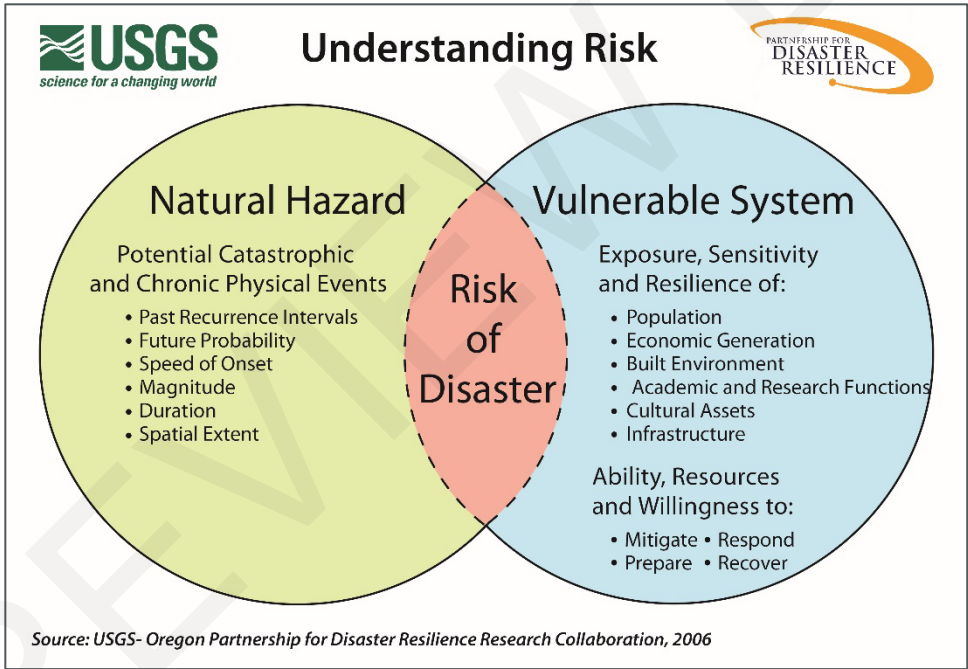
This section of the NHMP addendum addresses 44 CFR 201.6(b)(2) - Risk Assessment. In addition, this chapter can serve as the factual basis for addressing Oregon Statewide Planning Goal 7 – Areas Subject to Natural Hazards.

Assessing natural hazard risk has three phases:

- **Phase 1:** Identify hazards that can impact the jurisdiction. This includes an evaluation of potential hazard impacts – type, location, extent, etc.
- **Phase 2:** Identify important community assets and system vulnerabilities. Example vulnerabilities include people, businesses, homes, roads, historic places, and drinking water sources.
- **Phase 3:** Evaluate the extent to which the identified hazards overlap with, or have an impact on, the important assets identified by the community.

The local level rationale for the identified mitigation strategies (action items) is presented herein and within Volume I, Sections 2 and 3. The risk assessment process is graphically depicted in Figure FC-1 below. Ultimately, the goal of hazard mitigation is to reduce the area of risk, where hazards overlap vulnerable systems.

**Figure FC-1 Understanding Risk**



# Hazard Analysis

The Falls City steering committee developed their hazard vulnerability assessment (HVA), using the County’s HVA (Volume II, Appendix C) as a reference. Changes from the County’s HVA were made where appropriate to reflect distinctions in vulnerability and risk from natural hazards unique to Falls City, which are discussed throughout this addendum.

Table FC-2 shows the HVA matrix for Falls City, listing each hazard in order of rank from high to low. For local governments, conducting the hazard analysis is a useful step in planning for hazard mitigation, response, and recovery. The method provides the jurisdiction with a sense of hazard priorities but does not predict the occurrence of a particular hazard.

One catastrophic hazard (Cascadia Subduction Zone earthquake) and two chronic hazards (windstorm and landslide) rank as the top hazard threats to the City (Top Tier). Wildfire, flood, and extreme heat event comprise the next highest ranked hazards (Middle Tier), while winter storm, drought, crustal earthquake, and volcanic event comprise the lowest ranked hazards (Bottom Tier).

**Table FC-2 Hazard Analysis Matrix**

Hazard	History	Probability	Vulnerability	Maximum Threat	Threat Score	Hazard Rank	Tier
Windstorm	16	56	35	100	207	# 1	Top Tier
Earthquake (Cascadia)	2	49	50	100	201	# 2	
Landslide	2	56	45	90	193	# 3	
Wildfire	4	56	40	70	170	# 4	Middle Tier
Flood	4	56	35	70	165	# 5	
Extreme Heat Event	16	25	50	70	161	# 6	
Winter Storm	16	56	15	70	157	# 6	Bottom Tier
Drought	6	42	20	80	148	# 7	
Earthquake (Crustal)	2	7	15	30	54	# 8	
Volcanic Event	2	7	25	10	44	# 9	

Source: Falls City NHMP Steering Committee, 2023.

# Community Characteristics

Table FC-3 and the following section provide information on City specific demographics and characteristics. For additional information on the characteristics of Falls City, in terms of geography, environment, population, demographics, employment, and economics, as well as housing and transportation, see Volume III, Appendix C. 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.

Falls City is located in the mid-Willamette Valley nestled in the foothills of the Coast Range and is named for the Little Luckiamute Falls located in the center of town. The city is located on the Little Luckiamute River and covers an area of about 1.2 square miles.

The climate of Falls City is moderate; the average monthly temperatures range from 48 – 80 degrees in July and August, and 31-46 degrees in December and January, and the city receives approximately 74 inches of rain each year. Monthly precipitation is about 9-13 inches during the wetter months of November – March, and average about 0.3-1.9 inches during the drier months of June - September.

The city's topography is both a mix of relatively flat areas and steeper sloped areas along the western and northern edges of the city.

### **Population, Housing, and Income**

The City of Falls City had a population of 1,065 people per the 2020 Census, over an area of 1.2 square miles. Between 2016 and 2021, the City grew by 115 people (11%) (see Table FC-3 below). According to the State's official coordinated population forecast, between 2021 and 2040 the City's population is forecasted to increase to 1,337 (20%).

Most of the population is White/Caucasian (79%) and about 16% of the population is Hispanic or Latino. The poverty rate is high, at 28% (49% of children under 18, 18% for people 65 and older). Five percent (5%) do not have health insurance. The City has a fairly educated population, with 78% of residents with high school degrees or higher, and 11% with bachelor's degrees or higher. Approximately 14% of the population lives with a disability (14% of children under 18, 54% of seniors 65 or older). Almost half the population (43%) are either below 18 (29%) or over 65 (14%) years of age. About 10% of the population are 65 or older and living alone and 19% are single parents.

The City includes a diversity of land uses but is zoned primarily residential, with a large number of mobile homes, including RVs, vans, etc. About 65% of housing units are single-family and 35% are mobile homes. Almost half of homes (40%) were built before 1970 and 33% were built after 1990. Newer homes are more likely to be built to current seismic, flood, wildfire, and other hazard standards. Two-thirds (69%) of housing units are owner occupied, 29% are renter occupied, and 3% are vacant.

### **Transportation and Infrastructure**

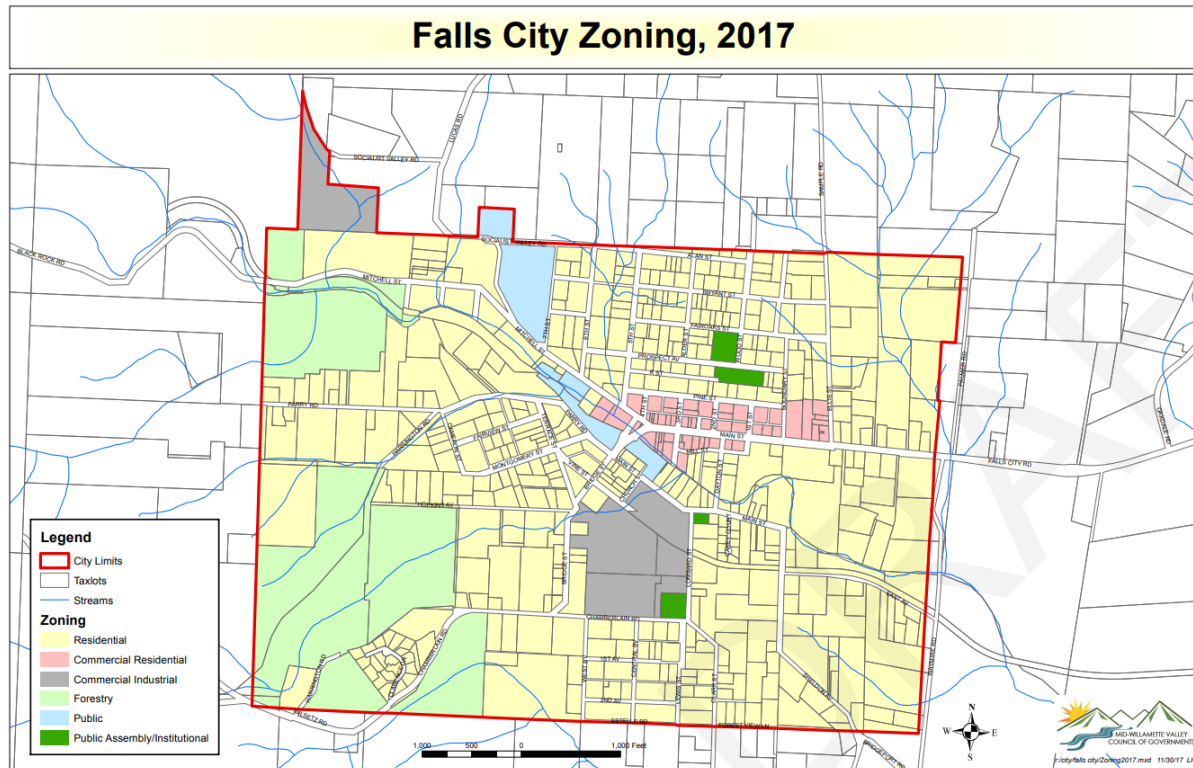
In the City of Falls City, transportation has played a major role in shaping the community. Today, the City of Falls City includes a diversity of land uses over 1.2 acres and relies heavily upon its road system. (See Figure FC-2 Falls City Zoning Map (2023).)

Falls City Road connects the city of Falls City to Oregon State Highway 223, 8 miles to the east, and then on to Monmouth (18 miles to the east of Falls City), providing Falls City residents with access to major shopping centers, employment, and governmental activities in Monmouth, Independence, and beyond in Salem.

Well over three-quarters of current residents live in single family homes (70%); mobile homes make up 8% of the housing stock. Forty percent (40%) of residences were built before 1970. Sixty-eight percent (69%) of housing units are homeowner occupied. New development has complied with the standards of the Oregon Building Code and the city's development code including their floodplain ordinance.

By far, motor vehicles represent the dominant mode of travel through and within Falls City. The mean travel time for workers (16+) is 35 minutes, with many Falls City residents commuting to Salem (in Marion County), which houses state buildings and offices. Eighty percent (80%) of workers drive alone to work. Of those who commute to work (in Polk County or Marion County), 12% carpool, less than 1% use motorcycles, less than 1% use public transit, and 2% bicycle or walk. The remainder (4%) work from home. 73% of owner-occupied homes have two cars available at home, whereas 28% of renter-occupied homes have no vehicle.

Figure FC-2 Falls City Zoning Map



Source: City of Falls City website (December 2023)

## Economy

In the past Falls City was a lumbermill town and once had three mills in operation, a bank, hotel, soda shop, jail, and several grocery stores and bars. It formerly supported a large logging population and other population centers in the hills of the Coast Range, such as the smaller lumber-based community of Black Rock and the company-owned mill town, Valsetz.

Today, Falls City benefits from its location near Salem, which is the State Capital and a regional center for industrial technology, engineering, research, commerce, and health care. Top industries for employment include in Falls City include social assistance, educational services, construction, and retail; however, most employment is outside of the city.

About 44% of the resident population 16 and over is in the labor force (736 people) and are employed in a variety of occupations including construction, extraction, and maintenance (28%), professional (12%), management, business, and financial (10%), office and administrative (9%), and production (9%) occupations.

**Table FC-3 Community Characteristics**

Population Characteristics			Household Characteristics		
<b>2016 Population Estimate</b>	950		<b>Housing Units</b>		
<b>2021 Population Estimate</b>	1,065		Single-Family (includes duplexes)	378	65%
<b>2040 Population Forecast*</b>	1,337		Multi-Family	0	0%
<b>Race</b>			Mobile Homes (includes RV, Van, etc.)	200	35%
American Indian and Alaska Native	4%		<b>Household Type</b>		
Asian	6%		Family Household	399	71%
Black/ African American	0%		Married couple (w/ children)	119	30%
Native Hawaiian and Other Pacific Islander	0%		Single (w/ children)	74	19%
White	79%		Living Alone 65+	58	10%
Some Other Race	1%		<b>Year Structure Built</b>		
Two or More Races	12%		Pre-1970	231	40%
<b>Hispanic or Latino/a (of any race)</b>	16%		1970-1989	158	27%
<b>Limited or No English Spoken</b>	2	0%	1990-2009	131	23%
<b>Vulnerable Age Groups</b>			2010 or later	58	10%
Less than 5 Years	91	5%	<b>Housing Tenure and Vacancy</b>		
Less than 18 Years	400	24%	Owner-occupied	396	69%
65 Years and Older	211	13%	Renter-occupied	167	29%
85 Years and Older	17	1%	Seasonal	0	0%
Age Dependency Ratio	57.3		Vacant	15	3%
<b>Disability Status (Percent age cohort)</b>			<b>Vehicles Available (Occupied Units)</b>		
Total Disabled Population	470	14%	No Vehicle (owner occupied)	21	5%
Children (Under 18)	56	14%	Two+ vehicles (owner occupied)	290	73%
Working Age (18 to 64)	301	28%	No Vehicle (renter occupied)	47	28%
Seniors (65 and older)	113	54%	Two+ vehicles (renter occupied)	90	54%
<b>Income Characteristics</b>			<b>Employment Characteristics</b>		
<b>Households by Income Category</b>			<b>Labor Force (Population 16+)</b>		
Less than \$15,000	121	22%	In labor Force (% Total Population)	736	44%
\$15,000-\$29,999	94	17%	Unemployed (% Labor Force)	112	15%
\$30,000-\$44,999	83	15%	<b>Occupation (Top 5) (Employed 16+)</b>		
\$45,000-\$59,999	57	10%	Construction, Extraction, and Maintainer	176	28%
\$60,000-\$74,999	45	8%	Professional and Related Occupations	72	12%
\$75,000-\$99,999	79	14%	Management, Business, and Financial	61	10%
\$100,000-\$199,999	72	13%	Office and Administrative Support Occ	57	9%
\$200,000 or more	12	2%	Production Occupations	56	9%
<b>Median Household Income</b>	\$37,969		<b>Health Insurance</b>		
<b>Gini Index of Income Inequality</b>	0.52		No Health Insurance	84	5%
<b>Poverty Rates (Percent age cohort)</b>			Public Health Insurance	1,112	66%
Total Population	471	28%	Private Health Insurance	634	38%
Children (Under 18)	189	49%	<b>Transportation to Work (Workers 16+)</b>		
Working Age (18 to 64)	244	23%	Drove Alone	491	80%
Seniors (65 and older)	38	18%	Carpooled	74	12%
<b>Housing Cost Burden (Cost &gt; 30% of household income)</b>			Public Transit	1	< 1%
Owners with a Mortgage	89	23%	Motorcycle	3	< 1%
Owners without a Mortgage	43	11%	Bicycle/Walk	12	2%
Renters	91	55%	Work at Home	26	4%

Source: U.S. Census Bureau, 2017-2021 American Community Survey 5-Year Estimates; Portland State University, Population Research Center, "Annual Population Estimates, Table 4", 2016 and 2021; and "Population Forecasts, Summary Tab", 2022.

Note 1: \* = Population forecast within UGB

Note 2: ACS 5-year estimates represent average characteristics from 2017-2021. Sampling error may result in low reliability of data. This information or data is provided with the understanding that conclusions drawn from such information are the responsibility of the user. Refer to the original [source](#) documentation to better understand the data sources, results, methodologies and limitations of each dataset presented.

## Disadvantaged populations

There are several federal and state agencies working to identify and address the qualities that make some communities more disadvantaged than others and reduce their ability to rebound from natural disasters. These issues include disparities within economic, health, environment, housing, and other areas. Polk County contains a number of disadvantaged populations as indicated by the indexes below.

The [Oregon Office of Rural Health](#) defines “rural” as any geographic areas in Oregon ten or more miles from the centroid of a population center of 40,000 people or more. In Polk County, Falls City, Falls City, Grand Ronde, and Monmouth qualify as “rural” under this threshold.

### Disadvantaged Community

Per FEMA’s [Grant Equity Threshold Tool](#), the lands of the Grand Ronde Tribe that are adjacent to or within Falls City classified as “disadvantaged” due to health concerns and water/wastewater issues. Communities are identified as disadvantaged for CLIMATE CHANGE. Communities are identified as disadvantaged for climate change if they are in census tracts that: ARE at or above the 90th percentile for expected agriculture loss rate OR expected building loss rate OR expected population loss rate OR projected flood risk OR projected wildfire risk AND are at or above the 65th percentile for low income.

### Medically Underserved

The [Health Resource and Service Administration](#) classifies Falls City as a within a Health Provider Shortage Area (HPSA), due to its shortage in dental, primary, and mental health care providers.

### Community Resilience-Challenged

Polk County is identified as a 43 of 100 on FEMA’s [Community Resilience Challenges Index](#) due to high numbers of residents with a disability, high numbers of single-parent households, low numbers of medical practitioners and hospitals (0.00 hospitals per 10,000 people), high number of households without a smartphone (13.54%) and high poverty levels (12%).<sup>2</sup>

The rural community of Falls City is specifically challenged by persistent poverty levels that are much higher than the County’s average (at 28%).

### Economically Distressed

Business Oregon gives priority when funding technical assistance, programs, and projects to geographic areas determined to be economically distressed as prescribed by Oregon law, based on 2016-2020 ACS data. The [list](#) is updated annually.

Within Polk County, the cities of **Falls City, Falls City, Grand Ronde, Independence, Monmouth, Salem,** and Willamina were identified as being *Economically Distressed* by Business Oregon in 2022.

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<sup>2</sup> FEMA, [Resilience Analysis and Planning Tool \(RAPT\)](#) (arcgis.com), accessed December 2023.

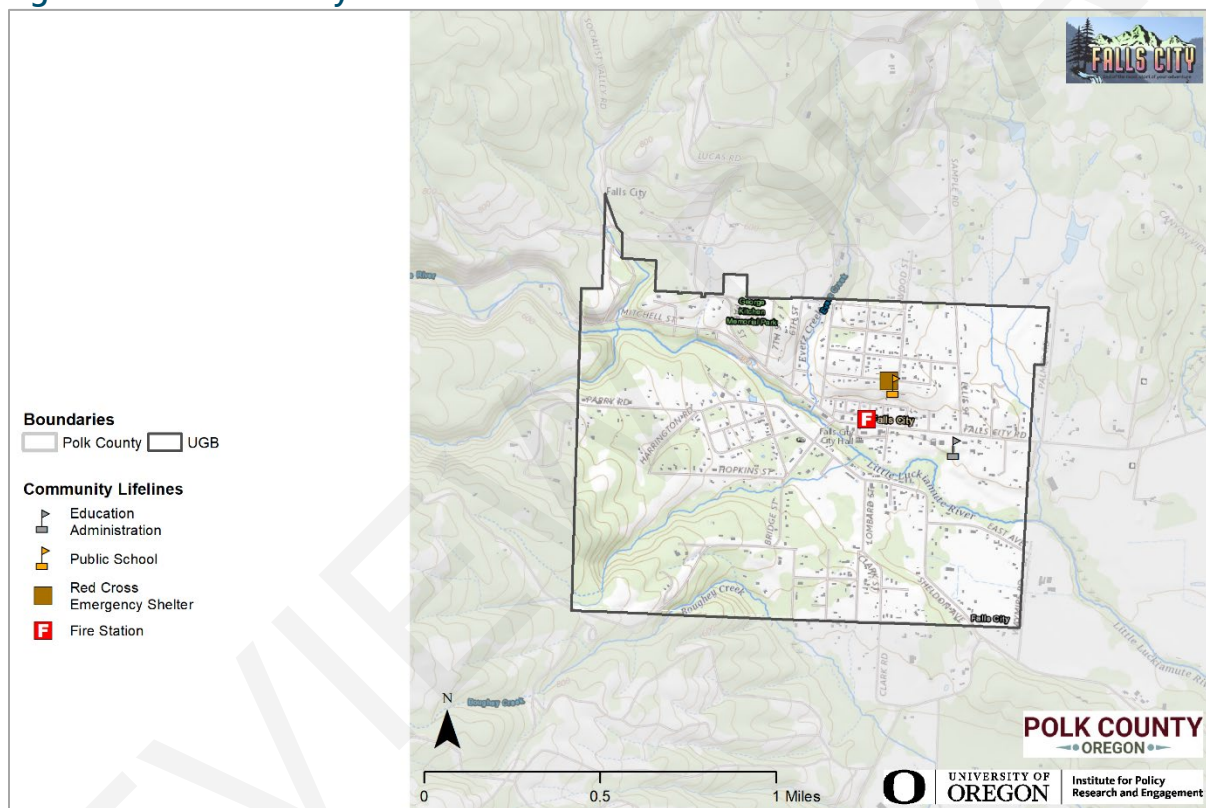


# Community Lifelines

This section outlines the resources, facilities, and infrastructure that, if damaged, could significantly impact the public safety, economic conditions, and environmental integrity of Falls City. Community Lifelines are the most fundamental services in the community that, when stabilized, enable all other aspects of society to function. Mitigating these facilities will increase the community’s resilience.

Community lifelines and historic structures in Falls City are shown in Figure FC-3 and Table FC-4. This integrated network of assets, services, and capabilities are used day-to-day to support the recurring needs of the community and enable all other aspects of society to function. Decisive intervention (e.g., rapid re-establishment or employment of contingency response solutions) is required to maintain/reestablish these facilities and services following a hazard incident.

Figure FC-3 Community Lifelines



Source: Oregon Partnership for Disaster Resilience, Oregon Department of Geology and Mineral Industries.

Note: To view detail click this [link](#) to access Oregon HazVu

**Table FC-4 Community Lifelines**

Critical Facilities by Community	Flood 1% Annual Chance	CSZ Earthquake Moderate to Complete Damage	Turner and Mill Creek Fault Earthquake Moderate to Complete Damage	Landslide High and Very High Susceptibility	Wildfire High and Moderate Risk
	Exposed	>50% Prob.	>50% Prob.	Exposed	Exposed
Falls City City Hall and Public Works	-	-	-	X	-
Falls City Elementary School	-	-	-	X	-
Falls City Fire Department	-	-	-	X	-
Falls City High School	-	-	-	X	-

Source: Oregon Department of Geology and Mineral Industries, Falls City NHMP Steering Committee

## Critical Facilities

Facilities that are critical to government response and recovery activities (i.e., life, safety, property, and environmental protection) include: 911 Centers, Emergency Operations Centers, Police and Fire Stations, Public Works facilities, sewer and water facilities, hospitals, bridges, roads, shelters, and more. Facilities that, if damaged, could cause serious secondary impacts may also be considered “critical.” A hazardous material facility is one example of this type of critical facility.

## Essential Facilities

Facilities that are essential to the continued delivery of key government services and/or that may significantly impact the public’s ability to recover from the emergency may include City buildings such as the Public Services Building, the City Hall, and other public facilities such as schools.

### City/County/Other:

- Teal Creek Water Treatment Plant and water storage
- Wastewater Treatment Plant
- City Maintenance Storage Building
- Falls City City Hall and Public Works
- Falls City Fire Department
- US Post Office
- Fair Oaks Pump Station

### Schools:

- Falls City Elementary School
- Falls City High School

### Potential Shelter Sites:

- Mountain Gospel Fellowship
- Seventh-Day Adventist Church
- United Methodist Church
- Falls City First Christian Church

## Environmental Facilities

Environmental assets are those parks, green spaces, wetlands, and rivers that provide an aesthetic and functional ecosystem service for the community include: George Kitchin Memorial Park, Michael Harding Memorial Park, Fay Wilson Memorial Park, Lower Cemetery, Upper Cemetery.

## Vulnerable Populations

Vulnerable populations, including seniors, disabled citizens, women, and children, as well those people living in poverty, often experience the impacts of natural hazards and disasters more acutely. Populations that have special needs or require special consideration include schools, daycare centers, adult care centers, medical facilities, mobile home parks, and senior housing.

## Hazardous Materials

Facilities that, if damaged, could cause serious secondary impacts may also be considered “critical.” Hazardous materials sites are particularly vulnerable to earthquake, landslide, volcanic event, wildfire, and winter storm hazards. A hazardous material facility is one example of this type of critical facility. Those sites that store, manufacture, or use potentially hazardous materials include Gas Stations, water and wastewater treatment facilities, and the Public Works shop.

## Economic Assets/Population Centers

Economic assets include businesses that employ large numbers of people and provide an economic resource to the city of Happy Valley. If damaged, the loss of these economic assets could significantly affect economic stability, and prosperity. Population Centers usually are aligned with economic centers and are a concern during evacuation/notification during a hazard event.

## Cultural and Historic Assets

The cultural and historic heritage of a community is more than just tourist charm. For families that have lived in the city for generations and new resident alike, it is the unique places, stories, and annual events that make the community an appealing place to live. The cultural and historic assets are both intangible benefits and obvious quality-of-life- enhancing amenities. Because of their role in defining and supporting the community, protecting these resources from the impact of disasters is important.

# Hazard Profiles

The following sections briefly describe relevant information for each profiled hazard. More information on Polk County hazards can be found in Volume 1, Section 2 *Risk Assessment* and in the [Risk Assessment for Region 4, Southwest Oregon, Oregon SNHMP \(2020\)](#).

## Drought

The steering committee determined that the City’s probability for drought is **low** (which is lower than the County’s rating) and that their vulnerability to drought is **moderate** (which is the same than the County’s rating). *These ratings have not changed since the previous version of the NHMP.*

Volume I, Section 2 describes the characteristics of drought hazards, history, how they relate to future climate projections (see [OCCRI report](#)), as well as the location, extent, and probability of a potential event. Due to the climate of Polk County, past and present weather conditions have shown an increasing potential for drought.

Falls City’s primary water supply comes from the Teal Creek and Glaze Creek drainages. The city has one (1) storage reservoir for a total of 600,000 gallons of treated water storage capacity. The city’s water treatment plant has been operating since 1998. Oregon Health Authority (OHA) has approved the Water Master Plan in 2017. In general, water supply is available and sufficient.

### Vulnerability Assessment

A comprehensive risk and vulnerability assessment is not available for the drought hazard. Statewide droughts have historically occurred in Oregon, and as it is a region-wide phenomenon, all residents are equally at risk. Structural damage from drought is not expected; rather the risks are present to humans and resources. Agriculture, fishing, and timber have historically been impacted, as well as local and regional economies.

### Future Projections

According to the Oregon Climate Change Research Institute “Future Climate Projections, Polk County,”<sup>3</sup> drought, as represented by low summer soil moisture, low spring snowpack, low summer runoff, and low summer precipitation, is projected to become more frequent in Polk County by the 2050s. The incidence of related negative physical and mental health outcomes, especially among low income, tribal, rural, and agricultural communities, is likely to increase.

Increasingly frequent droughts will have economic and social impacts upon those who depend upon predictable growing periods (ranches, farms, vineyards, gardeners) as well as upon the price and availability of fresh vegetables. It may also stress local jurisdiction’s ability to provide water for irrigation or commercial and household use.

## Earthquake (Cascadia)

The steering committee determined that the City’s probability for a Cascadia Subduction Zone (CSZ) earthquake is **high** (which is the higher than the County’s rating) and that their vulnerability to a CSZ earthquake is **high** (which is the same as the County’s rating). *The probability and vulnerability rating stayed the same since the previous version of the NHMP.*

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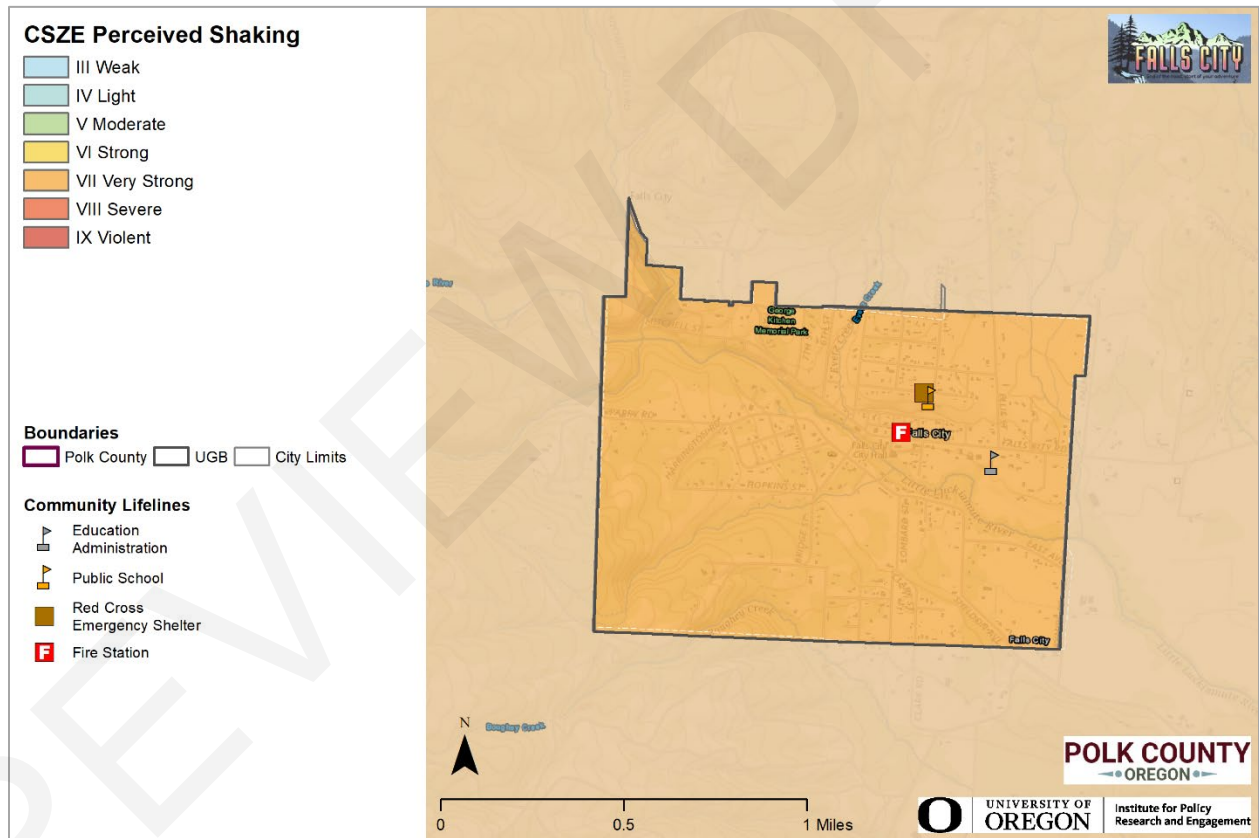
<sup>3</sup> Oregon Climate Change Research Institute, *Future Climate Projections, Polk County, Oregon*. May 2023.

The Cascadia Subduction Zone is a 680-mile-long zone of active tectonic convergence where oceanic crust of the Juan de Fuca Plate is subducting beneath the North American continent at a rate of 4 cm per year. Scientists have found evidence that 11 large, tsunami-producing earthquakes have occurred off the Pacific Northwest coast in the past 6,000 years. These earthquakes took place roughly between 300 and 5,400 years ago with an average occurrence interval of about 510 years. The most recent of these large earthquakes took place in 1700 A.D.<sup>4</sup>

Volume I, Section 2 describes the characteristics of earthquake hazards and their history, as well as the location, extent, and probability of a potential event. Generally, an event that affects the County is likely to affect Falls City as well. The causes and characteristics of an earthquake event are appropriately described within Volume I, Section 2, as well as are the location and extent of potential hazards. Previous occurrences are well documented within Volume I, Section 2. The community impacts described for the County would generally be the same for Falls City.

Figure FC-4 displays perceived shaking hazards from a Cascadia Subduction Zone earthquake event (darker areas represent greater concern). All of Falls City is within the Very Strong shaking zone.

**Figure FC-4 Cascadia Subduction Zone Perceived Shaking**



Source: Oregon HazVu: Statewide Geohazards Viewer (DOGAMI)  
 Note: To view detail click this [link](#) to access Oregon HazVu.

<sup>4</sup> The Cascadia Region Earthquake Workgroup, 2005. Cascadia Subduction Zone Earthquakes: A magnitude 9.0 earthquake scenario. <http://www.crew.org/PDFs/CREWSubductionZoneSmall.pdf>

The local faults, the county’s proximity to the Cascadia Subduction Zone, potential slope instability, and the prevalence of certain soils subject to liquefaction and amplification combine to give the county a high-risk profile. Due to the expected pattern of damage resulting from a CSZ event, the Oregon Resilience Plan divides the State into four distinct zones and places Polk County predominately within the “Valley Zone” (Valley Zone, from the summit of the Coast Range to the summit of the Cascades). Within the Valley Zone, damage and shaking is expected to be strong and widespread - an event will be disruptive to daily life and commerce and the main priority is expected to be restoring services to business and residents.

As noted in the community profile, approximately 40% of residential buildings in Falls City were built prior to 1970 and 35% are manufactured homes. Built prior to the adoption of seismic standards, structures are likely inadequate to withstand the impacts of an earthquake.

Information on specific public buildings’ (schools and public safety) estimated seismic resistance, determined by DOGAMI in 2007, is shown in Table FC-5; each “X” represents one building within that ranking category. Of the facilities evaluated by DOGAMI using a Rapid Visual Survey (RVS), one building has collapse potential of low (Falls City Fire Department). *See Mitigation Successes for a list of facilities that have seismic retrofits.*

**Table FC-5 Rapid Visual Survey Scores**

Facility	Site ID*	Level of Collapse Potential			
		Low (< 1%)	Moderate (>1%)	High (>10%)	Very High (100%)
<b>Public Safety</b>					
Falls City Fire Department (320 N Main St)	Polk_fir09	X			

Source: [DOGAMI 2007. Open File Report 0-07-02. Statewide Seismic Needs Assessment Using Rapid Visual Assessment.](#) “\*” – Site ID is referenced on the [RVS Polk County Map](#).

In addition to building damage, utility (electric power, water, wastewater, natural gas) and transportation systems (bridges, pipelines) are also likely to experience significant damage. There is a low probability that a major earthquake will result in failure of upstream dams.

Utility systems will be significantly damaged, including damaged buildings and damage to utility infrastructure, including water and wastewater treatment plants and equipment at high voltage substations (especially 230 kV or higher which are more vulnerable than lower voltage substations). Buried pipe systems will suffer extensive damage with approximately one break per mile in soft soil areas. There would be a much lower rate of pipe breaks in other areas. Restoration of utility services will require substantial mutual aid from utilities outside of the affected area.

## Earthquake (Crustal)

The steering committee determined that the City’s probability for a crustal earthquake is **low** (which is the same as the County’s rating) and that their vulnerability to crustal earthquake is **moderate** (which is higher than the County’s rating). *These ratings have not changed since the previous version of this NHMP.*

### Turner and Mill Creek Fault Scenario (Mw 6.6)

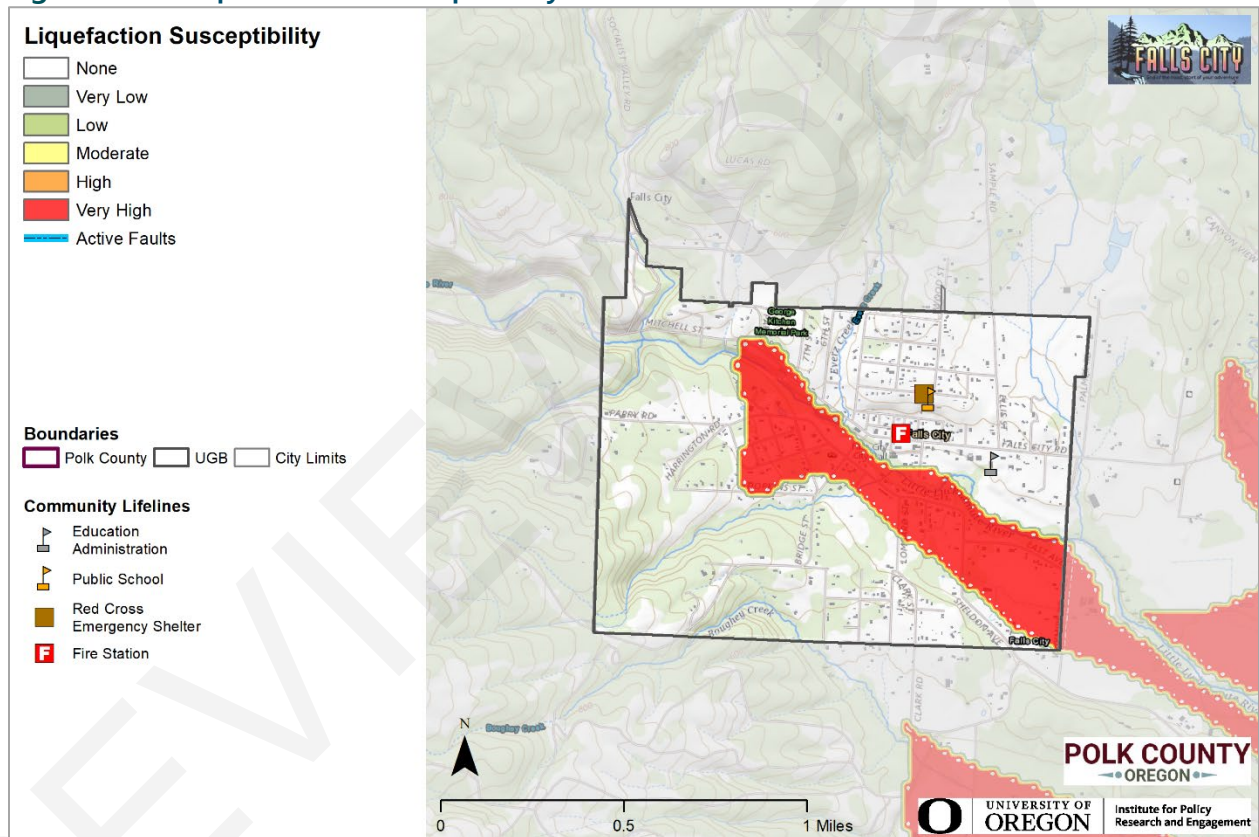
The Turner and Mill Creek Fault, located approximately 8 miles (~13 km) east of Independence and oriented east to west, is an ~11-mile (18 km) Quaternary fault estimated to slip less than 0.2mm/yr. The

estimated maximum fault displacement for the Turner and Mill Creek Fault could produce relatively large (Mw-6.6) earthquakes, enough to pose a serious seismic threat to the communities in the vicinity of the eastern portion of Polk County.<sup>5</sup>

Volume I, Section 2 describes the characteristics of earthquake hazards and their history, as well as the location, extent, and probability of a potential event. Generally, an event that affects the county is likely to affect Falls City as well. The causes and characteristics of an earthquake event are appropriately described within Volume I, Section 2, as well as the location and extent of potential hazards. Previous occurrences are well-documented within Volume I, Section 2 and the community impacts described by the County would generally be the same for Falls City.

Figure FC-6 shows the liquefaction risk to the community lifelines that are identified in more detail in Table FC-4. As shown in the figures, the area of greatest concern near the City of Falls City (darker area) is in the center of the City adjacent to old river beds.

**Figure FC-5 Liquefaction Susceptibility**



Source: Oregon Partnership for Disaster Resilience. Oregon Department of Geology and Mineral Industries.

Note: To view detail click this [link](#) to access Oregon HazVu.

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.

<sup>5</sup> Multi-Hazard Risk Report for Polk County, DOGAMI, 2024



## Vulnerability Assessment

In 2024, DOGAMI created a Risk Report (O-24-XX<sup>6</sup>) for Polk County that provides hazard analysis summary tables that identify populations and property that are vulnerable to the earthquake hazard. Identified community lifelines that are exposed to this hazard are shown in Table FC-4. No development changes affected the jurisdiction's overall vulnerability to this hazard. Loss estimates for earthquake events in the city are shown below:

### *Cascadia Subduction Zone Scenario (Mw 9.0)*

The city is expected to experience damage to 115 buildings (no critical facilities). These structures are expected to experience a potential loss of \$11 million (a loss ratio of 11%). In addition, there is the potential for 37 residents to be displaced (3.6% of the population).

### *Turner and Mill Creek Fault Scenario (Mw 6.6)*

The city is expected to experience damage to 36 buildings (no critical facilities). These structures are expected to experience a potential loss of \$3.6 million (a loss ratio of 3.6%). In addition, there is the potential for 12 residents to be displaced (1.2% of the population).

Identified community lifelines that are exposed to this hazard are shown in Table FC-4. Note that even if a facility has exposure, *it does not mean there is a high risk (vulnerability)*. No development changes affected the jurisdiction's overall vulnerability to this hazard.

## Future Projections

Future development (residential, commercial, or industrial) within the city will be at risk to earthquake impacts, although this risk can be mitigated by the adoption and enforcement of high development and building standards. Reducing risks to vulnerable populations should be considered during the redevelopment of existing properties.

## Flood

The steering committee determined that the City's probability for flood is **high** (which is the same as the County's rating) and that their vulnerability to flood is **moderate** (which is the same as the County's rating). *These ratings have not changed since the previous version of this NHMP.*

Volume I, Section 2 describes the characteristics of flood hazards, history, and how they relate to future climate projections (see [OCCRI report](#)), as well as the location, extent, and probability of a potential event. Portions of Falls City have areas of flood plains (special flood hazard areas). Portions of Falls City have areas of flood plains (special flood hazard areas). These include areas along the Little Luckiamute River (Figure FC-6). Other portions of Falls City, outside of the mapped floodplains, are also subject to significant, repetitive flooding from local storm water drainage. In general, the 100-year floodplain delineates an area of high risk, while the 500-year floodplain delineates an area of moderate risk.

The following incident has occurred since the previous plan:

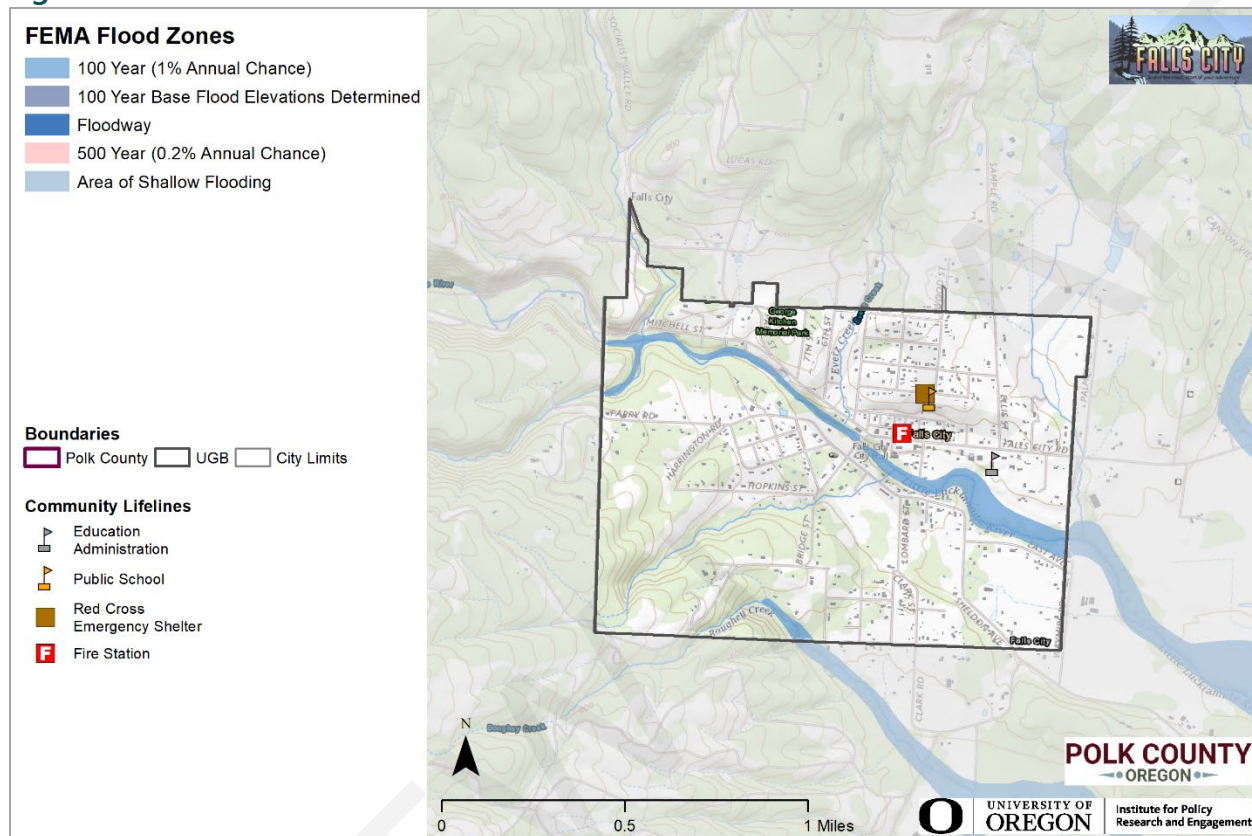
- 12/07/2016 DR-4258: Flooding – culverts along Mitchell Road at GPS Location 44.869807 - 123.443991 was damaged by fast flowing floodwaters that overwhelmed this facility washing out the culverts and road at this site as a direct result of Sever Winter Storms, Straight-lines Winds, Flooding and Mud Slides.
- 1/17-21/2012: DR-4055: Flooding – severe winter storm and overland flooding inundated Falls City with record amounts of rainfall damaged 10 sites.

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<sup>6</sup> DOGAMI, Multi-Hazard Risk Report for Polk County, Oregon (O-24-XX, February 2024), Table A-12.

Flooding along the creeks is most frequent from October through April during periods of heavy rain and/or snowmelt. Because the drainage areas of these creeks are small, flash floods may occur where the extent of flooding is influenced by runoff over a short period of time.

**Figure FC-6 FEMA Flood Zones**



Source: Oregon Partnership for Disaster Resilience. Oregon HazVu: Statewide Geohazards Viewer (DOGAMI) Note: To view detail click this [link](#) to access Oregon HazVu.

### Vulnerability Assessment

Due to insufficient data and resources, Falls City is currently unable to perform a quantitative risk assessment for this hazard. No development changes affected the jurisdiction’s overall vulnerability to this hazard. Note that even if a facility has exposure, *it does not mean there is a high risk (vulnerability)*.

The City is at risk from two types of flooding: riverine and urban. Riverine flooding occurs when streams overflow their banks and inundate low-lying areas. This is a natural process that adds sediment and nutrients to fertile floodplain areas. It usually results from prolonged periods of precipitation over a wide geographic area. Low velocity sheets of water generally flood most areas that are prone to flooding. Urban flooding occurs as land is converted to impervious surfaces and hydrologic systems are changed. Precipitation is collected and transmitted to streams at a much faster rate, causing floodwaters to rise rapidly and peak with violent force. During urban flooding, storm drains can back up and cause localized flooding of streets and basements.

Floods can have a devastating impact on almost every aspect of the community, including private property damage, public infrastructure damage, and economic loss from business interruption. It is

important for the City to be aware of flooding impacts and assess its level of risk. The City has been proactive in mitigating flood hazards by purchasing floodplain property.

The economic losses due to business closures often total more than the initial property losses that result from flood events. Flood events significantly impact business owners and their employees. Direct damages from flooding are the most common impacts, but indirect damages, such as diminished clientele, can be just as debilitating to a business. According to the previous version of this plan approximately 74 residential structures (value \$7.2M), two government facilities (value \$749K), three community facilities (value \$281K), and three bridges (value \$2.2M) are located within the 100-year floodplain.<sup>7</sup>

If major flooding affected all of the main transportation routes in Falls City, traffic flow in and out of the City would be significantly affected, but all avenues would not be cut off. The amount of property in the floodplain is not a large area but damage could be significant as it would affect residential, commercial, and public property. Floodwaters can affect building foundations, seep into basements or cause damage to the interior, exterior, and contents of buildings, dependent upon the velocity and depth of the water and by the presence of floating debris. The City sewer system can overflow during flood events and cause further property damage.

For mitigation planning purposes, it is important to recognize that flood risk for a community is not limited only to areas of mapped floodplains. Other portions of Falls City outside of the mapped floodplains may also be at relatively high risk from over bank flooding from streams too small to be mapped by FEMA or from local storm water drainage.

#### Natural Hazard Risk Report<sup>8</sup>

In 2024, DOGAMI created a Risk Report (O-24-XX) for Polk County that provides hazard analysis summary tables that identify populations and property that are vulnerable to the flood hazard in Falls City. No identified community lifelines are exposed to this hazard per this report. No development changes affected the jurisdiction's overall vulnerability to this hazard.

#### Future Projections

According to the Oregon Climate Change Research Institute ([OCCRI report](#)) "Future Climate Projections, Polk County,"<sup>9</sup> winter flood risk at mid- to low elevations in Polk County, where temperatures are near freezing during winter and precipitation is a mix of rain and snow, is projected to increase as winter temperatures increase. The temperature increase will lead to an increase in the percentage of precipitation falling as rain rather than snow. The projected increases in total precipitation, and in rain relative to snow, likely will increase flood magnitudes in the region. Vulnerable populations adjacent to floodways (including the unhoused, manufactured home communities, and campground occupants) will be more at risk as the winter flood risk increases.

#### National Flood Insurance Program (NFIP)

FEMA updated the Flood Insurance Study (FIS) and Flood Insurance Rate Maps (FIRMs) for Polk County and Incorporated areas in 2006 (effective December 2006). The City complies with the NFIP through enforcement of their flood damage prevention ordinance and their floodplain management program. Their flood damage prevention ordinance includes substantial damage/substantial improvement

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<sup>7</sup> URS, 2009 Polk County Natural Hazards Mitigation Plan; values are in 2009 dollars.

<sup>8</sup> DOGAMI, Multi-Hazard Risk Report for Polk County, Oregon (O-24-XX, February 2024), Table A-12.

<sup>9</sup> Oregon Climate Change Research Institute, *Future Climate Projections, Polk County, Oregon*. May 2023.

provisions. There has not been a Community Assistance Visit (CAV). The City does not participate in the Community Rating System (CRS).

The Community Repetitive Loss record for Falls City does not include any Repetitive Loss Properties<sup>10</sup> or Severe Repetitive Loss Properties.<sup>11</sup>

## Landslide

The steering committee determined that the City's probability for landslide is **high** (which is the same as the County's rating) and that their vulnerability to landslides is **high** (which is higher than the County's rating). *The probability and vulnerability ratings stayed the same since the previous version of the NHMP.*

Volume I, Section 2 describes the characteristics of landslide hazards, their history within Polk County, and how they relate to future climate projections (see [OCCRI report](#)), as well as the location, extent, and probability of a potential event within the region.

Falls City is underlain by igneous and sedimentary rock. Igneous bedrocks (volcanic) origin is found primarily in the higher and steeper southwest portion of the city and along the Little Luckiamute River from the city's bridge upstream. Sedimentary rock is primarily siltstone with some sandstone and dip slightly toward the east. Sedimentary rock is less resistant to stream action than the igneous rock and when the sedimentary rock is eroded away the igneous rock is undermined causing large-scale block sliding.<sup>12</sup> Volume I, Section 2, *Risk Assessment*, adequately describes the causes and characteristics of landslides, and appropriately identifies previous landslide occurrences within the region.

Landslide susceptibility exposure for Falls City is shown in Figure FC-7. Approximately 59% of Falls City has High, and approximately 16% Moderate, landslide susceptibility exposure<sup>13</sup>.

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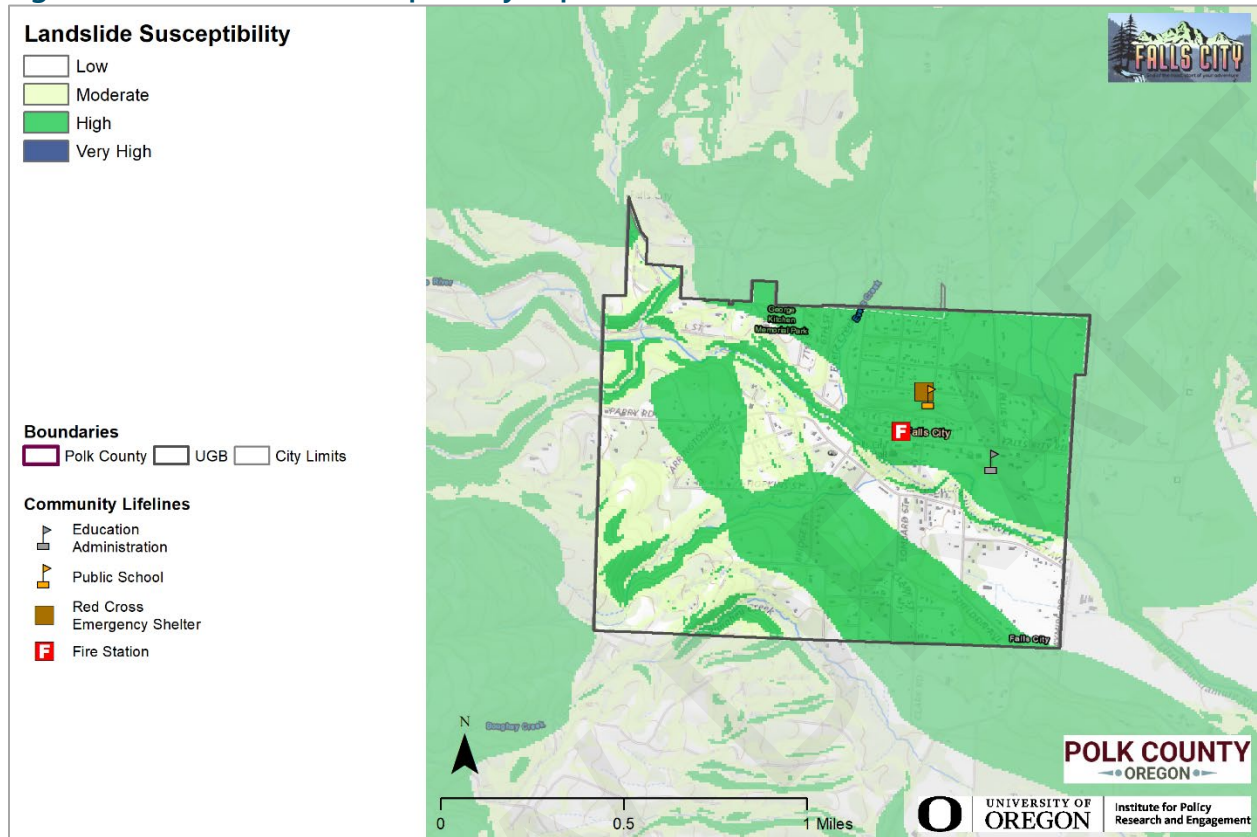
<sup>10</sup> A Repetitive Loss (RL) property is any insurable building for which two or more claims of more than \$1,000 were paid by the National Flood Insurance Program (NFIP) within any rolling ten-year period, since 1978. A RL property may or may not be currently insured by the NFIP.

<sup>11</sup> A Severe Repetitive Loss (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.

<sup>12</sup> Falls City Comprehensive Plan (2013).

<sup>13</sup> DOGAMI Open-File Report, O-16-02, Landslide Susceptibility Overview Map of Oregon (2016).

**Figure FC-7 Landslide Susceptibility Exposure**



Source: Oregon Partnership for Disaster Resilience. Oregon Department of Geology and Mineral Industries.

Note: To view detail click this [link](#) to access Oregon HazVu.

### Vulnerability Assessment

DOGAMI completed a statewide landslide susceptibility assessment in 2016 (O-16-02), general findings from that report are provided above.

Identified community lifelines that are exposed to this hazard are shown in Table FC-4. *Note that even if an area has a high percentage of land in a high or very high landslide exposure susceptibility zone, this does not mean there is a high risk (vulnerability), because risk is the intersection of a hazard and assets.*

According to the previous version of this plan approximately 419 residential structures (value \$40.6M), three government facilities (value \$1.2M), one emergency response facility (value \$1.2M), two educational facilities (value \$1.7M), ten community facilities (value \$866K), three bridges (value \$2.2M), and two utility facilities (value \$8.4M) were in moderate risk areas. There are 206 residential structures (value \$20M), one educational facility (value \$1M), and three community facilities (values unknown) located within high landslide risk areas.<sup>14</sup>

Potential landslide-related impacts are adequately described within Volume I, Section 2 and include infrastructural damages, economic impacts (due to isolation and/or arterial road closures), property damages, and obstruction to evacuation routes. Rain-induced landslides and debris flows can potentially

<sup>14</sup> URS, 2009 Polk County Natural Hazards Mitigation Plan; values are in 2009 dollars.

occur during any winter in Polk County and thoroughfares beyond City limits are susceptible to obstruction as well.

The most common type of landslides in Polk County are slides caused by erosion. Slides move in contact with the underlying surface, are generally slow moving and can be deep. Rainfall-initiated landslides tend to be smaller; while earthquake induced landslides may be quite large. All soil types can be affected by natural landslide triggering conditions.

#### Natural Hazard Risk Report<sup>15</sup>

In 2024, DOGAMI created a Risk Report (O-24-XX) for Polk County that provides hazard analysis summary tables that identify populations and property that are vulnerable to the landslide hazard. Identified community lifelines that are exposed to this hazard are shown in Table FC-4. No development changes affected the jurisdiction's overall vulnerability to this hazard. Loss estimates for landslide events in the city are shown below:

There are 446 buildings (4 critical facilities) exposed to the high and very high landslide susceptibility hazard. These structures represent a building replacement value of \$69 million (69% of total building replacement value). In addition, there is the potential for 692 residents to be displaced (67% of the population).

#### Future Projections

Landslides are often triggered by rainfall when the soil becomes saturated. As a surrogate measure of landslide risk, the Oregon Climate Change Research Institute ([OCCRI report](#)) report looks at extreme precipitation. In Polk County, the number of days per year with at least 0.75 inches of precipitation is not projected to change substantially. Nevertheless, by the 2050s, the amount of precipitation on the wettest day and wettest consecutive five days per year is projected to increase by an average of 14% (range 2–33%) and 11% (range 2–22%), respectively, relative to the 1971–2000 historical baselines, under the higher emissions scenario. The number of days per year that exceeded a threshold for landslide risk, which is based on prior 18-day precipitation accumulation, is not projected to change substantially. However, landslide risk depends on multiple factors, and this metric does not reflect all aspects of the hazard.

## Severe Weather

Severe weather can account for a variety of intense and potentially damaging weather events. These events include extreme heat, windstorms, and winter storms. The following section describes the unique probability and vulnerability of each identified weather hazard.

### Extreme Heat Event

The steering committee determined that the City's probability for extreme heat event is **moderate** (which is the same as the County's Rating) and that their vulnerability to an extreme heat event is **high** (which is higher than the County's Rating). *The City did not assess the extreme heat event hazard in the previous version of the NHMP.*

Polk County's NHMP Volume I, Section 2, adequately describes the causes and characteristics of extreme heat, as well as the history, location, extent, and probability of a potential event and how it relates to future climate projections (see [OCCRI report](#)). Generally, an event that affects the County is likely to affect the City as well. A severe heat episode or "heat wave" occurs about every two to three years, and

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<sup>15</sup> DOGAMI, Multi-Hazard Risk Report for Polk County, Oregon (O-24-XX, February 2024), Table A-12.

typically lasts two to three days but can last as many as five days. A severe heat episode can be defined as consecutive days of temperatures in the high 90s and above 100. Severe heat hazard can be described as the average number of days with temperatures greater than or equal to 90-degrees Fahrenheit.<sup>16</sup>

Extreme heat events can and have occurred in the city. While they typically do not cause loss of life, they are becoming more frequent and have the potential to impact economic activity as well as quality of life and have caused threats to life in some cases. Changes in climate indicate that the area should expect to see more extreme heat events resulting from hazards.

### Future Projections

According to the Oregon Climate Change Research Institute ([OCCRI report](#)) “Future Climate Projections, Polk County,”<sup>17</sup> the number, duration, and intensity of extreme heat events will increase as temperatures continue to warm. In Polk County, the number of extremely hot days (those on which the temperature is 90°F or higher) and the temperature on the hottest day of the year are projected to increase by the 2020s and 2050s under both the lower and higher emissions scenarios. The number of days per year with temperatures 90°F or higher is projected to increase by an average of 17 (range 6–30) by the 2050s, relative to the 1971–2000 historical baselines, under the higher emissions scenario. The temperature on the hottest day of the year is projected to increase by an average of about 6°F (range 1–9°F) by the 2050s. Projected demographic changes in Polk County, such as an increase in the proportion of older adults and the absolute number of children, will increase the number of people in some of the populations that are vulnerable to extreme heat.

## Windstorm

The steering committee determined that the City’s probability for windstorms is **high** (which is the same as the County’s rating) and that their vulnerability to windstorms is **moderate** (which is the same as the County’s rating). *The probability rating increased, and the vulnerability rating remained the same since the previous version of the NHMP.*

Volume I, Section 2 describes the characteristics of windstorm hazards, history, and how they relate to future climate projections (see [OCCRI report](#)), as well as the location, extent, and probability of a potential event within the region. Because windstorms typically occur during winter months, they are sometimes accompanied by ice, freezing rain, flooding, and very rarely, snow. Other severe weather events that may accompany windstorms, including thunderstorms, hail, lightning strikes, and tornadoes are generally negligible for Falls City.

Volume I, Section 2 describes the impacts caused by windstorms, including power outages, downed trees, heavy precipitation, building damages, and storm-related debris. Additionally, transportation and economic disruptions result as well. About once or twice per year the city will experience a windstorm event that will interrupt services, experience downed trees, and cause power outages. In 2012, high winds, heavy rains, and flooding inundated Falls City, Oregon with record amounts of rainfall and damaged local streets.

Damage from high winds generally has resulted in downed utility lines and trees. Electrical power can be out anywhere from a few hours to several days. Outdoor signs have also suffered damage. If the high winds are accompanied by rain (which they often are), blowing leaves and debris clog drainage-ways, which in turn causes localized urban flooding.

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<sup>16</sup> DLCD, *Oregon State Natural Hazard Mitigation Plan*, 2020.

<sup>17</sup> Oregon Climate Change Research Institute, *Future Climate Projections, Polk County, Oregon*. May 2023.

## Future Projections

Wind patterns affect provision of electricity, transportation safety, and the spread of wildfires and pollutants. Mean wind speeds in Oregon are projected to decrease slightly, but extreme winter wind speeds may increase, especially in western Oregon. The frequency of strong easterly winds during summer and autumn, however, is projected to decrease slightly. Those impacted by windstorms at present, including older residential or commercial developments with above-ground utilities, poor insulation or older construction, heavy tree canopies, or poor storm drainage, will continue to be impacted by windstorms in the future.

## Winter Storm (Snow/Ice)

The steering committee determined that the City's probability for winter storm is **high** (which is the same as the County's rating) and that their vulnerability to winter storm is **moderate** (which is lower than the County's rating). *These ratings have not changed since the previous version of the NHMP.*

Volume I, Section 2 describes the characteristics of winter storm hazards, history, and how they relate to future climate projections (see [OCCRI report](#)), as well as the location, extent, and probability of a potential event within the region. 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 Falls City area and while they typically do not cause significant damage, they are frequent and have the potential to impact economic activity. Road closures on major roads due to winter weather are an uncommon occurrence but can interrupt commuter and large truck traffic.

## Vulnerability Assessment

Due to insufficient data and resources, Falls City is currently unable to perform a quantitative risk assessment, or exposure analysis, for the extreme heat, windstorm, and winter storm hazards. For a list of facilities and infrastructure vulnerable to these hazards see the Community Assets Section.

According to the previous version of this plan all areas within Falls City are at risk from a windstorm event. Including, approximately 395 residential structures (value \$47M), three government facilities (value \$1.2M), one emergency response facility (value \$1.2M), two educational facilities (value \$1.7M), ten community facilities (value \$886K), three bridges (value \$2.2M), and two utilities (value \$8.4M) are impacted by severe weather.<sup>18</sup>

## Future Projections

According to the Oregon Climate Change Research Institute ([OCCRI report](#)) "Future Climate Projections, Polk County,"<sup>19</sup> cold extremes will become less frequent and intense as the climate warms. The number of cold days (maximum temperature 32°F or lower) per year in Polk County is projected to decrease by an average of 1 (range -1.4–0.3) by the 2050s, relative to the 1971–2000 historical baselines, under the higher emissions scenario. The temperature on the coldest night of the year is projected to increase by an average of 5°F (range 0–10°F) by the 2050s. The number of county residents vulnerable to extreme cold is

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<sup>18</sup> URS, 2009 Polk County Natural Hazards Mitigation Plan; values are in 2009 dollars.

<sup>19</sup> Oregon Climate Change Research Institute, *Future Climate Projections, Polk County, Oregon*. May 2023.



likely to grow, although this increase may be offset somewhat by the decrease in incidence of cold extremes.

## Volcanic Event

The steering committee determined that the City's probability for a volcanic event is **low** (which is the same as the County's rating) and that their vulnerability to a volcanic event is **low** (which is the same as the County's rating). *These ratings have not changed since the previous version of the NHMP.*

Volume I, Section 2 describes the characteristics of volcanic hazards and their history, as well as the location, extent, and probability of a potential event within the region. Generally, an event that affects the County is likely to affect Falls City as well. Falls City 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.

### Vulnerability Assessment

Due to Falls City's relative distance from volcanoes, the city is unlikely to experience the immediate effects that eruptions have on surrounding areas (i.e., mud and debris flows, or lahars). Depending on wind patterns and which volcano erupts, however, the city may experience ashfall. The eruption of Mount St. Helens in 1980, for example, coated the Willamette Valley with a fine layer of ash. If Mount Hood erupts, however, the city could experience a coating of ash.

### Future Projections

Although the science of volcano predictions is improving, it remains challenging to predict a potential volcanic event. Ash fall, which will be the greatest impact, will impact the entire County. Impacts will be felt hardest by property managers (ranches, farmers, etc.) and by those relying upon clean surface water (for drinking water production and irrigation).

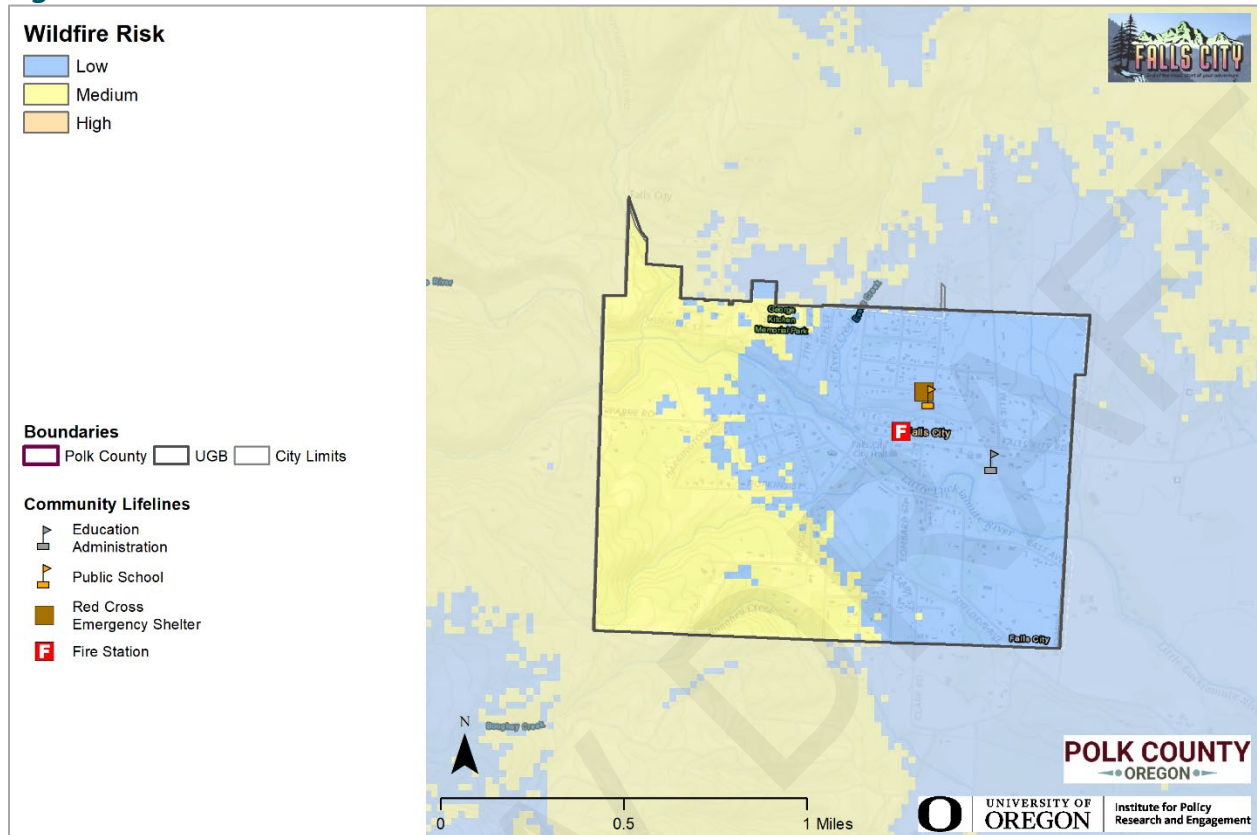
## Wildfire

The steering committee determined that the City's probability for wildfire is **high** (which is the same as the County's rating) and that their vulnerability to wildfire is **moderate** (which is the same as the County's rating). *These ratings have increased since the previous version of the NHMP.*

Volume I, Section 2 describes the characteristics of wildfire hazards, history, and how they relate to future climate projections (see [OCCRI report](#)), as well as the location, extent, and probability of a potential event within the region. The location and extent of a potential wildfire vary depending on fuel, topography, and weather conditions. Weather and urbanization conditions are primarily at cause for the hazard level. Wildfires near Falls City are common.

Figure FC-8 shows wildfire risk in Falls City.

Figure FC-8 Wildfire Risk



Source: Oregon Partnership for Disaster Resilience. USFS Pacific Northwest Region Wildfire Risk Assessment (PNRA)  
Note: To view detail click this [link](#) to access Oregon Explorer's CWPP Planning Tool.

The potential community impacts and vulnerabilities described in Volume I, Section 2 are generally accurate for the City as well. The [Polk County Community Wildfire Protection Plan](#) (CWPP, updated 2017) assesses wildfire risk, maps wildland urban interface areas, and includes actions to mitigate wildfire risk. The City is included in the CWPP and will update the City's wildfire risk assessment if the fire plan presents better data during future updates (an action item is included within Volume I, Section 4 to participate in updates to the integrated fire plan and to continue to maintain and update their CWPP). The City hereby incorporates the CWPP into this addendum by reference to provide greater detail to sensitivity and exposure to the wildfire hazard.

Forestland surrounds much of Falls City, particularly to the west. The city also includes a forestry zoning designation within the city.

Property can be damaged or destroyed with one fire as structures, vegetation, and other flammables easily merge to become unpredictable and hard to manage. Other factors that affect ability to effectively respond to a wildfire include access to the location and to water, response time from the fire station, availability of personnel and equipment, and weather (e.g., heat, low humidity, high winds, and drought).

### Vulnerability Assessment

Due to insufficient data and resources, Falls City is currently unable to perform a complete quantitative risk assessment, or exposure analysis, for this hazard. Identified community lifelines that are exposed to this hazard are shown in Figure FC-3. Note that even if a facility has exposure, *it does not mean there is a high risk (vulnerability)*.

### Natural Hazard Risk Report<sup>20</sup>

In 2024, DOGAMI created a Risk Report (O-24-XX) for Polk County that provides hazard analysis summary tables that identify populations and property that are vulnerable to the wildfire hazard. Identified community lifelines that are exposed to this hazard are shown in Table FC-4. No development changes affected the jurisdiction's overall vulnerability to this hazard. Loss estimates for wildfire events in the city are shown below:

There are 88 buildings (no critical facilities) exposed to the high and moderate wildfire hazard risk zones. These structures represent a building replacement value of \$14 million (14% of total building replacement value). In addition, there is the potential for 168 residents to be displaced (16% of the population).

### Future Projections

According to the Oregon Climate Change Research Institute "Future Climate Projections, Polk County,"<sup>21</sup> Wildfire frequency and intensity and area burned are projected to continue increasing in the Northwest. Wildfire risk, expressed as the average number of days per year on which fire danger is very high, is projected to increase in Polk County by 11 days (range -7–28) by the 2050s, relative to the historical baseline, under the higher emissions scenario. The average number of days per year on which vapor pressure deficit is extreme is projected to increase by 25 (range 8–42) by the 2050s. Communities will need to address growing wildfire risks if populations are not restricted from expanding further into higher risk areas.

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<sup>20</sup> DOGAMI, Multi-Hazard Risk Report for Polk County, Oregon (O-24-XX, February 2024), Table A-12.

<sup>21</sup> Oregon Climate Change Research Institute, *Future Climate Projections, Polk County, Oregon*. May 2023.

# Appendix A:

## Public Involvement Summary

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Members of the steering committee provided edits and updates to the NHMP prior to the public review period as reflected in the final document. In addition, a written and online Hazard Awareness survey was distributed that included responses from 144 people (including 11 residents of Falls City) (Volume II, Appendix F).

To provide the public information regarding the draft NHMP addendum, and provide an opportunity for comment, an announcement (see below) was provided from **April XX and** through the FEMA review period on the City's website. The plan was also posted and announced on the County's website. There were **XX [to be updated following public comment period]** comments provided. Additional opportunities for stakeholders and the public to be involved in the planning process are addressed in Volume II, Appendix B.

The Falls City NHMP Steering Committee held one public meeting during the development of the plan. This meeting was advertised in the City's newsletter, on their website, and via email to stakeholders.

Stakeholder participation was encouraged through one-on-one briefings and interviews. Stakeholder agencies not directly represented on the CAC or NHMP Steering Committee were also included in all meeting follow-ups to provide opportunities to provide comments on draft goals, hazard assessments, mitigation actions, and plan products.

### **Hazard Survey**

Volume I, Appendix F contains the findings, methodology, and full report of a household hazard preparedness survey taken in Polk County in the summer of 2023. Eleven of the 144 respondents to the survey, which was distributed online and in person at various events around Polk County, were residents of Falls City. Survey findings were reviewed and incorporated into the mitigation strategy by the Steering Committee.

# Website Posting

To be provided

REVIEW DRAFT

## Falls City Steering Committee

Falls City convened a Natural Hazard Mitigation Plan Steering Committee, which included representatives from City departments associated with preventive measures, property protection, natural resource protection, emergency services, structural flood control, and public information. The Falls City Steering Committee was also represented on the Polk County NHMP Steering Committee.

Steering committee members possessed familiarity with Falls City's community and how it is affected by natural hazard events. The steering committee guided the Falls City update process through several steps including hazard assessment, problem identification, goal confirmation and prioritization, action item review and development, and information sharing, to update the NHMP and to make the NHMP as comprehensive as possible.

Based on their involvement in hazard mitigation projects or planning, and/or their interest as a neighboring jurisdiction, representatives from the following agencies were invited to participate in the NHMP update and reviewed drafts of the plan, providing feedback by email.

Other Government and Stakeholder Representatives:

- NW Natural Gas
- Pacific Power and Light
- Polk County Fire District No. 1
- Southwestern Polk County Fire District
- Polk County Emergency Services
- Oregon Department of Transportation District No. 2
- Central School District 13J
- Mid Willamette Council of Governments

Stakeholders were included in the planning process. Unlike the Steering Committee, stakeholders for the update were not included in all stages of the planning process, but their input was included to inform the Steering Committee and provide additional perspectives from the community.

### **Falls City steering committee, December 12, 2023 (via Zoom)**

During this meeting, a representative from the steering committee reviewed the previous NHMP, and was provided updates on hazard mitigation planning, the NHMP update process, and project timeline. The steering committee:

- Updated recent history of hazard events in the city.
- Reviewed and confirmed the County NHMP's mission and goals.
- Discussed the NHMP public outreach strategy.
- Reviewed and added to Community Lifelines and list of essential facilities.
- Reviewed and provided feedback on the draft risk assessment update including community vulnerabilities and hazard information.
- Reviewed and updated their existing mitigation strategy (actions).
- Reviewed and updated their implementation and maintenance program.

Meeting Attendees:

- AJ Foscoli, City Manager

# Attachment B: Action Item Changes

Table FC-6 is an accounting of the status (complete or not complete) and major changes to actions since the previous NHMP. All actions were renumbered in this update to be consistent with other jurisdictions that are participating in the multi-jurisdictional NHMP. Actions identified as still relevant are included in the updated action plan (Table FC-1).

**Table FC-6 Status of All Hazard Mitigation Actions in the Previous Plan**

2017 Action Item	2023 Action Item	Status	Still Relevant? (Yes/No)
<b>Multi-Hazard Mitigation Items</b>			
MH #1	1	Not Complete	Yes
MH #2	2	Not Complete	Yes
MH #3	3	Not Complete	Yes
<b>Earthquake Mitigation Items</b>			
EQ #1	4	Not Complete	Yes
EQ #2	5	Not Complete, funding not yet secured	Yes
EQ #3	6	Not Complete	Yes
EQ #4	7	Not Complete, funding not yet secured	Yes
EQ #5	8	Not Complete, funding not yet secured	Yes
<b>Flood Mitigation Items</b>			
FL #1	9	Not Complete	Yes
FL #2	10	Not Complete	Yes
FL #3	11	Not Complete	Yes
FL #4	12	Not Complete	Yes
FL #5	13	Not Complete	Yes
FL #6	14	Not Complete, funding not yet secured	Yes
<b>Landslide Mitigation Items</b>			
LS #1	15	Not Complete	Yes
LS #2	16	Not Complete	Yes
<b>Volcano Mitigation Items</b>			
VE #1	17	Not Complete	Yes
VE #2	18	Not Complete	Yes
<b>Wildfire Mitigation Items</b>			
WF #1	19	Not Complete, Annual Clean-up Day with Republic Services	Yes

2017 Action Item	2023 Action Item	Status	Still Relevant? (Yes/No)
WF #2	20	Not Complete	Yes
WF #3	21	Not Complete	Yes
WF #4	22	Not Complete	Yes
WF #5	23	Not Complete, funding not yet secured	Yes
<b>Severe Weather Mitigation Items</b>			
WD #1	24	Not Complete	Yes
WT #1	25	Not Complete	Yes
WT #2	26	Not Complete	Yes

REVIEW DRAFT