

Yamhill County Multi-Jurisdictional Hazard Mitigation Plan

Yamhill County and the Cities of:
Amity, Carlton, Dayton, McMinnville,
Newberg, Sheridan, Willamina, and Yamhill



Photo Credit: Gary Halvorson, Oregon State Archives

Effective:

December 22, 2020 through December 21, 2025



Prepared for:

Yamhill County Emergency Management

Prepared by:

University of Oregon
Institute for Policy Research and Engagement
Oregon Partnership for Disaster Resilience



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This Natural Hazard Mitigation Plan was prepared by:



With support from:



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Policy and Management

Institute for Policy
Research and Engagement

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SPECIAL THANKS & ACKNOWLEDGEMENTS

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Special thanks to Brian Young, Yamhill County Emergency Manager for his vision, passion, and positive outlook throughout the plan update process.

Hazard Mitigation Advisory Committee

County Departments

- County Convener, Brian Young, Emergency Manager, Yamhill County
- Carol Ann Harlan, Emergency Management Technician, Yamhill County
- Mike Kemper, Code Enforcement, Yamhill County
- Paul Myatt, Public Health Specialist, Yamhill County
- Malachi Nelson, Public Health Preparedness VISTA, Yamhill County
- Ken Nygren, Assistant Emergency Manager, Yamhill County
- Steve Sims, Road Supervisor, Yamhill County
- Mary Starrett, Yamhill County Board of Commissioners
- Gary Van Der Veen, Environmental Health Specialist, Yamhill County
- Matt Vogt, Assistant Planner, Yamhill County

Special District Steering Committee Members

- John Dietz, General Manager, McMinnville Water and Light
- James Burke, Water Division Director, McMinnville Water and Light
- Scott Rosenbalm, Electric Division Manager, McMinnville Water and Light
- Damon Schulze, Deputy Chief, Sheridan/West Valley Rural Fire Districts
- Steven Sugg, Superintendent, Sheridan School District

City Steering Committee Members

Amity

- Convener, Michael Thomas, City Administrator
- Gary Mathis, Public Works Superintendent
- Scott Law, Chief Amity Fire District
- Jeff Clark, Amity Public Schools Superintendent

Carlton

- Convener, Aimee Amerson, Community and Economic Development Coordinator
- Kevin Martinez, Police Chief
- Dennis Durham, City Manager
- Bryan Burnham, Public Works Director
- Christy Martinez, Director of Administrative Services

Dayton

- Convener, Rochelle Roaden, City Manager
- Steve Sagmiller, Public Works Director

McMinnville

- Convener, Mike Bisset, Community Development Director
- Jenny Berg, Library Director
- James Burke, McMinnville Water & Light, Water Division Director
- Scott Burke, Information Technology Director
- John Dietz, McMinnville Water & Light, General Manager
- David Koch, City Attorney
- Leland Koester, Wastewater Services Manager
- Rich Leipfert, Fire Chief
- David Renshaw, Superintendent
- Heather Richards, Planning Director
- Scott Rosenbalm, McMinnville Water & Light, Electric Division Director
- Matt Scales, Chief of Police
- Larry Sherwood, Engineering Technician and Inspector
- Jeff Towery, City Manager

Newberg

- Convener, Jay Harris, Public Works Director (*former*)
- Karen Tarmichael, Project Specialist
- Dan Weinheimer, City Manager

Sheridan

- Convener, Frank Sheridan, City Manager
- Jim Anderson, Public Works Director
- Laury Hall, Public Works Clerk
- Damon Schulze, Deputy Chief, Sheridan/West Valley Rural Fire Districts
- Steven Sugg, Superintendent, Sheridan School District

Willamina

- Convener, Kenna West, City Manager

Yamhill

- Convener, Lori Gilmore, City Recorder/Emergency Coordinator
- Mayor, Yvette Potter

- Police Chief, Greg Graven
- Public Works Superintendent, Bernard Malis
- Fire Chief, Brian Jensen
- Committee Member, Jay Disbrow, Council-President
- Yamhill-Carlton School District Superintendent, Charan Kline

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- Michael Howard, Assistant Program Manager
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To the Department of Geology and Mineral Industries for assistance with hazard data; the Department of Land Conservation and Development staff in the hazards for flood data, mapping and process support; to the Oregon Office of Emergency Management for grant administration and process support.

About the Institute for Policy Research and Engagement

The Institute for Policy Research and Engagement (IPRE), a research center affiliated with the School of Planning, Public Policy and Management at the University of Oregon, is an interdisciplinary organization that assists Oregon communities by providing planning and technical assistance to help solve local issues and improve the quality of life for Oregon residents. The role of the IPRE is to link the skills, expertise and innovation of higher education with the transportation, economic development and environmental needs of communities and regions in the State of Oregon, thereby providing service to Oregon and learning opportunities to the students involved.

About the Oregon Partnership for Disaster Resilience

The Oregon Partnership for Disaster Resilience (OPDR) is a coalition of public, private and professional organizations working collectively toward the mission of creating a disaster-resilient and sustainable state. Developed and coordinated by the Institute for Policy Research and Engagement at the University of Oregon, the OPDR employs a service-learning model to increase community capacity and enhance disaster safety and resilience statewide.

NHMP Template Disclaimer

This NHMP is based in part on a plan template developed by the Oregon Partnership for Disaster Resilience. The template is structured to address the requirements contained in 44 CFR 201.6; where language is applicable to communities throughout Oregon, OPDR encourages the use of standardized language. As part of this regional planning initiative, OPDR provided copies of the plan templates to communities for use in developing or updating their hazards mitigation plans. OPDR hereby authorizes the use of all content and language provided to Yamhill County in the plan template.

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FEMA

January 20, 2021

The Honorable Casey Kulla
Chair Kulla, Yamhill County Board of Commissioners
535 NE 5th St.
McMinnville, Oregon 97128

Dear Chair Kulla:

On December 22, 2020, the U.S. Department of Homeland Security's Federal Emergency Management Agency (FEMA) Region 10, approved the Yamhill County Hazard Mitigation Plan as a multi-jurisdictional local plan as outlined in Code of Federal Regulations Title 44 Part 201. This approval provides the below jurisdictions eligibility to apply for the Robert T. Stafford Disaster Relief and Emergency Assistance Act's, Hazard Mitigation Assistance grants projects through December 21, 2025, through your state:

Yamhill County	City of Amity	City of Carlton	City of Dayton
City of McMinnville	City of Newberg	City of Sheridan	City of Yamhill

FEMA individually evaluates all application requests for funding according to the specific eligibility requirements of the applicable program. Though a specific mitigation activity or project identified in the plan may meet the eligibility requirements, it may not automatically receive approval for FEMA funding under any of the aforementioned programs.

Approved mitigation plans may be eligible for points under the National Flood Insurance Program's Community Rating System (CRS). For additional information regarding the CRS, please visit: www.fema.gov/national-flood-insurance-program-community-rating-system or contact your local floodplain manager. Over the next five years, we encourage your communities to follow the plan's schedule for monitoring and updating, and to develop further mitigation actions. To continue eligibility, jurisdictions must review, revise as appropriate, and resubmit the plan within five years of the original approval date.

If you have questions regarding your plan's approval or FEMA's mitigation grant programs, please contact Joseph Murray, Planner with Oregon Office of Emergency Management, at (503) 378-2911, who locally coordinates and administers these efforts.

Sincerely,

Kristen Meyers, Director
Mitigation Division

Enclosure

cc: Amie Bashant, Oregon Office of Emergency Management

EG:vl

IN THE BOARD OF COMMISSIONERS OF THE STATE OF OREGON

FOR THE COUNTY OF YAMHILL

SITTING FOR THE TRANSACTION OF COUNTY BUSINESS

In the Matter of a Resolution Adopting Updates)
To the Yamhill County Multi-Jurisdictional) RESOLUTION 20-11-12-1
Natural Hazards Mitigation Plan)

WHEREAS, Yamhill County recognizes the threat that natural hazards pose to people, property and infrastructure within our community; and

WHEREAS, undertaking hazard mitigation actions will reduce the potential for harm to people, property, and infrastructure from future hazard occurrences; and

WHEREAS, an adopted Natural Hazards Mitigation Plan (NHMP) is required as a condition of future funding for mitigation projects under multiple FEMA pre- and post-disaster mitigation grant programs; and

WHEREAS, the Oregon Office of Emergency Management and Federal Emergency Management Agency Region X officials have reviewed the Yamhill County Multi-Jurisdictional Natural Hazard Mitigation Plan and pre-approved it (dated September 10, 2020), contingent upon this official adoption of the participating governments and entities; and

WHEREAS, the NHMP is comprised of three volumes: Volume I: Basic Plan, Volume II: Jurisdictional Addenda, and Volume III: Appendices, collectively referred to herein as the NHMP; and

WHEREAS, the NHMP is in an ongoing cycle of development and revision to improve its effectiveness; and

NOW, THEREFORE, LET IT BE RESOLVED, that Yamhill County adopts the Yamhill County Multi-Jurisdictional Natural Hazards Mitigation Plan as an official plan

BE IT FURTHER RESOLVED, that Yamhill County will submit this Adoption Resolution to the Oregon Office of Emergency Management and Federal Emergency Management Agency Region X officials to enable final approval of the *Yamhill County Multi-Jurisdictional Natural Hazards Mitigation Plan*.

Done this 12th day of November, 2020.



YAMHILL COUNTY BOARD OF COMMISSIONERS

Handwritten signature of Casey Kulla in black ink.

Commissioner Chair

CASEY KULLA

Handwritten signature of Mary Starrett in black ink.

Commissioner, Vice-Chair

MARY STARRETT

Handwritten signature of Richard L. Olson in black ink.

Commissioner

RICHARD L. "RICK" OLSON

Accepted by Yamhill County
Board of Commissioners on
11/12/2020 by Board Order
20-412

PLAN SUMMARY

Yamhill County updated this Multi-Jurisdictional Natural Hazards Mitigation Plan (NHMP) to prepare for the long-term effects resulting from hazards. It is impossible to predict exactly when these hazards will occur, or the extent to which they will affect the community. However, with careful planning and collaboration among public agencies, private sector organizations and citizens within the community, it is possible to create a resilient community that will benefit from long-term recovery planning efforts.

FEMA defines mitigation as “. . . the effort to reduce loss of life and property by lessening the impact of disasters . . . through risk analysis, which results in information that provides a foundation for mitigation activities that reduce risk.” Said another way, hazard mitigation is a method of permanently reducing or alleviating the losses of life, property and injuries resulting from hazards through long and short-term strategies. Example strategies include policy changes, such as updated ordinances, projects, such as seismic retrofits to critical facilities; and education and outreach to targeted audiences, such as non-English speaking residents or the elderly. Hazard mitigation is the responsibility of the “Whole Community.” FEMA defines Whole Community as, “private and nonprofit sectors, including businesses, faith-based and disability organizations and the public, in conjunction with the participation of local, tribal, state, territorial and Federal governmental partners.”

44 CFR 201.6 – The local mitigation plan is the representation of the jurisdiction’s commitment to reduce risks from natural hazards, serving as a guide for decision makers as they commit resources to reducing the effects of natural hazards. . . .

Why Develop this Mitigation Plan?

The Disaster Mitigation Act of 2000 (DMA2K) and the regulations contained in 44 CFR 201 require that jurisdictions maintain an approved NHMP in order to receive FEMA Hazard Mitigation Assistance (HMA) funds for mitigation projects. To that end, Yamhill County is involved in a broad range of hazard and emergency management planning activities. Local and federal approval of this NHMP ensures that the County and listed jurisdictions will (1) remain eligible for pre- and post-disaster mitigation project grants and (2) promote local mechanisms to accomplish risk reduction strategies.

44 CFR 201.6(a)(1) – A local government must have a mitigation plan approved pursuant to this section in order to receive HMGP project grants . . .

What is Mitigation?

“Any sustained action taken to reduce or eliminate long-term risk to life and property from a hazard event.”

- U.S. Federal Emergency Management Agency

Who Participated in Developing the Plan?

The Yamhill County NHMP is the result of a collaborative effort between the County, cities, special districts, citizens, public agencies, non-profit organizations, the private sector and regional organizations. County, city, and special district Steering Committees guided the NHMP development process.

For a list of specific County steering committee participants, refer to the acknowledgements section above. The update process included representatives from the following jurisdictions and agencies:

<u>County Departments</u>	<u>Participating Cities</u>	<u>Other</u>
Board of County Commissioners	City of Amity	Sheridan School District
Emergency Management	City of Dayton	Sheridan Fire/West Valley Fire
Planning	City of McMinnville	Tualatin Valle Fire & Rescue
Public Health	McMinnville Water & Light	
Public Works	McMinnville Fire	
	City of Newberg	
	City of Sheridan	
	City of Willamina	
	City of Yamhill	

44 CFR 201.6(c)(1) – Documentation of the planning process used to develop the plan, including how it was prepared, who was involved in the process and how the public was involved.

The Yamhill County Emergency Manager convened the planning process and will take the lead in implementing, maintaining and updating the County NHMP. Each of the participating cities and special districts have also named a local convener who is responsible for implementing, maintaining and updating their Jurisdictional Addendum (see addenda for specific names and positions). Yamhill County is dedicated to directly involving the public in the continual review and update of the NHMP. The County achieves this through systematic engagement of a wide variety of active groups, organizations or committees, public and private infrastructure partners, watershed and neighborhood groups and numerous others. Although members of the steering committee represent the public to some extent, the public will continue to provide feedback about the NHMP throughout the implementation and maintenance period.

How Does this NHMP Reduce Risk?

The NHMP is intended to assist Yamhill County reduce the risk from hazards by identifying resources, information and strategies for risk reduction. It is also intended to guide and coordinate mitigation activities throughout the County. A risk assessment consists of three

44 CFR 201.6(c)(2) – A Risk Assessment that provides the factual basis for activities proposed in the strategy

...

phases: hazard identification, vulnerability assessment and risk analysis, as illustrated in Figure PS-1.

By identifying and understanding the relationship between hazards, vulnerable systems and existing capacity, Yamhill County is better equipped to identify and implement actions aimed at reducing the overall risk to hazards.

Figure PS-1 Understanding Risk



What is Yamhill County’s Overall Risk to Hazards?

Yamhill County reviewed and updated the risk assessment to evaluate the probability of each hazard as well as the vulnerability of the community to that hazard. Table PS-1 summarizes hazard probability and vulnerability as determined by the County steering committee (for more information see Volume I, Section 2).

Table PS-1 Hazard and Vulnerability Assessment Summary

Hazard	Maximum				Total Threat Score	Hazard Rank	Hazard Tiers
	History	Vulnerability	Threat	Probability			
Flood	18	40	90	63	211	#1	Top Tier
Winter Storm	16	40	80	56	192	#2	
Earthquake - Cascadia	6	45	100	35	186	#3	
Drought	8	25	80	56	169	#5	Middle Tier
Windstorm	16	25	70	56	167	#6	
Wildfire	8	15	80	21	124	#7	
Landslide	16	15	30	56	117	#8	Bottom Tier
Earthquake - Crustal	6	20	60	21	107	#9	
Volcanic Event	4	10	30	7	51	#10	

Source: Yamhill County NHMP Steering Committee, 2019

What is the NHMP’s Mission?

The mission of the Yamhill County NHMP is to:

“To promote public policy and mitigation activities which will enhance the safety to life and property from natural hazards.”

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

What are the NHMP Goals?

The plan goals describe the overall direction that the participating jurisdiction's agencies, organizations and citizens can take toward mitigating risk from all-hazards. The goals of the Yamhill County NHMP are organized under several broad categories. The goals are:

44 CFR 201.6(c)(3)(i) – A description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards.

GOAL 1: EMERGENCY OPERATIONS

- Coordinate natural hazard mitigation activities, where appropriate, with emergency operations plans and procedures and with other agencies.

GOAL 2: EDUCATION AND OUTREACH

- Develop and implement education and outreach programs to increase public awareness of the risks associated with natural hazards.

GOAL 3: PARTNERSHIPS

- Develop effective partnerships with public and private sector organizations and significant agencies and businesses for future natural hazard mitigation efforts.
- Coordinate natural hazard mitigation actions between the County and local jurisdictions to create more cohesive and effective hazard mitigation efforts.

GOAL 4: PREVENTATIVE

- Develop and implement activities to protect human life, commerce, and property from natural hazards.
- Reduce losses and repetitive damage for chronic hazard events while promoting insurance coverage for catastrophic hazards.

GOAL 5: NATURAL RESOURCE UTILIZATION

- Link natural resources management, land use planning, and watershed planning with natural hazard mitigation activities to protect natural systems and allow them to serve natural hazard mitigation functions.

GOAL 6: IMPLEMENTATION

- Implement strategies to mitigate the effects of natural hazards and increase the quality of life and resilience of economies in Yamhill County.

GOAL 7: DEVELOPMENT

- Communities appropriately apply development standards that consider the potential impacts of natural hazards.

GOAL 8: DOCUMENTATION

- Document and evaluate progress in achieving hazard mitigation strategies and action items.

How are the Action Items Organized?

The action items are organized within an action matrix included within Section 3, Mitigation Strategy.

Data collection, research and the public participation process resulted in the development of the action items. The Action Item Matrix portrays the plan framework and identifies linkages between the plan goals and actions. The matrix documents the title of each action along with, the coordinating organization, timeline and the NHMP goals addressed. City and special district specific action items are included in Volume II, Jurisdictional Addenda.

44 CFR 201.6(c)(3)(ii) – A section that identifies and analyzes a comprehensive range of specific mitigation actions . . .

Comprehensive Action Plan

Action items are detailed recommendations for activities that local departments, citizens, and others could engage in to reduce risk. The Steering Committee will prioritize the following actions to focus their attention, and resource availability, upon an achievable set of high leverage activities over the next five-years.

44 CFR 201.6(c)(3)(iii) – An action plan describing how the actions . . . will be prioritized, implemented and administered . . .

44 CFR 201.6(c)(4) – A plan maintenance process . . .

- **Multi-Hazard #1:** Develop, produce, and distribute public education and information materials concerning mitigation, preparedness and safety procedures for identified natural hazards.
- **Multi-Hazard #5:** Develop public and private partnerships to foster natural hazard mitigation program coordination and collaboration in Yamhill County such as MOUs and CPODS etc.
- **Multi-Hazard #6:** Develop a long-term recovery plan for Yamhill County from the effects of natural hazards.
- **Multi-Hazard #8:** Train elected officials and recorders in small towns who have no emergency management background on hazard mitigation needs.
- **Earthquake #1:** Conduct seismic strength evaluations of critical facilities and infrastructure to identify vulnerabilities and seismically retrofit (structural and nonstructural) identified critical facilities and infrastructure to meet life safety standards in order to continue operations post-earthquake.
- **Landslide #1:** Use DOGAMI landslide risk maps to improve public knowledge of landslide hazard areas and understanding of vulnerability and risk to life and property in hazard-prone areas in Yamhill County.
- **Wildfire #1:** Coordinate wildfire mitigation action items through the Yamhill County Community Wildfire Protection Plan.
- **Wildfire #4:** Improve fire identification data collection and reporting to enhance emergency response and evacuation procedures.

How will the NHMP be implemented?

The implementation and maintenance section (Section 4) details the formal process that will ensure that the Yamhill County NHMP remains an active and relevant document. The Yamhill County Emergency Manager is the designated convener (NHMP Convener) and is responsible for overseeing the review and implementation processes (see jurisdictional addenda for city and special district conveners). The NHMP maintenance process includes a schedule for monitoring and evaluating the NHMP semi-annually and revising the NHMP every five years. This section also describes how the communities will integrate public participation throughout the implementation and maintenance process.

The accomplishment of the NHMP goals and actions depends upon regular steering committee participation and adequate support from County, city, and special district leadership. Comprehensive familiarity with this NHMP will result in the efficient and effective implementation of appropriate mitigation activities and a reduction in the risk and the potential for loss from future natural hazard events.

NHMP Adoption

Once the NHMP is locally reviewed and deemed complete the NHMP Convener (or their designee) submits it to the State Hazard Mitigation Officer at the Oregon Office of Emergency Management (OEM). OEM reviews the NHMP and submits it to FEMA Region X for pre-approval. This review will address the federal criteria outlined in [44 CFR Part 201.6](#). Once pre-approved by FEMA, the County, cities, and special districts may formally adopt it via resolution.

The Yamhill County NHMP Convener will be responsible for ensuring local adoption of the NHMP and providing the support necessary to ensure NHMP implementation. Once the resolution is executed at the local level and documentation is provided to FEMA, the NHMP will be formally approved by FEMA and the County, participating cities, and special districts will regain eligibility for Hazard Mitigation Assistance (HMA) grant programs

The steering committees for Yamhill County and participating cities each met to review the NHMP update process and their governing bodies adopted the NHMP as shown below and in Volume II.

44 CFR 201.6(c)(5) – Documentation that the plan has been formally adopted by the governing body of the jurisdiction . . .

44 CFR 201.6(d) – Plan review [process] . . .

County Date of Adoption and Approval

Yamhill County adopted the NHMP on **November 12, 2020**

FEMA Region X approved the Yamhill County NHMP on **December 22, 2020**. With approval of this NHMP, the entities listed above are now eligible to apply for the Robert T. Stafford Disaster Relief and Emergency Assistance Act's hazard mitigation project grants through **December 21, 2025**.

For the date of adoption for each participating City or special district see Volume II.

**Volume I:
Basic Plan**

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SECTION I: INTRODUCTION

This section provides a general introduction to natural hazard mitigation planning in Yamhill County. In addition, it addresses the planning process requirements contained in 44 CFR 201.6(b) thereby meeting the planning process documentation requirement contained in 44 CFR 201.6(c)(1). The section concludes with a general description of how the NHMP is organized.

What is Natural Hazard Mitigation?

The Federal Emergency Management Agency (FEMA) defines mitigation as “. . . the effort to reduce loss of life and property by lessening the impact of disasters . . . through risk analysis, which results in information that provides a foundation for mitigation activities that reduce risk.”¹ Said another way, natural hazard mitigation is a method of permanently reducing or alleviating the losses of life, property and injuries resulting from natural hazards through long and short-term strategies. Example strategies include policy changes, such as updated ordinances, projects, seismic retrofits to critical facilities and education and outreach to targeted audiences, such as Spanish speaking residents or the elderly. Natural hazard mitigation is the responsibility of the “Whole Community”; individuals, private businesses and industries, state and local governments and the federal government.

Engaging in mitigation activities provides jurisdictions (counties, cities, special districts, etc.) with many benefits, including reduced loss of life, property, essential services, critical facilities and economic hardship; reduced short-term and long-term recovery and reconstruction costs; increased cooperation and communication within the community through the planning process; and increased potential for state and federal funding for recovery and reconstruction projects.

Why Develop a Mitigation Plan?

Yamhill County updated this Multi-Jurisdictional Natural Hazard Mitigation Plan (NHMP) to reduce future loss of life and damage to property resulting from natural hazards. It is impossible to predict exactly when natural hazard events will occur, or the extent to which they will affect community assets. However, with careful planning and collaboration among public agencies, private sector organizations and citizens within the community, it is possible to minimize the losses that can result from natural hazards.

In addition to establishing a comprehensive community-level mitigation strategy, the Disaster Mitigation Act of 2000 (DMA2K) and the regulations contained in 44 CFR 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 County and listed cities will remain eligible for pre- and post-disaster mitigation project grants.

¹ FEMA, *What is Mitigation?* <http://www.fema.gov/what-mitigation>

What Federal Requirements Does This NHMP Address?

DMA2K is the latest federal legislation addressing mitigation planning. It reinforces the importance of mitigation planning and emphasizes planning for natural hazards before they occur. As such, this Act established the Pre-Disaster Mitigation (PDM) grant program and new requirements for the national post-disaster Hazard Mitigation Grant Program (HMGP). Section 322 of the Act specifically addresses mitigation planning at the state and local levels. State and local jurisdictions must have approved mitigation plans in place in order to qualify to receive post-disaster HMGP funds. Mitigation plans must demonstrate that State and local jurisdictions' proposed mitigation measures are based on a sound planning process that accounts for the risk to the individual and State and local jurisdictions' capabilities.

Chapter 44 Code of Federal Regulations (CFR), section 201.6, also requires a local government to have an approved NHMP in order to receive HMGP project grants.² Pursuant of Chapter 44 CFR, the NHMP planning processes shall include opportunity for the public to comment on the NHMP during review and the updated NHMP shall include documentation of the public planning process used to develop the NHMP.³ The NHMP update must also contain a risk assessment, mitigation strategy and a NHMP maintenance process that has been formally adopted by the governing body of the jurisdiction.⁴ Lastly, the NHMP must be submitted to the Oregon Office of Emergency Management (OEM) for initial review and then sent to FEMA for federal approval.⁵ Additionally, a recent change in the way OEM administers the Emergency Management Performance Grant (EMPG), which helps fund local emergency management programs, also requires a FEMA-approved NHMP.

What is the Policy Framework for Natural Hazards Planning in Oregon?

Planning for natural hazards is an integral element of Oregon's statewide land use planning program, which began in 1973. All Oregon cities and counties have comprehensive plans and implementing ordinances that are required to comply with the statewide planning goals. The challenge faced by state and local governments is to keep this network of local plans coordinated in response to the changing conditions and needs of Oregon communities.

Statewide land use planning Goal 7: Areas Subject to Natural Hazards calls for local plans to include inventories, policies and ordinances to guide development in or away from hazard areas. Goal 7, along with other land use planning goals, has helped to reduce losses from natural hazards. Through risk identification and the recommendation of risk-reduction actions, this NHMP aligns with the goals of the jurisdiction's Comprehensive Plan and helps each jurisdiction meet the requirements of statewide land use planning Goal 7.

The primary responsibility for the development and implementation of risk reduction strategies and policies lies with local jurisdictions. However, additional resources exist at the state and federal levels. Some of the key agencies in this area include OEM, Oregon Building Codes Division (BCD), Oregon Department of Forestry (ODF), Oregon Department of

² Code of Federal Regulations, Chapter 44. Section 201.6, subsection (a), 2015

³ *ibid*, subsection (b). 2015

⁴ *ibid*, subsection (c). 2015

⁵ *ibid*, subsection (d). 2015

Geology and Mineral Industries (DOGAMI) and the Department of Land Conservation and Development (DLCD).

How was the NHMP Developed?

The NHMP was developed by the Yamhill County NHMP Steering Committee and the Steering Committees for the participating jurisdictions (cities and special districts). The Yamhill County Steering Committee formally convened on two occasions to discuss and revise the NHMP. Each of the participating city and special district steering committees participated in the County NHMP update process. Steering Committee members contributed data and maps, reviewed and updated the community profile, risk assessment, action items, and implementation and maintenance plan.

An open public involvement process is essential to the development of an effective NHMP. To develop a comprehensive approach to reducing the effects of natural disasters, the planning process shall include opportunity for the public, neighboring communities, local and regional agencies, as well as, private and non-profit entities to comment on the NHMP during review.⁶ Yamhill County provided an accessible project website for the public to provide feedback on the draft NHMP: <https://www.co.yamhill.or.us/emergency-management>. In addition, Yamhill County provided a press release on their website to encourage the public to offer feedback on the NHMP update. The County, city, and special district websites continue to be a focal point for distribution natural hazard information using hazard viewers, emergency alerts, hazard preparation and annual natural hazard progress reports. In addition, the County administered a survey (see Appendix F) that was used to inform the content of, and prioritization, of action items.

How is the NHMP Organized?

Each volume of the NHMP provides specific information and resources to assist readers in understanding the hazard-specific issues facing county and city residents, businesses and the environment. Combined, the sections work in synergy to create a mitigation plan that furthers the community's mission to reduce or eliminate long-term risk to people and their property from hazards and their effects. This NHMP structure enables stakeholders to use the section(s) of interest to them.

Volume I: Basic Plan

Plan Summary

The NHMP summary provides an overview of the FEMA requirements, planning process and highlights the key elements of the risk assessment, mitigation strategy and implementation and maintenance strategy.

Section I: Introduction

The Introduction briefly describes the countywide mitigation planning efforts and the methodology used to develop the NHMP.

⁶ Code of Federal Regulations, Title 44. Section 201.6, subsection (b). 2015

Section 2: Hazard Identification and Risk Assessment

This section provides the factual basis for the mitigation strategies contained in Volume I, Section 3. (Additional information is included within Volume III, Appendix C, which contains an overall description of Yamhill County and the incorporated cities.) This section includes a brief description of community sensitivities and vulnerabilities. The Risk Assessment allows readers to gain an understanding of each jurisdiction's vulnerability and resilience to natural hazards.

A hazard summary is provided for each of the hazards addressed in the NHMP. The summary includes hazard history, location, extent, vulnerability, impacts and probability. This NHMP addresses the following hazards:

- Drought
- Earthquake
- Flood
- Landslide
- Volcanic Event
- Wildfire
- Windstorm
- Winter Storm

Additionally, this section provides information on each jurisdictions' participation in the National Flood Insurance Program (NFIP).

Section 3: Mitigation Strategy

This section documents the NHMP vision, mission, goals and actions (mitigation strategy) and describes the components that guide implementation of the identified actions. Actions are based on community sensitivity and resilience factors and the risk assessments in Volume I, Section 2 and Volume II.

Section 4: Plan Implementation and Maintenance

This section provides information on the implementation and maintenance of the NHMP. It describes the process for prioritizing projects and includes a suggested list of tasks for updating the NHMP, to be completed at the semi-annual and five-year review meetings.

Volume II: Jurisdictional Addenda

Volume II of the NHMP is reserved for any city or special district addenda developed through this multi-jurisdictional planning process. Each of the cities with a FEMA approved addendum went through an update to coincide with the county's update. As such, the five-year update cycle will be the same for the participating cities and the county.

The NHMP includes addenda for the following cities:

- Amity
- Dayton
- McMinnville
- Newberg
- Sheridan
- Willamina
- Yamhill

Note 1: The cities of Dundee and Lafayette are incorporated cities in Yamhill County that did not participate in this update of the NHMP, as such there are no addenda for these cities.

Note 2: Special districts may opt to develop an addendum during future versions of the NHMP. See acknowledgements for a list of special districts that participated in the development of this NHMP.

Volume III: Appendices

The appendices are designed to provide the users of the Yamhill County NHMP with additional information to assist them in understanding the contents of the NHMP and provide them with potential resources to assist with NHMP implementation.

Appendix A: Action Item Forms

This appendix contains the detailed action item forms for each of the mitigation strategies identified in this NHMP.

Appendix B: Planning and Public Process

This appendix includes documentation of all the countywide public processes utilized to develop the NHMP. It includes invitation lists, agendas and sign-in sheets of Steering Committee meetings as well as any other public involvement methods.

Appendix C: Community Profile

The community profile describes the County from several perspectives to help define and understand the region's sensitivity and resilience to natural hazards. The information in this section represents a snapshot in time of the current sensitivity and resilience factors in the region when the NHMP was updated.

Appendix D: Economic Analysis of Natural Hazard Mitigation Projects

This appendix describes the FEMA requirements for benefit cost analysis in natural hazards mitigation, as well as various approaches for conducting economic analysis of proposed mitigation activities.

Appendix E: Grant Programs and Resources

This appendix lists state and federal resources and programs by hazard.

Appendix F: Community Survey

This appendix includes the survey instrument and results from the community survey administered by OPDR and Yamhill County.

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SECTION 2: HAZARD IDENTIFICATION AND RISK ASSESSMENT

This section of the NHMP addresses 44 CFR 201.6(c)(2) - Risk Assessment. The Risk Assessment applies to Yamhill County and the city addenda included in the NHMP. We address city specific information where relevant. In addition, this section can assist with addressing Oregon Statewide Planning Goal 7 – Areas Subject to Natural Hazards.

We use the information presented in this section, along with community characteristics presented in Volume III, Appendix C to inform the risk reduction actions identified Volume I, Section 3. Figure 2-1 shows how we conceptualize risk in this NHMP. Ultimately, the goal of hazard mitigation is to reduce the area where hazards and vulnerable systems overlap.

Figure 2-1 Understanding Risk



Source: Oregon Partnership for Disaster Resilience.

What is a Risk Assessment?

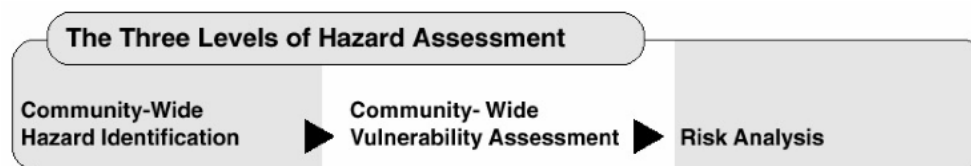
A risk assessment consists of three phases: hazard identification, vulnerability assessment and risk analysis.

- **Phase 1:** Identify hazards that can affect 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 following figure illustrates the three-phase risk assessment process:

Figure 2-2 Three Phases of a Risk Assessment



Source: Planning for Natural Hazards: Oregon Technical Resource Guide, 1998

This three-phase approach to developing a risk assessment should be conducted sequentially because each phase builds upon data from prior phases. However, gathering data for a risk assessment need not occur sequentially.

Hazard Identification

Yamhill County identifies eight natural hazards that could have an impact on the County and participating cities and special districts. Table 2-1 lists the hazards identified in the County in comparison to the hazards identified in the Oregon NHMP for the Mid/Southern Willamette Valley (Region 3), which includes Yamhill County.

Table 2-1 Yamhill County Hazard Identification

Yamhill County	State of Oregon NHMP Region 3: Mid/Southern Willamette Valley
Drought	Drought
Earthquake	Earthquake
Flood	Flood
Landslide	Landslide
Volcanic Event	Volcano
Wildfire	Wildfire
Windstorm	Windstorm
Winter Storm	Winter Storm

Source: Yamhill County NHMP Steering Committee (2019) and State of Oregon NHMP, Region 3: Mid/Southern Willamette Valley (2015)

Probability and Vulnerability Summary

Table 2-2 presents the probability scores for each of the natural hazards present in Yamhill County for which descriptions are provided herein. Probability assesses the likelihood that a hazard event will take place in the future. Vulnerability assesses the extent to which people are susceptible to injury or other impacts resulting from a hazard as well as the exposure of the built environment or other community assets (social, environmental, economic, etc.) to hazards. The exposure of community assets to hazards is critical in the assessment of the degree of risk a community has to each hazard. Identifying the populations, facilities and infrastructure at risk from various hazards can assist the County in prioritizing resources for

mitigation and can assist in directing damage assessment efforts after a hazard event has occurred. The exposure of County assets to each hazard and potential implications are explained in each hazard section.

Vulnerability includes the percentage of population and property likely to be affected under an “average” occurrence of the hazard. Yamhill County evaluated the best available vulnerability data to develop the vulnerability scores presented below.

Table 2-2 Probability and Vulnerability Assessment Summary

Hazard	Probability	Vulnerability
Drought	High	Moderate
Earthquake - Cascadia	Moderate	High
Earthquake - Crustal	Low	Moderate
Flood	High	High
Landslide	High	Low
Volcanic Event	Low	Low
Wildfire	Low	Low
Windstorm	High	Moderate
Winter Storm	High	High

Source: Yamhill County Steering Committee 2019.

Community vulnerabilities are an important component of the NHMP risk assessment. Changes to population, economy, built environment, critical facilities, and infrastructure have not significantly influenced vulnerability within the unincorporated County. New development has complied with the standards of the Oregon Building Code and the county’s development code including their floodplain ordinance. For more in-depth information regarding specific community vulnerabilities see Volume II and Volume III, Appendix C.

Hazard Analysis Matrix and Methodology

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 hazard.

For the purposes of this NHMP, the County, cities, and special districts utilized the Oregon Office of Emergency Management (OEM) Hazard Analysis methodology. The hazard analysis methodology in Oregon was first developed by FEMA circa 1983 and gradually refined by OEM over the years.

The methodology produces scores that range from 24 (lowest possible) to 240 (highest possible). Vulnerability and probability are the two key components of the methodology. Vulnerability examines both typical and maximum credible events and probability endeavors to reflect how physical changes in the jurisdiction and scientific research modify the historical record for each hazard. Vulnerability accounts for approximately 60% of the total score and probability approximately 40%. We include the hazard analysis summary here to ensure consistency between the EOP and NHMP.

The Oregon method provides the jurisdiction with a sense of hazard priorities, or relative risk. It doesn't predict the occurrence of a hazard, but it does "quantify" the risk of one

hazard compared with another. By doing this analysis, planning can first be focused where the risk is greatest.

In this analysis, severity ratings and weight factors, are applied to the four categories of history, vulnerability, maximum threat (worst-case scenario) and probability.

The hazard analysis matrix involves estimating the damage, injuries and costs likely to be incurred in a geographic area over time. Risk has two measurable components: (1) the magnitude of the harm that may result, defined through the vulnerability assessment (assessed in the previous sections) and (2) the likelihood or probability of the harm occurring.

Table 2-3 presents the updated hazard analysis matrix for Yamhill County. The hazards are listed in rank order from high to low. The table shows that hazard scores are influenced by each of the four categories combined. With considerations for past historical events, the probability or likelihood of a hazard event occurring, the vulnerability to the community and the maximum threat or worst-case scenario, flood, winter storm, and the Cascadia Subduction Zone earthquake rank as the top hazard threats to the County (top tier). Drought, windstorm, and wildfire events rank in the middle (middle tier). Landslides, crustal earthquake, and volcanic events comprise the lowest ranked hazards in the county (bottom tier).

Table 2-3 Hazard Analysis Matrix – Yamhill County

Hazard	Maximum				Total Threat Score	Hazard Rank	Hazard Tiers
	History	Vulnerability	Threat	Probability			
Flood	18	40	90	63	211	#1	Top Tier
Winter Storm	16	40	80	56	192	#2	
Earthquake - Cascadia	6	45	100	35	186	#3	
Drought	8	25	80	56	169	#5	Middle Tier
Windstorm	16	25	70	56	167	#6	
Wildfire	8	15	80	21	124	#7	
Landslide	16	15	30	56	117	#8	Bottom Tier
Earthquake - Crustal	6	20	60	21	107	#9	
Volcanic Event	4	10	30	7	51	#10	

Source: Yamhill County Steering Committee (2019)

Jurisdiction Specific Risk Assessment

Each participating jurisdiction (cities and special districts) in Yamhill County completed a jurisdiction specific hazard analysis that assessed each jurisdiction’s risks where they vary from the risks facing the entire planning area. The multi-jurisdictional risk assessment information is located within each jurisdiction’s addendum in Volume II.

Federal Disaster and Emergency Declarations

Reviewing past events can provide a general sense of the hazards that have caused significant damage in the county. Where trends emerge, disaster declarations can help inform hazard mitigation project priorities.

President Dwight D. Eisenhower approved the first federal disaster declaration in May 1953 following a tornado in Georgia. Since then, federally declared disasters have been approved

within every state because of natural hazard related events. As of December 2020, FEMA has approved a total of 35 major disaster declarations, 76 fire management assistance declarations and two (2) emergency declarations in Oregon.¹ When governors ask for presidential declarations of major disaster or emergency, they stipulate which counties in their state they want included in the declaration. Table 2-4 summarizes the major disasters declared in Oregon that affected Yamhill County, since 1955. The table shows that there have been 11 major disaster declarations for Yamhill County. Most of which were related to weather events resulting primarily in flooding, snow and landslide related damage. There has been one disaster declaration for earthquake (1993 Scott Mills).

Table 2-4 FEMA Major Disaster (DR) for Yamhill County

Declaration Number	Declaration Date	Incident Period		Incident	Individual Assistance	Public Assistance Categories
		From	To			
DR-184	12/24/1964	12/24/1964	12/24/1964	Heavy rains and flooding	Yes	A, B, C, D, E, F, G
DR-413	1/25/1974	1/25/1974	1/25/1974	Severe Storms, Snowmelt, Flooding	Yes	A, B, C, D, E, F, G
DR-985	4/26/1993	3/25/1993	3/25/1993	Earthquake	None	A, B, C, D, E, F, G
DR-1099	2/9/1996	2/4/1996	2/21/1996	Severe Storms/Flooding	Yes	A, B, C, D, E, F, G
DR-1107	3/19/1996	12/10/1995	12/12/1995	Severe Storms/High Winds	None	A, B, C, D, E, F, G
DR-1510	2/19/2004	12/26/2003	1/14/2004	Severe winter storms	None	A, B, C, D, E, F, G
DR-1632	3/20/2006	12/18/2005	1/21/2006	Severe storms, Flooding, Landslides, Mudslides	None	A, B, C, D, E, F, G
DR-1683	2/2/2007	12/14/2006	12/15/2006	Severe Winter Storm and Flooding	None	A, B, C, D, E, F, G
DR-1733	12/8/2007	12/1/2007	12/17/2007	Severe Storms, Flooding, Landslides, and Mudslides	None	A, B, C, D, E, F, G
DR-1824	3/2/2009	12/13/2008	12/26/2008	Severe Winter Storm, Record and Near Record Snow, Landslides, and Mudslides	None	A, B, C, D, E, F, G
DR-4258	2/17/2016	12/6/2015	12/23/2015	Oregon Severe Winter Storms, Straight-line Winds, Flooding, Landslides, and Mudslides	None	A, B, C, D, E, F, G

Source: FEMA, Oregon Disaster History. Major Disaster Declarations.

Table 2-5 summarizes fire management assistance and emergency declarations. Fire Management Assistance may be provided after a State submits a request for assistance to the FEMA Regional Director at the time a "threat of major disaster" for a fire emergency exists. There are no fire management assistance declarations or fire suppression authorizations on record for the county.

¹ FEMA, *Declared Disasters by Year or State*, <https://www.fema.gov/disasters/#>. . Accessed August 9, 2019.

An Emergency Declaration is more limited in scope and without the long-term federal recovery programs of a Major Disaster Declaration. Generally, federal assistance and funding are provided to meet a specific emergency need or to help prevent a major disaster from occurring. Yamhill County has two recorded Emergency Declarations related to the 1977 Drought and 2005 Hurricane Katrina evacuation.

Table 2-5 FEMA Fire Management (FM) and Emergency Declarations (EM) for Yamhill County

Declaration Number	Declaration Date	Incident Period		Incident	Individual Assistance	Public Assistance Categories
		From	To			
EM-3228	9/7/2005	8/29/2005	10/1/2005	Hurricane Katrina Evacuation	None	B

Source: FEMA, Oregon Disaster History. Major Disaster Declarations.

Note: Oregon was granted an Emergency Declaration to support the Hurricane Katrina Evacuation. The Oregon National Guard deployed over 2,100 soldiers and their equipment to New Orleans in less than three days.

Hazard Profiles

The following subsections briefly describe relevant information for each hazard. For additional background on the hazards, vulnerabilities and general risk assessment information for hazards in Yamhill County, refer to the [Risk Assessment for Region 3, Mid/Southern Willamette Valley, of the Oregon NHMP \(2015\)](#).

Drought.....	7
Earthquake	11
Flood.....	23
Landslide	32
Severe Weather	38
Windstorm	39
Winter Storm	41
Volcanic Event	45
Wildfire	48

Drought

Significant Changes since Previous NHMP:

One (1) significant drought event has occurred since the previous NHMP.

Characteristics

A drought is a period of drier than normal conditions. Drought occurs in virtually every climatic zone, but its characteristics vary significantly from one region to another. Drought is a temporary condition; it differs from aridity, which is restricted to low rainfall regions and is a permanent feature of climate. The extent of drought events depends upon the degree of moisture deficiency and the duration and size of the affected area. Typically, droughts occur as regional events and often affect more than one city and county.

There are four types of drought: meteorological, agricultural, hydrological and socioeconomic. Meteorological drought is based on the degree of dryness. Agricultural drought focuses the amount of soil moisture versus the needs of the crops. Hydrological drought is associated with shortfalls of surface and subsurface water supply. Socioeconomic drought refers to physical water shortages and its human effect, and occurs when the need for water exceeds the supply resulting in a shortfall.

Location and Extent

Droughts occur in every climate zone and can vary from region to region. Drought may occur throughout Yamhill County and may have profound effects on the economy, particularly the agricultural and hydro-power sectors. The extent of drought depends upon the degree of moisture deficiency, and the duration and size of the affected area. Typically, droughts occur as regional events and often affect more than one county. In severe droughts, environmental and economic consequences can be significant. The extent of the hazard is shown in Figure 2-3 and Figure 2-4, surface water supply index values below -1.5 indicate low water availability, which could lead to drought.

History

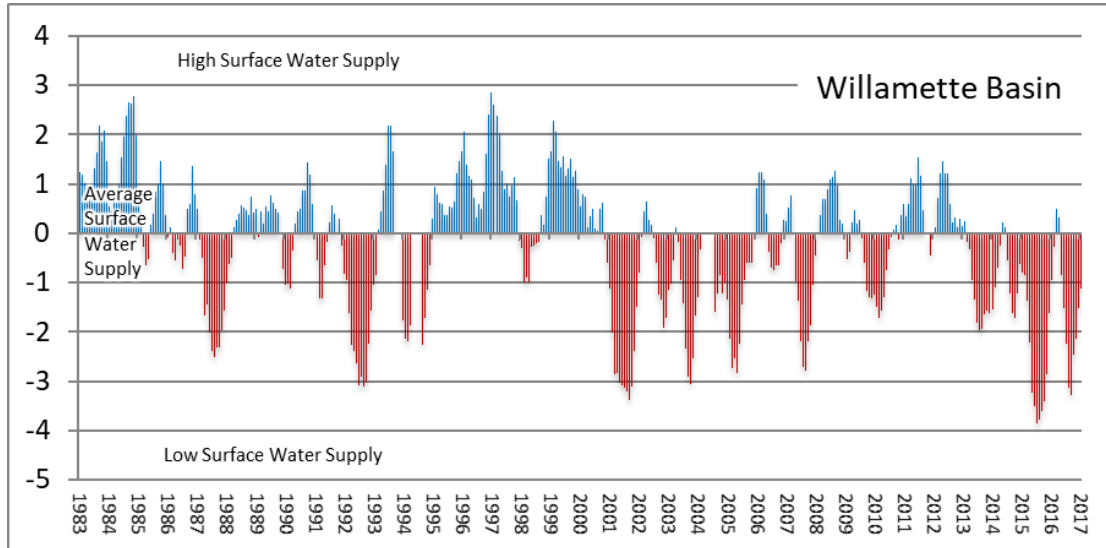
Yamhill County experiences annual dry conditions typically during the summer months from July through September. Drought is typically measured in terms of water availability in a defined geographical area. It is common to express drought with a numerical index that ranks severity. Most federal agencies use the Palmer Method which incorporates precipitation, runoff, evaporation and soil moisture. However, the Palmer Method does not incorporate snowpack as a variable. Therefore, it is not believed to provide a very accurate indication of drought conditions in Oregon and the Pacific Northwest.

The Surface Water Supply Index (SWSI) from the Natural Resources Conservation Service is an index of current water conditions throughout the state. The index utilizes parameters derived from snow, precipitation, reservoir and stream flow data. NRCS collects data each month from key stations in each basin. The lowest SWSI value, -4.2, indicates extreme drought conditions (Low Surface Water Supply ranges from -1.6 to -4.2). The highest SWSI value, +4.2, indicates extreme wet conditions (High Surface Water Supply ranges from +1.6

to +4.2). The mid-point is 0.0, which indicates an average water supply (Average Water Supply ranges from +1.5 to -1.5).

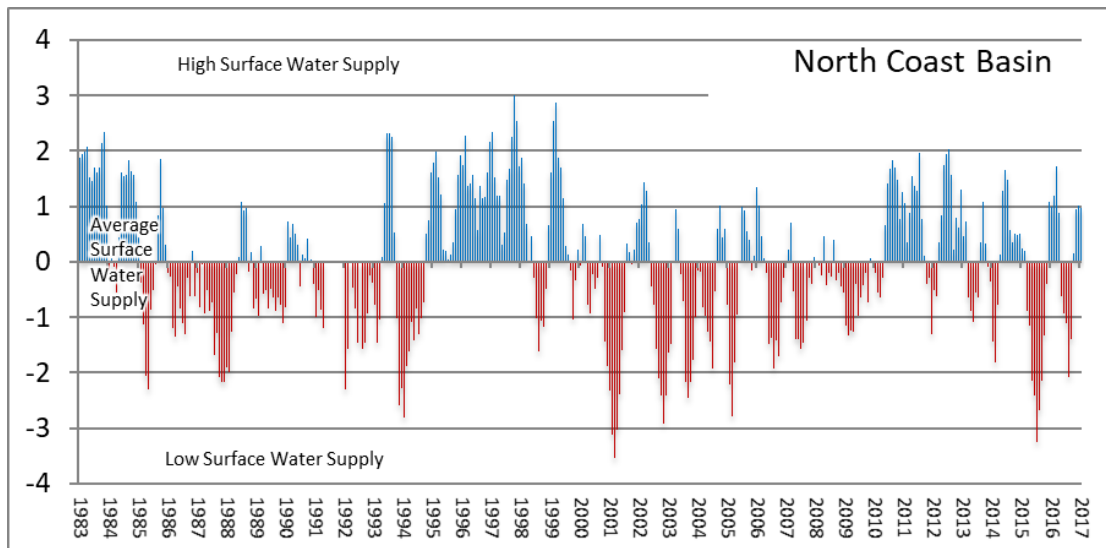
The figures below show the monthly history of SWSI values from 1983 to 2017 for the Willamette Basin (Figure 2-3, includes all portions of the County that are outside of the North Coast Basin) and the North Coast Basin (Figure 2-4, includes the far west portion of the County that is within the Oregon Coast Range that extends into the North Coast Basin).

Figure 2-3 SWSI Values for the Willamette Basin



Source: Department of Agriculture-Natural Resources Conservation Service, "Surface Water Supply Index, Willamette Basin" www.or.nrcs.usda.gov. Accessed December 2020.

Figure 2-4 SWSI Values for the North Coast Basin



Source: Department of Agriculture-Natural Resources Conservation Service, "Surface Water Supply Index, North Coast Basin". www.or.nrcs.usda.gov. Accessed December 2020.

Research shows that the periods of drought have fluctuated; recent drought periods in the Willamette Basin occurred (SWSI < -3.0 for four or more months) in 2001 and 2015 (no drought periods occurred in the North Coast Basin). In addition, two (2) executive orders

declaring drought emergencies have occurred in 1991 and 2015; the 2015 drought was also federally declared.²

El Niño/La Niña

El Niño Southern Oscillation (ENSO) weather patterns can increase the frequency and severity of drought. During El Niño periods, alterations in atmospheric pressure in equatorial regions yield an increase in the surface temperature off the west coast of North America. This gradual warming sets off a chain reaction affecting major air and water currents throughout the Pacific Ocean; La Niña periods are the reverse with sustained cooling of these same areas. In the North Pacific, the Jet Stream is pushed north, carrying moisture laden air up and away from its normal landfall along the Pacific Northwest coast. In Oregon, this shift results in reduced precipitation and warmer temperatures, normally experienced several months after the initial onset of the El Niño. These periods tend to last nine to twelve months, after which surface temperatures begin to trend back towards the long-term average. El Niño periods tend to develop between March and June, and peak from December to April. ENSO generally follows a two to seven-year cycle, with El Niño or La Niña periods occurring every three to five years. However, the cycle is highly irregular, and no set pattern exists. The last major El Niño was during 1997-1998, and in 2015-2016 Oregon experience a “super” El Niño (the strongest in 15 years, the two previous events occurred in 1982-1983 and 1997-1998) that included record rainfall and snowpack in areas of the state.³

Future Climate Variability⁴

Climate models for Oregon suggest, future regional climate changes include increases in temperature around 0.2-1°F per decade in the 21st Century, along with warmer and drier summers, and some evidence that extreme precipitation will increase in the future. By the year 2100, Oregon is expected to see temperature increases between 4 and 9°F, depending on global emissions. Increased droughts may occur in the Willamette Valley under various climate change scenarios because of various factors, including reduced snowpack, rising temperatures, and likely reductions in summer precipitation. Climate models suggest that as the region warms, winter snow precipitation will likely shift to higher elevations and snowpack will be diminished as more precipitation falls as rain, altering surface flows. Increases in rainfall may contribute to greater risk of landslide in certain areas.

Probability Assessment

Based on the available data and research the Steering Committee (Steering Committee) assessed the **probability of experiencing a locally severe drought as “High,”** meaning one incident is likely within the next 10 to 35 years.

Droughts are not uncommon in the State of Oregon, nor are they just an “east of the mountains” phenomenon. They occur in all parts of the state, in both summer and winter. Oregon’s drought history reveals many short-term and a few long-term events. The average recurrence interval for severe droughts in Oregon is somewhere between 8 and 12 years.

² Oregon Water Resources Department Public Declaration Status Report, http://apps.wrd.state.or.us/apps/wr/wr_drought/declaration_status_report.aspx, accessed December, 2019.

³ Cho, Renne. “El Nino and global warming – what’s the connection.” Phys.org, February 3, 2016. <https://phys.org/news/2016-02-el-nino-global-warmingwhat.html>

⁴ Oregon Climate Change Research Institute (OCCRI), 4th Oregon Climate Assessment Report (2019) and Northwest Climate Assessment Report (2013). <http://www.occri.net/publications-and-reports/publications/>

According to SWSI analysis there have been three (3) droughts between 1983 and 2017 (see Figure 2-3 and Figure 2-4).

Vulnerability Assessment

The Steering Committee rated the County as having a **“moderate” vulnerability to drought hazards**, meaning it is expected that between one and 10% of the unincorporated County’s population or assets would be affected by a major drought emergency or disaster.

The environmental and economic consequences can be significant, especially for the agricultural sector. Drought also increases the probability of wildfires – a major natural hazard concern for Yamhill County. Drought can affect all segments of Yamhill County’s population, particularly those employed in water-dependent activities (e.g., agriculture, hydroelectric generation, recreation, etc.). Also, domestic water-users may be subject to stringent conservation measures (e.g., rationing) as per the County’s water management plan.

All parts of Yamhill County are susceptible to drought; however, the following areas and issues are of concern:

- Drinking water systems
- Power and water enterprises
- Residential and community wells in rural areas
- Fire response capabilities
- Fish and wildlife

Potential impacts to county water supplies and the agriculture industry are the greatest threats. Additionally, long-term drought periods of more than a year can impact forest conditions and set the stage for potentially destructive wildfires.

More information on this hazard can be found in the [Risk Assessment for Region 3, Mid/Southern Willamette Valley, of the Oregon NHMP \(2015\)](#).

Earthquake

Significant Changes since Previous NHMP:

There have been no significant updates since the previous plan. The Oregon Resilience Plan (2013) has been cited and incorporated where applicable.

Characteristics

The Pacific Northwest in general is susceptible to earthquakes from four sources: 1) the offshore Cascadia Subduction Zone, 2) deep intraplate events within the subducting Juan de Fuca Plate, 3) shallow crustal events within the North American Plate, and 4) earthquakes associated with volcanic activity.

Crustal Fault Earthquakes

Crustal fault earthquakes are the most common earthquakes and occur at relatively shallow depths of 6-12 miles below the surface.⁵ While most crustal fault earthquakes are smaller than magnitude 4 and generally create little or no damage, they can produce earthquakes of magnitudes up to 7, which cause extensive damage. Yamhill County has the following documented crustal faults: Gales Creek-Newberg-Mt. Angel Structural Zone (including the Newberg Fault). The Mount Angel Fault is located approximately 15 miles east of Yamhill County, and is responsible for the 5.7 magnitude Spring Break Quake in 1993.

Deep Intraplate Earthquakes

Occurring at depths from 25 to 40 miles below the earth's surface in the subducting oceanic crust, deep intraplate earthquakes can reach up to magnitude 7.5.⁶ The February 28, 2001 earthquake in Washington State was a deep intraplate earthquake. It produced a rolling motion that was felt from Vancouver, British Columbia to Coos Bay, Oregon and east to Salt Lake City, Utah. A 1965 magnitude 6.5 intraplate earthquake centered south of Seattle-Tacoma International Airport caused seven deaths.⁷

Subduction Zone Earthquakes

The Pacific Northwest is located at a convergent plate boundary, where the Juan de Fuca and North American tectonic plates meet. The two plates are converging at a rate of about 1-2 inches per year. This boundary is called the Cascadia Subduction Zone (CSZ). It extends from British Columbia to northern California. Subduction zone earthquakes are caused by the abrupt release of slowly accumulated stress.⁸

Subduction zones like the CSZ have produced earthquakes with magnitudes of 8 or larger. Historic subduction zone earthquakes include the 1960 Chile (magnitude 9.5) and 1964

⁵ Madin, Ian P. and Zhenming Wang. Relative Earthquake Hazard Maps Report. (1999) DOGAMI.

⁶ Planning for Natural Hazards: The Oregon Technical Resource Guide, Department of Land Conservation and Development (July 2000), Ch. 8, pp. 8.

⁷ The Oregonian. "A region at risk." March 4, 2001.

⁸ Questions and Answers on Earthquakes in Washington and Oregon (February 2001) www.geophys.washington.edu/seis/pnsn/info_general/faq.html.

southern Alaska (magnitude 9.2) earthquakes⁹ with more recent events being the 2004 Indian Ocean (magnitude 9.1) and 2011 Japan (magnitude 9).

Volcanic Earthquakes

Volcanic earthquakes are usually smaller than magnitude 2.5, roughly the threshold for shaking felt by observers close to the event. Swarms of small earthquakes may persist for weeks to months before eruptions, but little or no earthquake damage would occur to buildings in surrounding communities. Some volcanic related swarms may include earthquakes as large as about magnitude 5.

While all four types of earthquakes have the potential to cause major damage, local crustal faults are expected to be more damaging primarily because of their proximity to densely populated areas.¹⁰

Location and Extent

The seismic hazard for Yamhill County arises predominantly from major earthquakes on the Cascadia Subduction Zone. Large (M6.8-7.0M), crustal earthquakes in or near Yamhill County could be more damaging than a CSZ earthquake but the likelihood of these events is considerably less. Additional fault zones throughout the county and region may produce localized crustal earthquakes up to 6.0. Table 2-6 presents a list of the different Class A and B fault lines throughout the county. It is expected that earthquakes in Yamhill County would affect water and sewer systems, natural gas lines, bridges and power/electrical systems. For hazard mitigation purposes, it should be considered that the extent of a major event would be greater than county-wide. A local earthquake of M 6.0 or a regional M 9.0 earthquake is likely to cause substantial structural damage to bridges, buildings, utilities, and communications systems, as well as the following impacts to infrastructures and the environment:

- Floods and landslides
- Fires, explosions, and hazardous materials incidents
- Disruption of vital services such as water, sewer, power, gas, and transportation routes
- Disruption of emergency response systems and services
- Displaced Households
- Economic losses for buildings
- Economic loss to highways, airports, communications
- Generated debris
- Illness, injury, and death
- Significant damage to critical and essential facilities, including schools, hospitals, fire stations, police departments, city hall

⁹ The Oregonian. "A region at risk." March 4, 2001.

¹⁰ Bauer, John, William Burns, and Ian Madin. Earthquake Regional Impact Analysis for Yamhill, Multnomah, and Washington Counties, Oregon. (2018). DOGAMI

Table 2-6 Class A and B Faults Located in or near Yamhill County-

Name	Class	Fault ID	Primary County, State	Length (km)	Time of Most Recent Deformation	Slip-Rate Category
Gales Creek Fault Zone	A	718	Washington County	73km	undifferentiated Quaternary	Less than 0.2 mm/yr
Newberg Fault	A	717	Yamhill County	5km	undifferentiated Quaternary	Less than 0.2 mm/yr
Canby-Molalla Fault	A	716	Clackamas County	50km	Latest Quaternary (<15ka)	Less than 0.2 mm/yr
Mount Angel Fault	A	873	Marion County	30km	Latest Quaternary (<15ka)	Less than 0.2 mm/yr
Bolton Fault	B	874	Clackamas County	9km	Quaternary (<1.6 Ma)	Less than 0.2 mm/yr
Oatfield Fault	A	875	Washington County	29km	Quaternary (<1.6 Ma)	Less than 0.2 mm/yr
Portland Hills Fault	A	877	Multnomah County	49km	Quaternary (<1.6 Ma)	Less than 0.2 mm/yr
Salem-Eola Hills homocline	A	719	Polk County	32km	undifferentiated Quaternary	Less than 0.2 mm/yr

Source: Source: US Geological Survey (USGS), Quaternary Fault and Fold Database

For more information on Class A and B faults located in Yamhill County see the US Geological Survey, Quaternary Fault and Fold Database:

<https://earthquake.usgs.gov/hazards/qfaults/>.

The extent of the earthquake hazard is measured in magnitude. Figure 2-5 shows active faults and areas for liquefaction hazards. The figure also shows that recent earthquakes have registered as Magnitude 5 or less (earthquakes at this magnitude are often felt but cause no damage, or only minor damage). Yamhill County can expect similar earthquake magnitudes to occur in the future. The Cascadia Subduction Zone earthquake has the capacity to cause a magnitude 8.5 or greater earthquake; however, due to the distance from Yamhill County the damage locally is expected to be significant, but less than a local crustal fault.

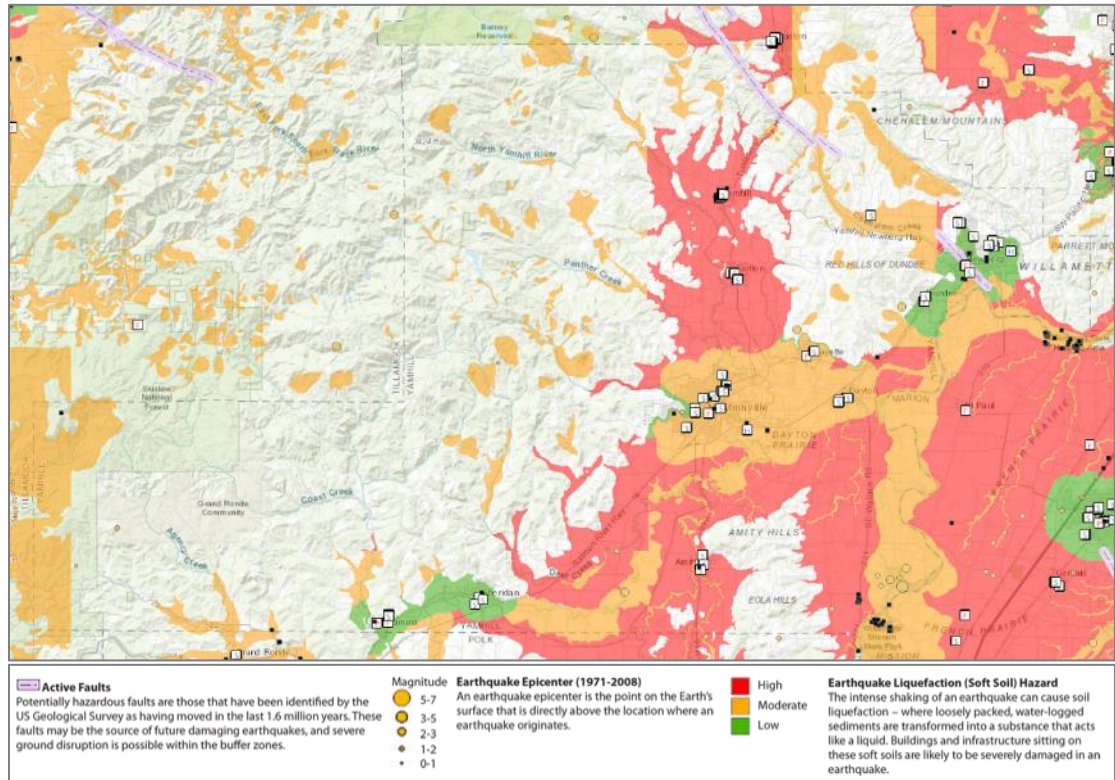
Liquefaction

Liquefaction occurs when ground shaking causes wet granular soils to change from a solid state to a liquid state. This results in the loss of soil strength and the soil's ability to support weight. Buildings and their occupants are at risk when the ground can no longer support these buildings and structures.

To develop a regional liquefaction hazard map for Yamhill County, DOGAMI started by collecting the best available geologic information. Hazard groupings were primarily based on lithologies and checked with individual data points. With the available information compiled, DOGAMI assigned liquefaction susceptibility classes based on the dominant lithologies for each geologic unit in the study area, checked source data boundaries, and simplified the GIS outputs into four relative hazard classes: None/Very Low, Low, Moderate, and High. Areas with Moderate to High liquefaction susceptibilities are concentrated along the rivers and flood plains in the Willamette Valley, Cascade Range tributaries, and major stream valleys within the Cascade Range. Older river terrace and Missoula Flood deposits in

the Willamette Valley were assigned a lower liquefaction hazard yet are still considered susceptible to liquefaction in larger earthquakes. It is important to note that the quality and scale of the available base maps precluded identification of all liquefaction hazard areas, particularly in the eastern portion of the county.

Figure 2-5 Earthquake Active Faults, Epicenters (1971-2008), and Soft Soils



Source: [Oregon HazVu: Statewide Geohazards Viewer](#) – To view map in more detail click hyperlink to left.

Amplification

Soils and soft sedimentary rocks near the earth's surface can modify ground shaking caused by earthquakes. One of these modifications is amplification. Amplification increases the magnitude of the seismic waves generated by the earthquake. The amount of amplification is influenced by the thickness of geologic materials and their physical properties. The degree of amplification greatly affects the performance of infrastructure in earthquake. Buildings and structures built on soft and unconsolidated soils, for example, face greater risk. Amplification can also occur in areas with deep sediment filled basins and on ridge tops.

DOGAMI developed the ground shaking amplification map based generally on the NEHRP 1997 method of categorizing relative hazards and simplified the GIS outputs into relative hazard classes – Low, Moderate, and High. The resulting map is not intended to be used in place of site-specific studies. The high hazard soils are located along and adjacent to streams and rivers in Yamhill County. The western portion of the county is varied, with competent bedrock areas mapped as Low hazard, dense soil areas mapped as Moderate hazard, and

younger landslide and alluvial deposit areas mapped as High hazard for ground shaking amplification.¹¹

DOGAMI and Yamhill County GIS worked together to combine the ground shaking, amplification, and liquefaction data to develop a composite Relative Earthquake Hazard Map. This map represents the overall earthquake hazards in Yamhill County.

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 Yamhill County predominately within the "Valley Zone" (Valley Zone, from the summit of the Coast Range to the summit of the Cascades).

DOGAMI, in partnership with other state and federal agencies, has undertaken a rigorous program in Oregon to identify seismic hazards, including active fault identification, bedrock shaking, tsunami inundation zones, ground motion amplification, liquefaction and earthquake induced landslides. DOGAMI has published several seismic hazard maps that are available for communities to use. The maps show liquefaction, ground motion amplification, landslide susceptibility and relative earthquake hazards. OPDR used the DOGAMI Statewide Geohazards Viewer to present a visual map of recent earthquake activity, active faults and liquefaction; ground shaking is generally expected to be higher in the areas marked by soft soils in the map above. The severity of an earthquake is dependent upon a number of factors including: 1) the distance from the earthquake's source (or epicenter); 2) the ability of the soil and rock to conduct the earthquake's seismic energy; 3) the degree (i.e., angle) of slope materials; 4) the composition of slope materials; 5) the magnitude of the earthquake; and 6) the type of earthquake.

For more information, see the following reports:

- Geologic hazards, earthquake and landslide hazard maps, and future earthquake damage estimates for six counties in the Mid/Southern Willamette Valley including Yamhill, Marion, Polk, Benton, Linn, and Lane Counties, and the City of Albany, Oregon (2008, [IMS-24](#))
- Statewide Cascadia earthquake hazard data (2013, [O-13-06](#))
- Cascadia Subduction Zone earthquakes: A magnitude 9.0 earthquake scenario, (2012, [O-12-22](#))
- Statewide seismic needs assessment: Implementation of Oregon 2005 Senate Bill 2 relating to public safety, earthquakes, and seismic rehabilitation of public buildings, (2007, [O-07-02](#)).
- Map of selected earthquakes for Oregon: 1841-2002 (2003, [O-03-02](#)).
- Interpretive Map Series: IMS-9 - Relative earthquake hazard maps for selected urban areas in western Oregon (2000, [IMS-9](#)).
- Interpretive Map Series: IMS-7 - Relative earthquake hazard maps for selected urban areas in western Oregon (1999, [IMS-7](#)).
- Earthquake damage in Oregon: Preliminary estimate for future earthquake losses (1999, [SP-29](#))

¹¹ Burns, Hofmeister, Wang, 2008. "Geologic Hazards, Earthquake and Landslide Hazard Maps, and Future Earthquake Damage Estimates for Six Counties in the Mid/Southern Willamette Valley including Yamhill, Marion, Polk, Benton, Linn and Lane Counties and the City of Albany, Oregon: Oregon Department of Geology and Mineral Industries [Interpretive Map Series IMS-24](#)."

Additional reports are available via DOGAMI's Publications Search website:
<https://www.oregongeology.org/pubs/pubsearch.htm>

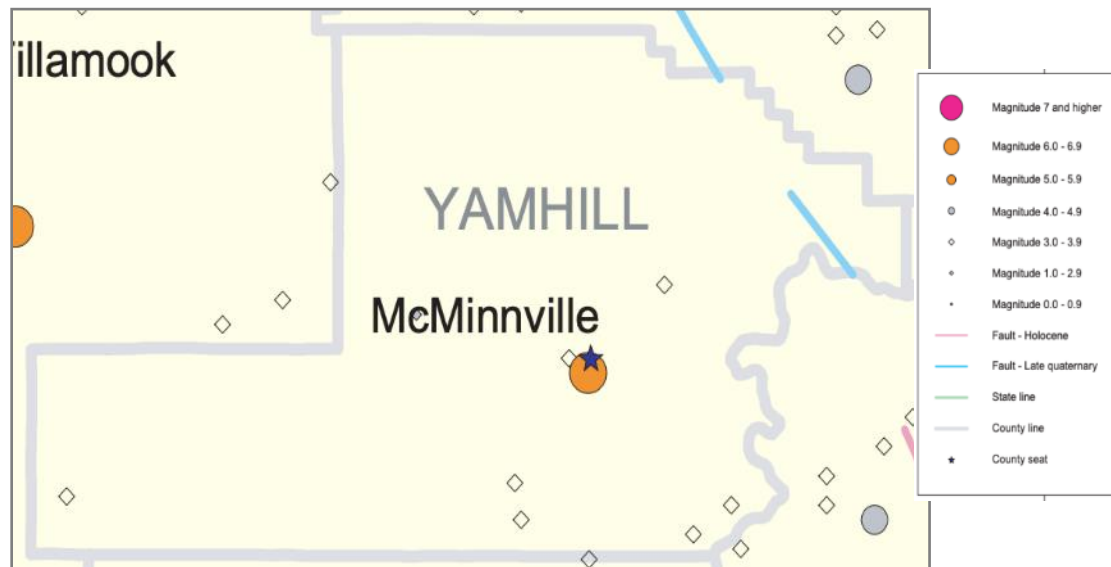
Other agency/ consultant reports:

[Oregon Resilience Plan \(2013\)](#)

History

Dating back to 1841, there have been more than 6,000-recorded earthquakes in Oregon, most with a magnitude below three (Figure 2-5 and Figure 2-6). Portland and its surrounding region is potentially the most seismically active area within Oregon. The Portland metropolitan region has encountered seventeen earthquakes of an estimated magnitude of four and greater, with major earthquakes in 1877 (magnitude 5.3), 1962 (magnitude 5.2), and 1993 (magnitude 5.6). Although seismograph stations were established as early as 1906 in Seattle and 1944 in Corvallis, improved seismograph coverage of the Portland region did not begin until 1980, when the University of Washington expanded its regional network into northwestern Oregon.

Figure 2-6 Regional Earthquake History (1841-2001)



Source: DOGAMI, Snippet of Map of Selected Earthquakes for Oregon, 1841 through 2002 ([O-03-02](#))

Geologic evidence shows that the Cascadia Subduction Zone has generated great earthquakes, most recently about 300 years ago. It is generally accepted to have been magnitude 9 or greater. The average recurrence interval of these great Cascadia earthquakes is approximately 500 years, with gaps between events as small as 200 years and as large as 1,000 years.

Probability Assessment

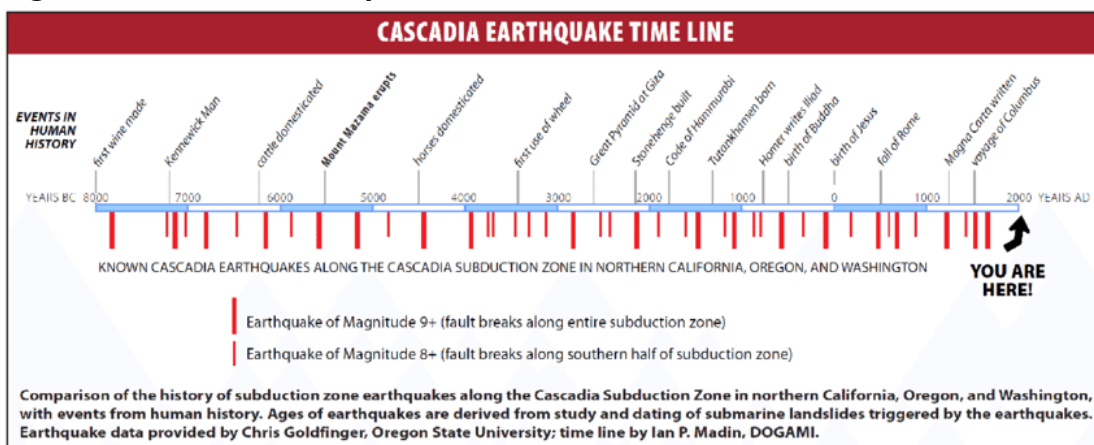
Based on the available data and research the Steering Committee determined the **probability of experiencing a Cascadia Subduction Zone (CSZ) is “moderate”**, meaning one incident may occur within the next 35 to 75 years. The Steering Committee determined the

probability of experiencing a crustal earthquake is “low”, meaning one incident may occur within the next 100 years.

Yamhill County is susceptible to deep intraplate events within the Cascadia Subduction Zone (CSZ), where the Juan de Fuca Plate is diving beneath the North American Plate and shallow crustal events within the North American Plate.

According to the Oregon NHMP, the return period for the largest of the CSZ earthquakes (Magnitude 9.0+) is 530 years with the last CSZ event occurring 314 years ago in January of 1700 (Figure 2-7). The probability of a 9.0+ CSZ event occurring in the next 50 years ranges from 7 - 12%. Notably, 10 - 20 “smaller” Magnitude 8.3 - 8.5 earthquakes occurred over the past 10,000 years that primarily affected the southern half of Oregon and northern California. The average return period for these events is roughly 240 years. The combined probability of any CSZ earthquake occurring in the next 50 years is 37 - 43%.¹²

Figure 2-7 Cascadia Earthquake Timeline



Source: OSSPAC, [The Oregon Resilience Plan](#) (2013)

Establishing a probability for crustal earthquakes is difficult given the small number of historic events in the region. However, both faults used to inform this report (Gales Creek Fault zone and the Newberg Fault) have a low probability of rupture. Earthquakes generated by volcanic activity in Oregon’s Cascade Range are possible, but likewise unpredictable. For more information, see the DOGAMI reports cited previously.

Vulnerability Assessment

The Steering Committee rated the County as having a **“high” vulnerability to the Cascadia Subduction Zone (CSZ) earthquake hazard** meaning that more than 10% of the unincorporated County’s population or assets would be affected by a major CSZ event. The Steering Committee rated the County as having a **“moderate” vulnerability to a crustal earthquake hazard**, meaning that one to 10% of the unincorporated County’s population or assets would be affected by a major crustal earthquake event.

¹² DLCD, Oregon Natural Hazards Mitigation Plan (2015).

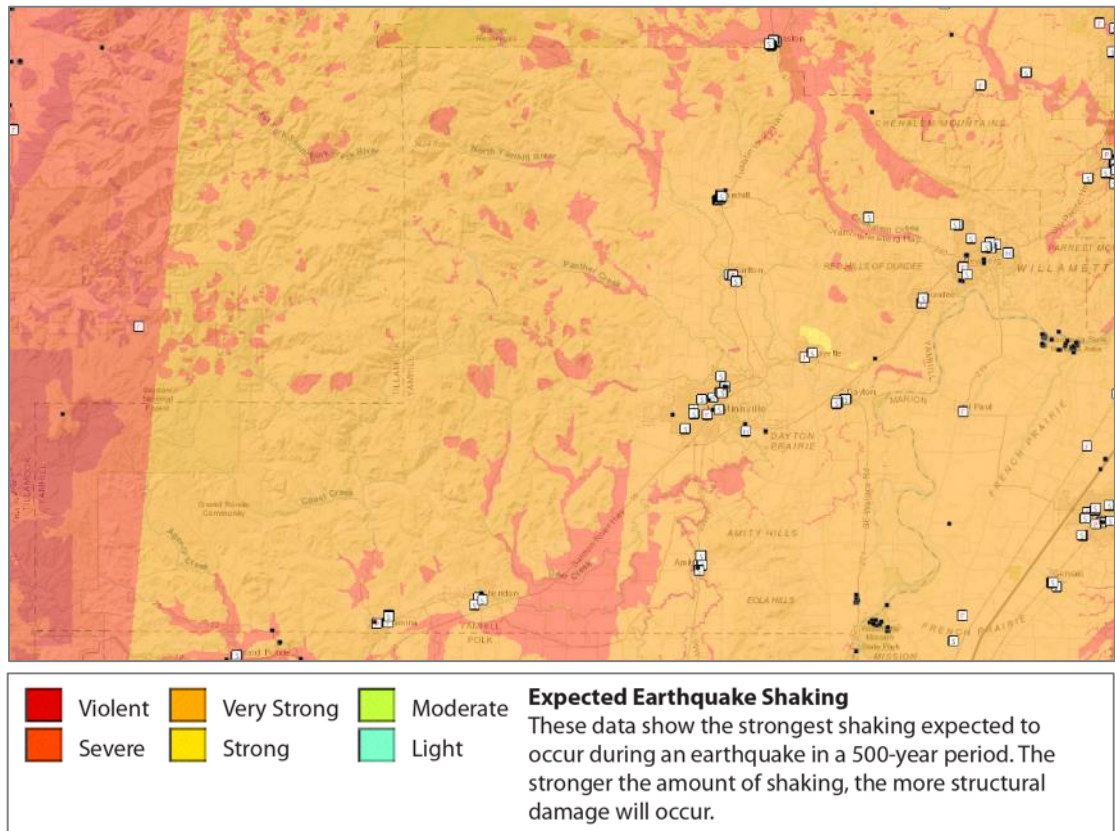
The local crustal faults, the county’s proximity to the Cascadia Subduction Zone, potential slope instability and the prevalence of certain soils subject to liquefaction and amplification combine to give the county a high-risk profile.

Factors included in an assessment of earthquake risk include population and property distribution in the hazard area, the frequency of earthquake events, landslide susceptibility, buildings, infrastructure and disaster preparedness of the region. This type of analysis can generate estimates of the damages to the county due to an earthquake event in a specific location.

Seismic activity can cause great loss to businesses, either a large-scale corporation or a small retail shop. Losses not only result in rebuilding cost, but fragile inventory and equipment can be destroyed. When a company is forced to stop production for just a day, business loss can be tremendous. Residents, businesses and industry all suffer temporary loss of income when their source of finances is damaged or disrupted.

Figure 2-8 shows the expected shaking/damage potential for Yamhill County as a result of a Cascadia Subduction Zone (CSZ) earthquake event.

Figure 2-8 Cascadia Subduction Zone Expected Shaking



Source: [Oregon HazVu: Statewide Geohazards Viewer](#) – To view map in more detail click hyperlink to left.

The figure shows that the county will experience “moderate” to “severe” shaking that will last two to four minutes. The strong shaking will be extremely damaging to lifeline transportation routes including I-5. For more information on expected losses due to a CSZ event see the [Oregon Resilience Plan](#).

2008 Assessment

There has not been an assessment of earthquake vulnerability since 2008. In 2008, the Oregon Department of Geology and Mineral Industries (DOGAMI) developed regional earthquake hazard information to assess potential damages and losses for various earthquake scenarios in the Mid-Willamette Valley (see also 1999 Assessment below).¹³ Note this assessment utilizes assessor and building data from 2005 and population and housing data from the 2000 Decennial US Census; see Appendix C for updated information. More specifically, DOGAMI:

- Identified the primary geologic hazards of Yamhill, Marion, Polk, Benton, Linn, and Lane Counties and the City of Albany;
- Developed countywide earthquake and landslide hazard maps for each county; and
- Developed future earthquake damage estimates for each community.

Damage and loss estimates for each community were analyzed for two earthquake scenarios:

- A magnitude ~6.8 crustal fault earthquake
- A magnitude 8.5 Cascadia Subduction Zone earthquake

Information was consolidated into the Hazards U.S. Multi-Hazard methodology and computer application (HAZUS – MH), which is a federally developed program used to model various earthquake scenarios and estimate associated damage and loss.

The following is a brief summary of damage and loss estimates for Yamhill County in a magnitude 6.8 Newberg Fault Zone crustal earthquake scenario:

- Expected Building Damages: 26% extensive to complete; 24% moderate
- Estimated fatalities during late afternoon business hours: 67
- Injuries from minor to life threatening: 1,178
- Households displaced: 4,256
 - Water and electric service is expected to not be available immediately after an event; majority of water and electric back within 30 days
- People needing shelter: 1,008 (out of 84,992)
- Injuries requiring hospitalization: 53
- No essential facilities are expected to be destroyed; however, many will not be able to be occupied immediately after the event.

The following is a brief summary of damage and loss estimates for Yamhill County in a magnitude 8.5 Cascadia Subduction Zone earthquake scenario¹⁴:

- Expected Building Damages: 19% extensive to complete; 8% moderate
- Estimated fatalities during late afternoon business hours: 74
- Injuries from minor to life threatening: 1,190

¹³ Burns, William J., R. Jon Hofmeister, and Yumei Wang. Geologic Hazards, Earthquake and Landslide Hazard Maps, and Future Earthquake Damage Estimates for Six Counties in the Mid/Southern Willamette Valley including Yamhill, Marion, Polk, Benton, Linn, and Lane Counties, and the City of Albany, Oregon. Oregon Department of Geology and Mineral Industries Interpretive Map Series IMS-24. 2008.

¹⁴ Note that this information differs from that provided in the 1999 report (Table 2-7) based on the methodology and modeling that was used. See full reports for details.

- Households displaced: 3,082
 - Water services expected to not be immediately available to about half of households and back within one week; no disruption of electric service is expected
- People needing shelter: 750 (out of a population of 84,992 per the 2000 Census)
- Injuries requiring hospitalization: 53
- No essential facilities are expected to be completely destroyed, however, many will not be able to be occupied immediately after the event.

For more information, see: Geologic hazards, earthquake and landslide hazard maps, and future earthquake damage estimates for six counties in the Mid/Southern Willamette Valley including Yamhill, Marion, Polk, Benton, Linn, and Lane Counties, and the City of Albany, Oregon (2008, [IMS-24](#)).

2007 Rapid Visual Screening

As noted in the community profile (Appendix C) approximately 57% of residential buildings were built prior to 1990 (79% in the unincorporated portions of the County), which increases the County's vulnerability to the earthquake hazard.

In 2007, DOGAMI completed a rapid visual screening (RVS) of educational and emergency facilities in communities across Oregon, as directed by the Oregon Legislature in Senate Bill 2 (2005). RVS is a technique used by FEMA ([FEMA P-154](#)) to identify, inventory and rank buildings that are potentially vulnerable to seismic events. DOGAMI ranked each building surveyed with a 'low,' 'moderate,' 'high,' or 'very high' potential for collapse in the event of an earthquake. It is important to note that these rankings represent a probability of collapse based on limited observed and analytical data and are therefore approximate rankings. To fully assess a building's potential for collapse, a more detailed engineering study completed by a qualified professional is required, but the RVS study can help to prioritize which buildings to survey.

DOGAMI screened 52 facilities in the unincorporated County and incorporated cities. There are no screened facilities located within the unincorporated portion of the County with a 'high' or 'very high' potential for collapse (only the Perrydale School and Ewing Young Elementary School are within the unincorporated County). Collapse potential for facilities located in the incorporated cities are listed in the addenda (Volume II). Additional information, can be found within the [RVS study](#) on DOGAMI's website (www.oregongeology.org).

Mitigation Successes

Seismic retrofit grant awards per the [Seismic Rehabilitation Grant Program](#)¹⁵ have been funded to retrofit Adams Elementary School (McMinnville), (2017 grant award, \$1,500,000); Memorial Elementary School (McMinnville), (2017 grant award, \$692,688); Newberry Elementary School (McMinnville), (2017 grant award, \$420,187); Yamhill Fire District Fire

¹⁵ 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.

Station (2017 grant award, \$594,410); City of Newberg Public Safety Building (2018 grant award, \$815,687); and Dayton Grade School (2019 grant award, \$2,499,570).

See city addenda for mitigation successes within each city.

For more information, see: Statewide seismic needs assessment: Implementation of Oregon 2005 Senate Bill 2 relating to public safety, earthquakes, and seismic rehabilitation of public buildings, (2007, [O-07-02](#)).

1999 Assessment

Factors included in an assessment of earthquake risk include population and property distribution in the hazard area, the frequency of earthquake events, landslide susceptibility, buildings, infrastructure, and disaster preparedness of the region. This type of analysis can generate estimates of the damages to the county due to an earthquake event in a specific location.

Seismic activity can cause great loss to businesses, either a large-scale corporation or a small retail shop. Losses not only result in rebuilding cost, but fragile inventory and equipment can be destroyed. When a company is forced to stop production for just a day, business loss can be tremendous. Residents, businesses, and industry all suffer temporary loss of income when their source of finances is damaged or disrupted.

The potential losses from an earthquake in Yamhill County extend beyond those to human life, homes, property and the landscape. A recent earthquake damage model has not been conducted for Yamhill County, however, based upon data from a 1999 DOGAMI report rough loss estimates are available (see also 2008 Assessment above). The economic base in Yamhill County is estimated at \$3.038 billion (in 1999 dollars; \$4.693 billion in 2019 dollars, ranking it 14 of 36 Oregon counties); it is expected that the County will incur total direct losses valuing \$259 million (in 1999 dollars, \$400 million in 2019 dollars) for the Cascadia model and \$1.1 billion (in 1999 dollars, \$1.6 billion in 2015 dollars) for the 500-year model. The CSZ event direct losses amount to a loss ratio of five-percent, while the 500-year model event direct losses amount to a loss ratio of 13-percent.¹⁶ Table 2-7 on the next page adjusts the economic loss estimates from DOGAMI's 1999 report to account for inflation and reflect potential economic loss in 2019 dollars.

While the expected losses have increased due to increased development in the county, as well as inflation, the loss ratio and relative damage for the county is expected to be similar. See table on the following page for more information on expected losses. Local business economies are at substantial risk if an earthquake damages or otherwise necessitates the closure of any of the major transportation routes.

For more information, see: [Special Paper: SP-29, Earthquake damage in Oregon Preliminary estimates of future earthquake losses \(1999\)](#)

¹⁶ Ibid. The loss ratio is determined as a percentage of the expected losses to the county's economic base.

Table 2-7 Yamhill County Earthquake Damage Summary

Yamhill County	8.5 Cascadia Subduction Zone Event	500-year model
Injuries	148	427
Death	3	9
Displaced households	385	871
Short-term shelter needs	310	696
Economic losses for buildings	\$400 million*	\$1.01 billion*
Operational the day after the quake		
Fires Stations	52%	n/a
Police Stations	45%	n/a
Schools	45%	n/a
Bridges	63%	n/a
Economic losses to		
Highways	\$7.7 million*	\$17 million*
Airports	\$12.3 million*	\$30.9 million*
Communication Systems		
Economic losses	\$1.5 million*	\$4.6 million*
Operating the day of the quake	53%	n/a
Debris generated (<i>thousands of tons</i>)	247	532

These figures have a high degree of uncertainty and should be used only for general planning purposes. Because of rounding, numbers may not add up to 100%. Because the 500 year model includes several earthquakes, the number of facilities operational the "day after" cannot be calculated.

Source: Y. Wang & J.L. Clark, Special Paper 29, Earthquake Damage in Oregon: Preliminary Estimates of Future Earthquake Losses. 1999. DOGAMI.

Note: * - 1999 dollars were adjusted for inflation to represent estimated economic loss in 2019 dollars (State of Oregon Employment Department Inflation Calculator)

More information on this hazard can be found in the [Risk Assessment for Region 3, Mid/Southern Willamette Valley, of the Oregon NHMP \(2015\)](#).

Flood

Significant Changes since Previous NHMP:

This section has updated data for the National Flood Insurance Program and hazard history.

Characteristics

Flooding results when rain and snowmelt create water flow that exceeds the carrying capacity of rivers, streams, channels, ditches and other watercourses. In Oregon, flooding is most common from October through April when storms from the Pacific Ocean bring intense rainfall. Most of Oregon's destructive natural disasters have been floods.¹⁷

The flood events in Yamhill County usually occur when storms move in from the Pacific, dropping heavy precipitation into the Willamette valley; flooding is most significant during rain-on-snow events. Flooding in the valley becomes a problem when human activities infringe on the natural floodplain. Two types of flooding primarily affect Yamhill County: riverine flooding and urban flooding. In addition, any low-lying area has the potential to flood. The flooding of developed areas may occur when the amount of water generated from rainfall and runoff exceeds a storm water system's (ditch or sewer) capability to remove it.

Riverine Flooding

Riverine flooding is the overbank flooding of rivers and streams. The natural processes of riverine flooding add sediment and nutrients to fertile floodplain areas. Flooding in large river systems typically results from large-scale weather systems that generate prolonged rainfall over a wide geographic area, causing flooding in hundreds of smaller streams, which then drain into the major rivers.

Shallow area flooding is a special type of riverine flooding. FEMA defines shallow flood hazards as areas that are inundated by the 100-year flood with flood depths of only one to three feet. These areas are generally flooded by low velocity sheet flows of water.

Urban flooding

As land is converted from fields or woodlands to roads and parking lots, it loses its ability to absorb rainfall. Urbanization of a watershed changes the hydrologic systems of the basin. Heavy rainfall collects and flows faster on impervious concrete and asphalt surfaces. The water moves from the clouds, to the ground, and into streams at a much faster rate in urban areas. Adding these elements to the hydrological systems can result in floodwaters that rise very rapidly and peak with violent force.

Almost one-eighth of the area in Yamhill County is incorporated and has a high concentration of impermeable surfaces that either collect water or concentrate the flow of water in unnatural channels. During periods of urban flooding, streets can become swift

¹⁷ Taylor, George H. and Chris Hannan. *The Oregon Weather Book*. Grants Pass, OR: Oregon State University Press. 1999

moving rivers and basements can fill with water. Storm drains often back up with vegetative debris causing additional, localized flooding.

Bank erosion

Erosion is a process that involves the gradual wearing away, transport, and movement of land. Not all erosion is gradual. It can occur quite quickly as the result of a flash flood, coastal storm, or other event. Erosion rarely causes death or injury, although it can cause significant destruction to property and infrastructure.

All of Yamhill County's 113 rivers and creeks are subject to erosion. Some of those potentially threatened by erosion include the Willamette, Wind, and North and South Yamhill Rivers; and Ash, Berry, Baker, Fairchild, Maroney, Perkins, Turner, Petch, Panther, and Willamina Creeks. DOGAMI has mapped the Yamhill River channel migration zone (see reports cited at the end of this section for more information).

Location and Extent

Yamhill County is in the Willamette River basin in northwestern Willamette Valley. Its western edge lies in the Coast Range and extends east to the Willamette River, west of the Cascade Mountain Range. Weather patterns generally move west to east where air masses from the Pacific Ocean rise over the Coast Range, cool, and become saturated. The Coast and Cascade ranges buffer the Willamette Valley from continental air moving westward.

Yamhill County is subject to flooding from overflowing rivers (Willamette, North Yamhill, and South Yamhill) and smaller tributaries (Ayers, Panther, Turner, Haskins, Fairchild, Mill, Willamina, Rock, and Agency creeks), and flooding from local storm water drainage.

Flooding is most common from October through April, when storms from the Pacific Ocean bring intense rainfall to the area. During the rainy season, monthly rainfall totals average far higher than other months of the year. This results in high water, particularly in December and January. The larger floods are the result of heavy rains of two-day to five-day durations augmented by snowmelt at a time when the soil is near saturation from previous rains. Frozen topsoil also contributes to the frequency of floods.

A large portion of Yamhill County's area lies in the lower Willamette River basin. The broad floodplain of the valley can be easily inundated by floodwaters. The surface material includes poorly drained, unconsolidated, fine-grained deposits of Willamette silt, sand, and gravel. Torrential flood events can introduce large deposits of sand and gravel that assist in the drainage of the otherwise poorly drained soils.

Floods can result in loss of life and property, with the extent of the damage dependent on the depth and velocity of the floodwaters. Floods are described in terms of their extent (including the horizontal area affected and the vertical depth of floodwaters) and the related probability of occurrence. Flood studies often use historical records, such as streamflow gauges, to determine the probability of occurrence for floods of different magnitudes.

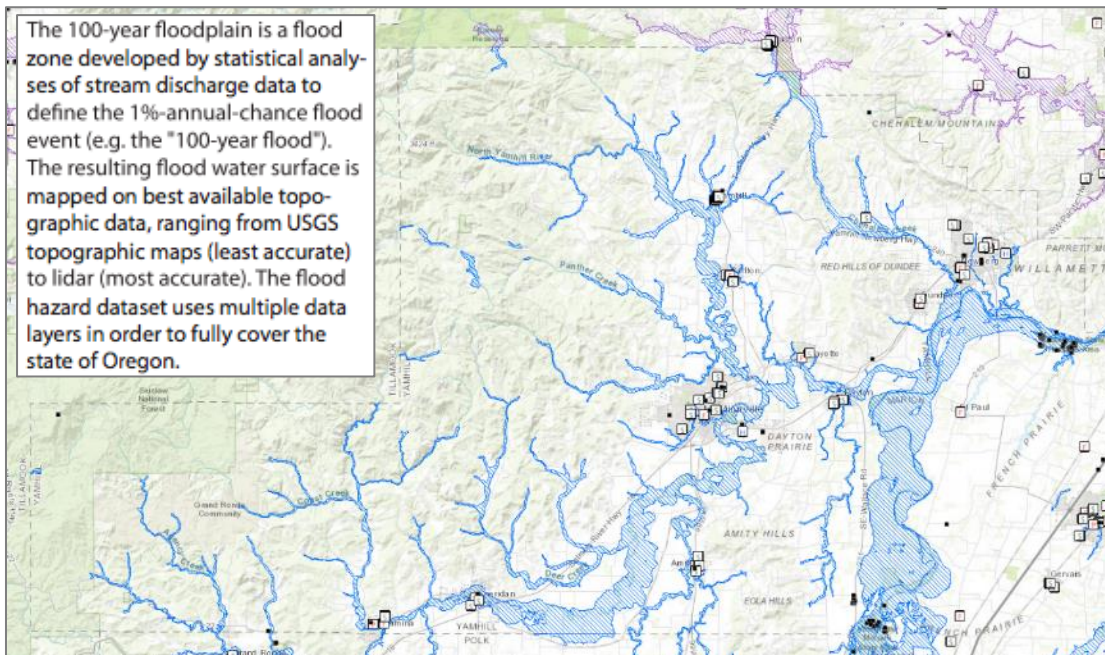
FEMA has mapped most of the flood-prone streams in Oregon for 100- and 500-year flood events. A 100-year flood (a flood with a 1-percent probability of occurring within any given year) is used as the standard for floodplain management in the United States and is referred to as a base flood. Flood Insurance Rate Maps (FIRMs) prepared by FEMA provide the most

readily available source of information for 100-year floods. These maps are used to support the NFIP. FIRMs delineate 100- and 500-year (a flood with a 0.2-percent probability of occurring within any given year) floodplain boundaries for identified flood hazards; these areas are Special Flood Hazard Areas (SFHAs) and provide the basis for flood insurance and floodplain management requirements. These maps represent a snapshot in time, and do not account for later changes which occurred in the floodplains. Development and other natural and artificial changes in the floodplain have caused changes to the rivers and streams in Yamhill County. Figure 2-9 provides an overview of the flood zones and extent in Yamhill County.

For detailed information, refer to the following Flood Insurance Study (FIS) and associated Flood Insurance Rate Maps (FIRMs):

- [Yamhill County FIS \(2010\)](#)
- [Yamhill County FIRMS \(2010\)](#)

Figure 2-9 Special Flood Hazard Area (100-year floodplain)



Source: [Oregon HazVu: Statewide Geohazards Viewer](#) – To view map in more detail click hyperlink to left.

An area totaling 66.2 square miles within the county is within the 100-year floodplain and an additional 3.5 square miles are within the 500-year floodplain. The 500-year floodplain generally encompasses slightly more area than a 100-year event. Each watershed has its own water absorption characteristics. Buildings, roads, and parks replace grass and soil limiting water absorption. Therefore, 500-year events contain more water, which spreads further throughout the floodplain until the water can be managed by manmade and natural drainage systems.

Historic data indicates flood depths exceeding flood levels by one foot on the Willamette River (crested at 29 feet) and levels by five feet on the South Yamhill River (crested at 55 feet).

The FEMA FIRMs provide a comprehensive analysis of the 100- and 500-year floodplains. The maps cover the entire geographic extent of Yamhill County and therefore include small waterways, reservoirs and less densely populated areas that were not included in previous editions of the FIRMs.

Floods are described in terms of their extent (including the horizontal area affected and the vertical depth of floodwaters) and the related probability of occurrence. Flood studies often use historical records, such as streamflow gages, to determine the probability of occurrence for floods of different magnitudes. The probability of occurrence is expressed in percentages as the chance of a flood of a specific extent occurring in any given year.

The magnitude of flood used as the standard for floodplain management in the United States is a flood having a one percent probability of occurrence in any given year. This flood is also known as the 100-year flood or base flood. The most readily available source of information regarding the 100-year flood is the system of Flood Insurance Rate Maps (FIRMs) prepared by FEMA. These maps are used to support the National Flood Insurance Program (NFIP). The FIRMs show 100-year floodplain boundaries for identified flood hazards. These areas are also referred to as Special Flood Hazard Areas (SFHAs) and are the basis for flood insurance and floodplain management requirements. In 2008 FEMA undertook an update of all FIRMs in Yamhill County as part of a recalibration of the datum for measuring elevation into the Digital FIRM (DFIRM) format.

Additional reports are available via FEMA's Flood Map Service Center website:

<https://msc.fema.gov/portal>

Refer to the following DOGAMI reports for additional information:

- Statewide subbasin-level channel migration screening (2017, [IMS-56](#)).

Additional reports are available via DOGAMI's Publications Search website:

<https://www.oregongeology.org/pubs/pubsearch.htm>

Other agency/ consultant reports:

- [Engineering with Nature: Alternative Techniques to Riprap Bank Stabilization.](#)

History

The Willamette, North Yamhill, and South Yamhill rivers and smaller tributaries are susceptible to annual floods.

The Willamette River has flooded on many occasions with the largest flood in 1861. In 1880 another large flood damaged the Yamhill River Bridge and washed out portions of the Willamette Valley Railroad's track. Flood control dams constructed in the 1940s and 1950s have changed the flooding pattern. The largest and most damaging was the 1964 flood, which FEMA categorized as a 100-year flood event. The following list summarizes significant flood events since 1964 in Yamhill County.

December 1964-January 1965. (DR-184; 12/24/1964) Two storm systems brought record rainfall to the region that had already experienced record, early season low-elevation snow. In Yamhill County, the flooding caused 10 deaths and hundreds of landslides, washed out

roads and bridges, and damaged or destroyed houses. Thousands evacuated and the entire state was declared a disaster area.

January 1974. (DR-413; 1/25/1974) Snowmelt caused by a series of storms combined with heavy snow and freezing rain to produce rapid runoff. Several roads were closed because of landslides and high water including some roads in Sheridan and Willamina. In several communities along the Willamette River, wastewater plants exceeding capacity discharged raw sewage into the river. February 1986. The flood was caused by heavy rains and snow melt. The Willamette River crested at 29 feet and was within inches of flooding. Homes were flooded and highways closed.

February 1996. (DR-1099; 2/9/1996) A series of floods were caused by deep snow pack, warm temperatures, and record-breaking rain. The City of Carlton's wastewater treatment plant overflowed into the North Yamhill River. Total damages in the county exceeded \$4 million.

November 1996. A warm weather system deposited heavy rain on the area causing flooding. La Niña was observed in 1996-1997.

December 1996. (DR-1160; 1/23/1997, Yamhill not included) Heavy rains caused flooding throughout the county. Willamette River crested at 29 feet, one foot above flood level. The South Yamhill River at McMinnville crested at 55 feet, five feet above flood level. Five thousand residents lost power when high winds damaged power lines. La Niña was observed in 1996-1997.

December 2005. (DR-1632; 3/20/2006) Severe storms, flooding, landslides, and mudslides occurred between December 18, 2005 and January 21, 2006.

December 2006. (DR-1683; 2/2/2007) Severe winter storm and flooding occurred between December 14 and 15, 2006.

December 2007. (DR-1733; 12/8/2007) Severe storms, winds, mudslides, landslides, and flooding occurred between December 1 and 17, 2007 shutting down roads and highways including Interstate 5. Public infrastructure, homes, and personal property were damaged. In Oregon, 73,000 residents were without power, and wastewater treatment plants were overwhelmed. A major disaster was declared for the State of Oregon on December 8, 2007 with Yamhill County included in the declaration. Yamhill County suffered the loss of the south approach fill at Ayers Creek Bridge on North Valley Road.

December 2008. (DR-1824; March 2, 2009) Severe winter storm, record and near record snow, landslides, and mudslides occurred between December 13 and 26, 2008. FEMA statewide disaster aid was estimated at approximately \$20 million.

January 2009. Heavy rains on New Year's Eve caused the South Yamhill River to crest to 16 feet, a level not seen since 1964. The Governor declared Yamhill County and several other Oregon counties in a state of emergency. Major roads throughout the county were closed because of flooding or adjacent high river waters. Street runoff caused flooding issues at many residences including cutting off access to homes and inundation of crawl spaces. Damage to about 24 homes caused residents to evacuate.

January 17-21, 2012. Heavy rains and snow melt caused water bodies throughout Yamhill County to flood. The Yamhill River crested at 55 feet, four feet above flood level causing

highway and local road closures, the closure of the Wheatland Ferry across the Willamette River, water damage & flooding to homes, and farmland flooding. Water infrastructure and supply was also compromised including clogged storm drains, overwhelmed wastewater treatment facilities and water loss after a pond edge gave way. Schools and college campuses closed early and cancelled classes.

January 2014. Heavy rains caused flooding throughout Yamhill County. Impacts were similar to impacts of the January 2012 storms.

December 2015. (DR-4258; 2/17/2016) Heavy rains caused flooding throughout Yamhill County from December 6 to 23, 2015.

December 2020. Heavy rain caused the South Yamhill River near McMinnville to flood. The river crested at 50.15 feet, which is 0.15 feet above flood stage.

Probability Assessment

Based on the available data and research the Steering Committee determined the **probability of experiencing a flood is “high”**, meaning one incident is likely within the next 10 to 35-year period

Flood studies use this information to determine the probability of flood occurrence of different magnitudes. The probability of occurrence is expressed as a percentage indicating the probability of a specific flood event occurring in any given year.

Factors contributing to the frequency and severity of riverine flooding include:

- Rainfall intensity and duration
- Antecedent moisture conditions
- Watershed conditions, including steepness of terrain, soil types, amount and type of vegetation, and density of development
- The existence of attenuating features in the watershed, including natural features such as swamps and lakes, and human-built features such as dams
- The existence of flood control features, such as levees and flood control channels
- Velocity of flow
- Tide heights and storm surge
- Availability of sediment for transport, and the erodibility of the bed and banks of the watercourse

These factors are evaluated using a hydrologic analysis to determine the probability that discharge of a certain size will occur, and to determine the characteristics and depth of the flood resulting from that discharge.

Yamhill County has a wide range of climate and elevations with average monthly precipitation ranging from approximately fourteen inches in the highest elevations to five inches in lower elevations. Floods are most common in Yamhill County from October through April when storms from the Pacific Ocean bring intense rainfall. Based on previous occurrences, flood events are likely to occur around the county every one to ten years. Climate change will likely be an influencing factor for future flood probabilities. Long-term modeling suggests increases in annual average temperatures may translate in the Pacific Northwest to less total accumulated snow pack as winter precipitation falls as rain. This may

result in faster storm runoff with flashier flood events for upper watersheds and the need for greater attention to storm water management in floodplains.¹⁸

Vulnerability Assessment

The Steering Committee rated the county as having a **“High” vulnerability to flood hazards**, meaning that greater than 10% of the unincorporated County’s population or assets would be affected by a major flood event.

A floodplain vulnerability assessment combines the floodplain boundary, generated through hazard identification, with an inventory of the property within the floodplain. Understanding the population and property exposed to natural hazards will assist in reducing risk and preventing loss from future events.

Yamhill County development regulations restrict, but do not prohibit, new development in areas identified as floodplain. This reduces the impact of flooding on future buildings. As new land has been brought into the regional Urban Growth Boundary, the applicable development codes have been applied to prevent the siting of new structures in flood prone areas.

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 the county 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, from channel migration, or from local storm water drainage.

National Flood Insurance Program (NFIP)

FEMA updated the Flood Insurance Study (FIS) and Flood Insurance Rate Maps (FIRMs) in 2010 (effective March 2, 2010). Yamhill County’s (unincorporated) last Community Assistance Visit (CAV) was initiated July 22, 2011. Yamhill County, and all cities within the County actively participate in the NFIP and have implemented floodplain policies, regulations, and ordinances to protect their threatened population and infrastructure to assure NFIP compliance. Table 2-8 shows that most flood insurance policies are for residential structures, primarily single-family homes. There are 82 National Flood Insurance Program (NFIP) policies in force within the unincorporated portion of the County. Of those, 38 are for properties that were developed before adoption of the initial FIRMs.

Flood insurance covers only the improved land, or the actual building structure. There have been 26 paid claims as of August 2019 (21 pre-FIRM) in the unincorporated County totaling \$361,265. Yamhill County and its incorporated cities have 446 National Flood Insurance Program (NFIP) policies, representing over \$100 million in coverage.

The NFIP’s Community Rating System (CRS) recognizes jurisdictions for participating in floodplain management practices that exceed NFIP minimum requirements. The City of Sheridan has exceeded NFIP minimum requirements to receive a Community Rating System (CRS) rating of “9” The remainder of Yamhill County and the incorporated jurisdictions do

¹⁸ Mote, P.W., J. Abatzoglou, K.D. Dello, K. Hegewisch, and D.E. Rupp, 2019: Fourth Oregon Climate Assessment Report. Oregon Climate Change Research Institute. occri.net/ocar4.

not have a CRS rating and do not receive discounted flood insurance premiums for residents in a special flood hazard zone.

Table 2-8 Flood Insurance Detail

	Yamhill County	Unincorporated Yamhill County
Effective FIRM and FIS	3/2/2010	3/2/2010
Initial FIRM Date	-	9/30/1983
Total Policies	446	82
Pre-FIRM Policies	153	38
Policies by Building Type		
Single Family	401	78
2 to 4 Family	14	1
Other Residential	10	0
Non-Residential	21	3
Minus Rated A Zone	72	8
Insurance in Force	\$100,617,300	\$19,818,900
Total Paid Claims	81	26
Pre-FIRM Claims Paid	68	21
Substantial Damage Claims	3	0
Total Paid Amount	\$1,166,076	\$361,265
Repetitive Loss Structures	4	3
Severe Repetitive Loss Properties	1	1
CRS Class Rating	-	NP
Last Community Assistance Visit	-	7/22/2011

Source: Department of Land Conservation and Development, August 2019. Repetitive Flood Loss information provided by FEMA correspondence on September 10, 2020. NP = Not Participating

Repetitive Loss Properties:

Yamhill County works to mitigate problems regarding flood issues when they arise. Some areas in the county are more susceptible to flooding issues and have incurred repetitive losses. The community repetitive loss record for unincorporated Yamhill County identifies three (3) Repetitive Loss Properties¹⁹, of which one (1) is considered a Severe Repetitive Loss Property²⁰. All repetitive loss properties are single-family residences.

Repetitive loss and severe repetitive loss properties are troublesome because they continue to expose lives and valuable property to the flooding hazard. Local governments as well as

¹⁹ 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.

²⁰ 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.

federal agencies such as FEMA attempt to address losses through floodplain insurance and attempts to remove the risk from repetitive loss properties through projects such as acquiring land and improvements, relocating homes or elevating structures. Continued repetitive loss claims from flood events lead to an increased amount of damage caused by floods, higher insurance rates, and contribute to the rising cost of taxpayer funded disaster relief for flood victims. Substantially damaged buildings located in the Special Flood Hazard Area do not require benefit-cost analysis to qualify for mitigation funds.

Landslide

Significant Changes since Previous NHMP:

New landslide susceptibility information based on updated Lidar data provided by DOGAMI (O-16-02) has also been included.

Characteristics

A landslide is any detached mass of soil, rock, or debris that falls, slides or flows down a slope or a stream channel. Landslides are classified according to the type and rate of movement and the type of materials that are transported. In a landslide, two forces are at work: 1) the driving forces that cause the material to move down slope, and 2) the friction forces and strength of materials that act to retard the movement and stabilize the slope. When the driving forces exceed the resisting forces, a landslide occurs.

Yamhill County is subject to landslides or debris flows (mudslides), especially in the Coast Range/Salem Hills in the western portion of the county, which may affect buildings, roads and utilities.

Additionally, landslides often occur together with other natural hazards, thereby exacerbating conditions, as described below:

- Shaking due to earthquakes can trigger events ranging from rockfalls and topples to massive slides.
- Intense or prolonged precipitation that causes flooding can also saturate slopes and cause failures leading to landslides.
- Landslides into a reservoir can indirectly compromise dam safety and a landslide can even affect the dam itself.
- Wildfires can remove vegetation from hillsides, significantly increasing runoff and landslide potential.

Location and Extent

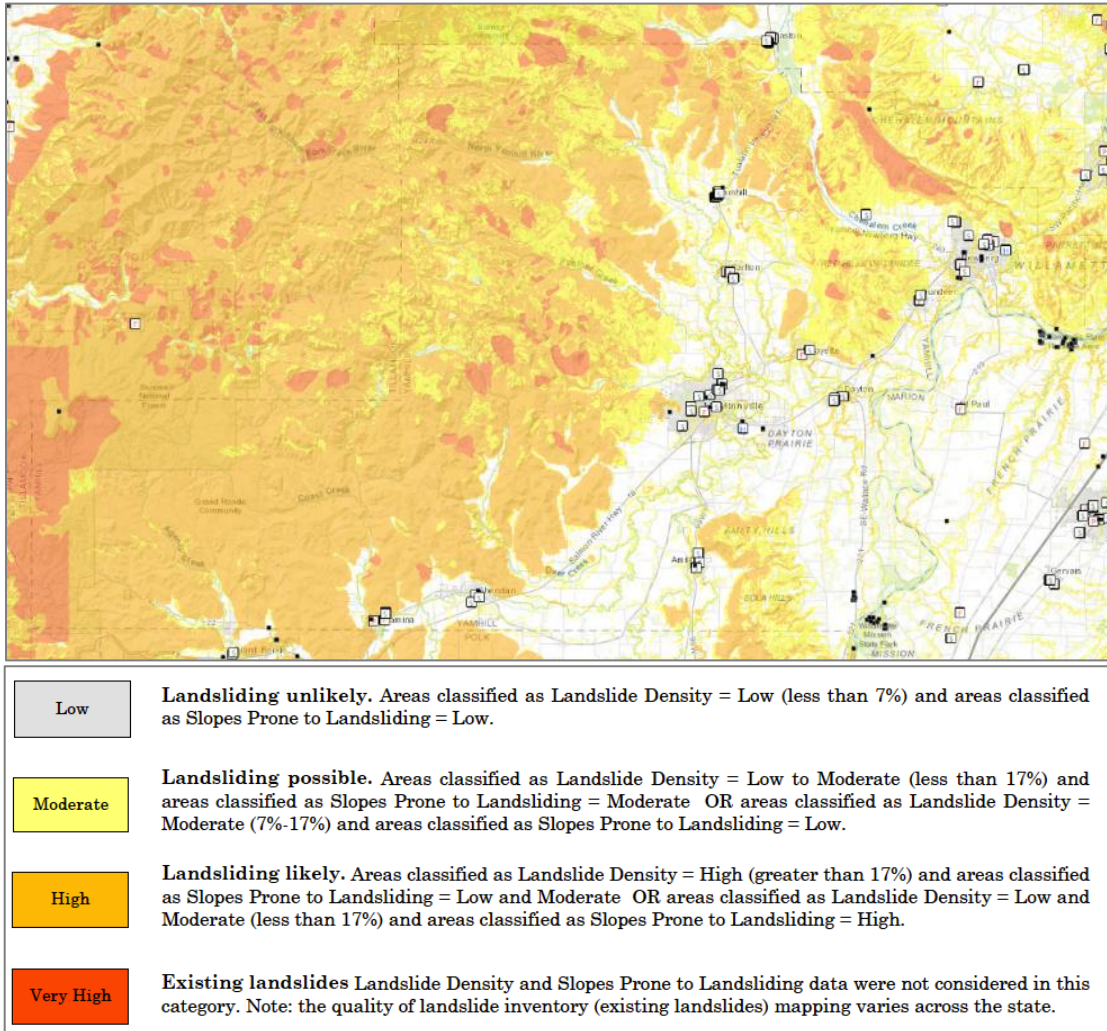
In Yamhill County, DOGAMI reports the slopes nearest to the Willamette River, in the western portion of the Salem Hills, are at greatest risk of landslides (Figure 2-10). Weak, low-permeability marine sediments overlain by basalts, and clay rich residual soils overlying basalts are susceptible to water-induced landslides on steep slopes and within existing slide masses. Features such as hummocky topography, disrupted drainage patterns, sag ponds, springs, back-tilted bedrock blocks, and subdued head scarps are indicative of landslide terrain. For Yamhill County, most landslide areas are found in less populated western hills of Yamhill County, historic landslide areas are also present in or adjacent to urban areas. These areas include:

- Two sites in McMinnville: one at the southern end of SE Evans Street, just south of downtown and the second just north of the Linfield College campus;
- One site at the intersection of Hwy 99 and 233 just north of Amity;
- Four sites east of the City of Yamhill on NE Hwy 240
- One just east of the outlet to the Hickory Hill Farm Reservoir and on NE Hwy 240, west of Newberg;

- And three sites east of Dundee on the Yamhill County side of the Willamette River.

Landslides in these areas could cause disruptions in transportation and potable water systems.

Figure 2-10 Landslide Susceptibility Exposure



Source: [Oregon HazVu: Statewide Geohazards Viewer](#) – To view map in more detail click hyperlink to left.

More detailed landslide hazard assessment at specific locations requires a site-specific analysis of the slope, soil/rock and groundwater characteristics at a specific site. Such assessments are often conducted prior to major development projects in areas with moderate to high landslide potential, to evaluate the specific hazard at the development site.

Table 2-9 shows landslide susceptibility exposure for Yamhill County and the incorporated cities. Approximately 52% of the county has high or very high landslide susceptibility exposure. These are concentrated in areas of high slopes, and close to river valleys (see Figure 2-10). In general cities within the County have a lower landslide susceptibility exposure than does the unincorporated area of the County, except Willamina (see Volume II for more information on each city's exposure). *Note that even if a County or City has a high*

percentage of area in a high or very high landslide exposure susceptibility zone, this does not mean there is a high risk, because risk is the intersection of hazard and assets.

The severity or extent of landslides is typically a function of geology and the landslide triggering mechanism. Rainfall initiated landslides tend to be smaller and earthquake induced landslides may be very large. Even small slides can cause property damage, result in injuries or take lives.

Table 2-9 Landslide Susceptibility Exposure

Jurisdiction	Area, ft ²	Low	Moderate	High	Very High
Yamhill County	20,024,032,738	26.4%	21.2%	46.9%	5.5%
Amity	17,399,913	81.3%	14.6%	4.1%	0.0%
Carlton	24,865,027	62.8%	32.8%	4.5%	0.0%
Dayton	21,139,259	71.1%	18.7%	10.2%	0.0%
Dundee	38,346,886	59.7%	34.0%	6.3%	0.0%
Lafayette	24,326,932	52.1%	36.9%	11.0%	0.0%
McMinnville	293,827,529	80.1%	12.3%	7.5%	0.0%
Newberg	162,397,179	74.7%	20.1%	4.9%	0.3%
Sheridan	54,273,946	80.5%	14.0%	5.5%	0.0%
Willamina	26,402,748	26.2%	8.3%	65.5%	0.0%
Yamhill	14,049,006	73.4%	25.1%	1.4%	0.0%

Source: DOGAMI [Open-File Report, O-16-02](#), Landslide Susceptibility Overview Map of Oregon (2016)

For more information, refer to the following report and maps provided by DOGAMI:

- Preparing for Landslide Hazards, A Land Use Guide for Oregon Communities (October 2019) [Link](#)
- Statewide Landslide Susceptibility (2016, [O-16-02](#)).
- Landslide Susceptibility of Lifeline Routes in the Oregon Coast Range (2015, [O-15-01](#))
- Landslide inventory maps of the Sherwood quadrangle (2012, [IMS-50](#))
- Geologic hazards, earthquake and landslide hazard maps for counties in the Mid/Southern Willamette Valley (2008, [IMS-24](#))
- Slope failures in Oregon: GIS inventory for three 1996/97 storm events (2000, [Special Paper 34](#)).
- Storm Impacts and Landslides of 1996: [Final Report](#)

Additional reports are available via DOGAMI’s Publications Search website: <http://www.oregongeology.org/pubs/search.php>

History

Landslides may happen at any time of the year. In addition to landslides triggered by a combination of slope stability and water content, earthquakes may also trigger landslides. Areas prone to seismically triggered landslides are generally the same as those prone to ordinary (i.e., non-seismic) landslides. As with ordinary landslides, seismically triggered landslides are more likely for earthquakes that occur when soils are saturated with water.

Debris flows and landslides are a very common occurrence in hilly areas of Oregon, including portions of Yamhill County. Many landslides occur in undeveloped areas and thus may go

unnoticed or unreported. For example, DOGAMI conducted a statewide survey of landslides from four winter storms in 1996 and 1997 and found 9,582 documented landslides, with the actual number of landslides estimated to be many times the documented number. For the most part, landslides become a problem only when they impact developed areas and have the potential to damage buildings, roads or utilities.

Oregon Department of Geology and Mineral Industries (DOGAMI) reports fewer landslides in the Willamette Valley than in the Cascade or Oregon Coast mountain ranges, however, southern Yamhill County and the edges of the valley are susceptible because of the occurrence of marine sedimentary rock and clay-rich residual soils overlying basalts. Yamhill County does not have a comprehensive list of landslide events, but they likely occur during major storms in western Oregon. Major landslides were reported in 1964, 1966, 1982, 1996, 2006, 2007, 2008, and 2015 during winter storms and flood events. Two winter storms in November 1996 triggered over 9,500 landslides and debris flows on logged and un-logged land mostly in the Cascade and Oregon Coast mountain ranges.

A severe storm in December 2008 resulted in record and near-record snow, mudslides, and landslides and a disaster declaration for Yamhill County.

In March of 2012 in Sheridan there was a water break on the Stoney Mountain Transmission Line caused by a 200'-300' landslide on a hill located between Canyon Road and Richard Street. In 2014, landslides in Buck Hollow (near Willamina) partly closed adjacent roads.

Figure 2-11 shows the landslide inventory for Yamhill County and the [Statewide Landslide Information Database for Oregon](#).

Probability Assessment

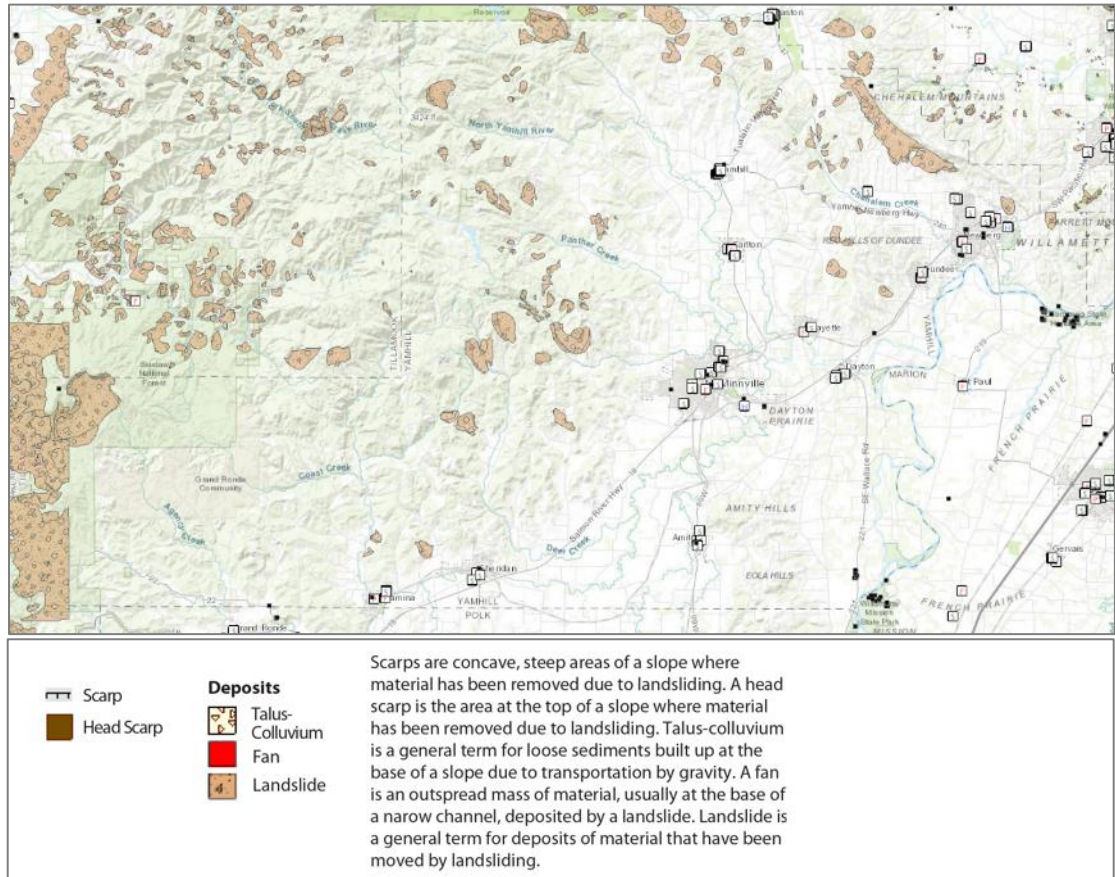
Based on the available data and research the Steering Committee determined the **probability of experiencing a landslide or debris flow is “high”**, meaning at least one incident is likely within the next 10 to 35-year period.

The probability of rapidly moving landslide occurring depends on several factors, including steepness of slope, slope materials, local geology, vegetative cover, human activity and water. There is a strong correlation between intensive winter rainstorms and the occurrence of rapidly moving landslides (debris flows). Consequently, the National Weather Service tracks storms during the rainy season, monitors rain gauges and snow melt and issues warnings as conditions warrant. Given the correlation between precipitation, snowmelt and rapidly moving landslides, it would be feasible to construct a probability curve. The installation of slope indicators or the use of more advanced measuring techniques could provide information on slower moving slides.

Geo-engineers with DOGAMI estimate widespread landslides about every 20 years; landslides at a local level can be expected every two or three years.²¹

²¹Mills, K. 2002. Oregon's Debris Flow Warning System. Cordilleran Section-98th Annual Meeting. Corvallis.

Figure 2-1 | Landslide Inventory



Source: [Oregon HazVu: Statewide Geohazards Viewer](#) – To view map in more detail click hyperlink to left.

Vulnerability Assessment

The Steering Committee rated the County as having a **“low” vulnerability to landslide hazards**, meaning that less than 1% of the unincorporated County’s population or assets would be affected by a major disaster.

To a large degree, landslides are very difficult to predict. At the time of this update, enough data was not available to determine landslide vulnerability in terms of the population and total value of property at risk from future landslide occurrences.

Landslides can impact major transportation arteries, blocking residents from essential services and businesses. Many aspects of the county are vulnerable to landslides. This includes land use and development patterns, the economy, population segments, ecosystem services and cultural assets.

A quantitative landslide hazard assessment requires overlay of landslide hazards (frequency and severity of landslides) with the inventory exposed to the hazard (value and vulnerability) by considering:

- Extent of landslide susceptible areas;
- Inventory of buildings and infrastructure in landslide susceptible areas;
- Severity of earthquakes or winter storm event (inches of rainfall in 24 hours);

- Percentage of landslide susceptible areas that will move and the range of movements (displacements) likely; and
- Vulnerability (amount of damage for various ranges of movement).

Roads and Bridges

Large losses incurred from landslide hazards in Yamhill County have been associated with roads. The Yamhill County Public Works Department is responsible for responding to slides that inhibit the flow of traffic or are damaging a road or a bridge. The department does its best to communicate with residents impacted by landslides, but can usually only repair the road itself, as well as the areas adjacent to the slide where the county has the right of way.

It is not cost effective to mitigate all slides because of limited funds and the fact that some historical slides are likely to become active again even with mitigation measures. The Public Works Department alleviates problem areas by grading slides, and by installing new drainage systems on the slopes to divert water from the landslides. This type of response activity is often the most cost-effective in the short-term but is only temporary. Unfortunately, many property owners are unaware of slides and the dangers associated with them.

Severe Weather (Windstorm and Winter Storm)

Severe wind events may occur throughout Oregon during all seasons. Often originating in the Pacific Ocean, westerly winds pummel the coast, slowing as they cross the Coastal mountain range and head into the inland valleys.²² Similarly, severe winter storms consisting of rain, freezing rain, ice, snow, cold temperatures, and wind originate from troughs of low pressure offshore in the Gulf of Alaska or in the central Pacific Ocean that ride along the jet stream during fall, winter, and early spring months.²³ In summer, the most common wind directions are from the west or northwest; in winter, they are from the south and east. Local topography, however, plays a major role in affecting wind direction. For example, the north-south orientation of the Willamette Valley channels the wind most of the time, causing predominately north and south winds.

Climate Change Factors

Oregon and the Pacific Northwest experience a variety of extreme weather incidents ranging from severe winter storms and floods to drought and dust storms, often resulting in morbidity and mortality among people living in the impacted regions. According to the Oregon Climate Change Research Institute, climate change is expected to increase the frequency and intensity of some weather incidents.²⁴

Climate change poses risks for increased injuries, illnesses and deaths from both direct and indirect effects. Incidents of extreme weather (such as floods, droughts, severe storms, heat waves and fires) can directly affect human health as well as cause serious environmental and economic impacts. Indirect impacts can occur when climate change alters or disrupts natural systems.

Future Climate Variability²⁵

Climate models for Oregon suggest, future regional climate changes include increases in temperature around 0.2-1°F per decade in the 21st Century, along with warmer and drier summers, and some evidence that extreme precipitation will increase in the future. Increased droughts may occur in the Willamette Valley under various climate change scenarios because of various factors, including reduced snowpack, rising temperatures, and likely reductions in summer precipitation. Climate models suggest that as the region warms, winter snow precipitation will likely shift to higher elevations and snowpack will be diminished as more precipitation falls as rain altering surface flows.

²² US Department of Agriculture. <http://www.fsa.usda.gov/or/Notice/Flp104.pdf>

²³ Interagency Hazard Mitigation Team. 2000. State Hazard Mitigation Plan. Salem, OR: Oregon Office of Emergency Management

²⁴ Oregon Climate Change Research Institute <http://occri.net/wp-content/uploads/2011/04/chapter9ocar.pdf> Page 412

²⁵ Oregon Climate Change Research Institute (OCCRI), 4th Oregon Climate Assessment Report (2019) and Northwest Climate Assessment Report (2013). <http://www.occri.net/publications-and-reports/publications/>

Windstorm

Significant Changes since Previous NHMP:

The windstorm hazard section has been edited to reference new history since the previous NHMP.

Characteristics

A windstorm is generally a short duration event involving straight-line winds and/or gusts in excess of 50 mph. Although windstorms can affect the entirety of Yamhill County, they are especially dangerous near developed areas with large trees or tree stands. The extent of any windstorm is determined by its track, intensity and local terrain.²⁶ In the southwest Oregon, wind speed is typically 60 mph for 25-year storm events, 70 mph for 50-year storm events and 80 mph for 100-year storm events. Yamhill County has experienced multiple 25-, 50- and 100-year windstorm events over the past century with impacts often occurring countywide. A windstorm will frequently knock down trees and power lines, damage homes, businesses, public facilities and create tons of storm related debris. Windstorms are a common, chronic hazard in Yamhill County.

Location and Extent

The most common type of wind pattern affecting Yamhill County is straight-line winds, which originate as a downdraft of rain-cooled air and reach the ground and spread out rapidly. Straight-line winds can produce gusts of 100 mph or greater. Records of major Pacific windstorms are documented by state agencies and weather stations throughout Oregon, including several official weather stations in Yamhill County's lower valleys. Table 2-10 shows the expected wind speeds from windstorm events in Yamhill County.

Yamhill County in the Willamette Valley is somewhat sheltered from strong westerly winds, as the north-south orientation of the Coast Range and Cascades obstructs and slows down these surface winds. The north-south orientation of the Willamette Valley often channels the winds in a north south direction. Winds blowing along a north to south axis, parallel to the major mountain ranges, can prove to be extremely destructive. Regardless of wind direction, prolonged windstorms are likely to last an average of three to six hours before moving on. High winds are likely to occur during the months of October through April. Although windstorms can affect the entirety of the county, they are especially dangerous in developed areas with significant tree stands and major infrastructure, especially above ground utility lines. A windstorm will frequently knock down trees and power lines, damage homes, businesses, public facilities and create tons of storm related debris.

History

The most destructive windstorm ever recorded in Oregon, in terms of loss of life and property damage, was the Columbus Day storm of 1962. Damage was most severe in the Willamette Valley. The storm killed thirty-eight people and did upwards of \$200 million in damage (over \$1.7 billion in today's dollars). Hundreds of thousands of homes were without power for short periods of time, while others were without power for two to three weeks.

²⁶ State of Oregon Natural Hazard Mitigation Plan (2015)

More than 50,000 homes were seriously damaged, and nearly 100 were destroyed. The storm destroyed fruit and nut orchards and killed scores of livestock. Intense wind speeds were recorded in the metropolitan areas with gusts of 116 mph on Portland’s Morrison Bridge.

Yamhill County has experienced several high wind events. A regional storm in early December 2007 that required a federal disaster declaration along the Oregon Coast brought high winds and heavy rain to the County.

Yamhill county has experienced one tornado in the past ten years. On June 13, 2013 an EF1 tornado touched down in McMinnville causing downed power lines and traffic disruptions due to debris in roadways. Building damage was observed on four McMinnville buildings. A tornado has not been recorded in Yamhill County since the previous plan update.

Several additional, small windstorm events have occurred since the previous NHMP, see the [Storm Events Database](#) provided by the National Oceanic and Atmospheric Administration for more information. According to historical records, there have been an estimated six major windstorm events in the past 100 years, which is about one every 16-17 years.

Probability Assessment

Based on the available data and research the Steering Committee determined the **probability of experiencing a windstorm is “high”**, meaning one severe incident is likely within the next ten to 35-year period.

Windstorms in the county usually occur in the winter from October to March and their extent is determined by their track, intensity (the air pressure gradient they generate) and local terrain. Summer thunderstorms may also bring high winds along with heavy rain and/or hail. The National Weather Service uses weather forecast models to predict oncoming windstorms, while monitoring storms with weather stations in protected valley locations throughout Oregon.

Table 2-10 shows the wind speed probability intervals that structures 33 feet above the ground would expect to be exposed to within a 25, 50 and 100-year period. The table shows that structures in Region 2, which includes Yamhill County, can expect to be exposed to 65 mph winds in a 25-year recurrence interval (4% annual probability).

Table 2-10 Probability of Severe Wind Events (Region 2)

	25-Year Event (4% annual probability)	50-Year Event (2% annual probability)	100-Year Event (1% annual probability)
Region 2:			
North Willamette Valley	65 mph	72 mph	80 mph

Source: Oregon State Natural Hazard Mitigation Plan, 2012

Vulnerability Assessment

The Steering Committee rated the county as having a **“moderate” vulnerability to windstorm hazards**, meaning that between one and ten percent of the unincorporated County’s population or assets would be affected by a major disaster.

Many buildings, utilities and transportation systems within Yamhill County are vulnerable to wind damage. This is especially true in open areas, such as natural grasslands or farmlands. It is also true in forested areas, along tree-lined roads and electrical transmission lines and on residential parcels where trees have been planted or left for aesthetic purposes. Structures most vulnerable to high winds include insufficiently anchored manufactured homes and older buildings in need of roof repair.

Fallen trees are especially troublesome. They can block roads and rails for long periods of time, impacting emergency operations. In addition, up-rooted or shattered trees can down power and/or utility lines and effectively bring local economic activity and other critical facilities to a standstill. Much of the problem may be attributed to a shallow or weakened root system in saturated ground. In Yamhill County, trees are more likely to blow over during the winter (wet season).

More information on this hazard can be found in the [Risk Assessment for Region 3, Mid/Southern Willamette Valley, of the Oregon NHMP \(2015\)](#).

Winter Storm

Significant Changes since Previous NHMP:

The winter storm hazard section has been edited to reference new history since the previous NHMP.

Characteristics

Winter storms occurring in Yamhill County result in several natural hazards— including floods, landslides/debris flows, snow, ice and wind. Each on its own, or in combination, can completely immobilize emergency response activities, close down transportation corridors, and disrupt transportation and utilities. Each of these natural hazards is individually discussed in detail in their respective sections.

Winter storms in Yamhill County can bring rain as well as snow or can be followed by rising temperatures that melt newly fallen snow. Either scenario often causes flooding; most floods in western Oregon occur as a result of winter storms. The flood hazard is described in detail in flood section of this document.

As is the case with flood, wind as a hazard in Yamhill County most frequently occurs as part of a winter storm. The nature, history, location, extent, and probability of future events for wind, including winter storm wind, are explored in detail in the wind section of this plan.

The winter storms that affect Yamhill County typically are not local events affecting only small geographic areas. Rather, winter storms are usually large cyclonic low-pressure systems that move in from the Pacific Ocean and affect large areas of Oregon and/or the whole Pacific Northwest. These storms are most common from October through March.

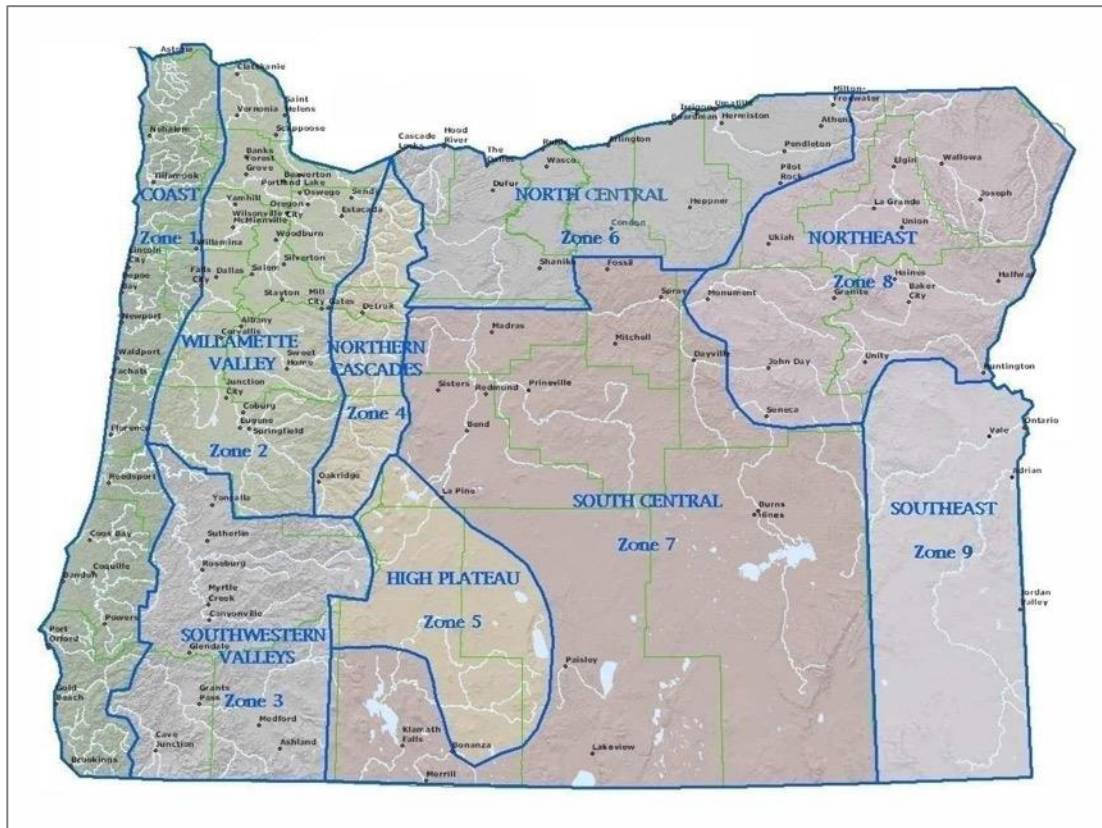
Ice storms are comprised of cold temperatures and moisture, but subtle changes can result in varying types of ice formation which may include freezing rain, sleet and hail. Of these, freezing rain can be the most damaging of ice formations.

Outside of mountainous areas, significant snow accumulations are much less likely in western Oregon than on the east side of the Cascades. A natural break in the Cascade Mountains sometimes allows cold air from the east to funnel through the Columbia Gorge into the Portland area, which can eventually settle south to the Willamette Valley, and thus create snow and ice events.

Location and Extent

The National Climatic Data Center has established climate zones in the United States for areas that have similar temperature and precipitation characteristics. Oregon’s latitude, topography and proximity to the Pacific Ocean give the state diversified climates. Figure 2-12 shows that Yamhill County is located within Zone 1: Coast and Zone 2: Willamette Valley. Winter storm events have relatively predictable and longer speeds of onset and the effects of winter storms are often long lasting.

Figure 2-12 Oregon Climate Divisions



Source: Oregon Climate Service

The principal types of winter storms that occur include:

- **Snowstorms:** require three ingredients: cold air, moisture and air disturbance. The result is snow, small ice particles that fall from the sky. In Oregon, the further inland and north one moves, the more snowfall can be expected. Blizzards are included in this category.
- **Ice storms:** are a type of winter storm that forms when a layer of warm air is sandwiched by two layers of cold air. Frozen precipitation melts when it hits the

warm layer and refreezes when hitting the cold layer below the inversion. Ice storms can include sleet (when the rain refreezes before hitting the ground) or freezing rain (when the rain freezes once hitting the ground).

- **Extreme Cold:** Dangerously low temperatures accompany many winter storms. This is particularly dangerous because snow and ice storms can cause power outages, leaving many people without adequate heating.

Unlike most other hazards, it is not simple to systematically map winter storm hazard zones. The entire County is susceptible to damaging severe weather. Winter storms that bring snow and ice can impact infrastructure, business and individuals. Those resources that exist at higher elevations will experience more risk of snow and ice, but the entire County can face damage from winter storms and, for example, the hail or life threateningly cold temperatures that winter storms bring.

History

Winter storms occur yearly; more destructive storms occur once or twice per decade, most recently in 2015.²⁷ More recent winter storm events occurred in 2016, 2017, and 2019, however, these winter storm events did not lead to a disaster declaration within the County.

Downed trees disrupted power to several portions of the county, leaving many residents without heat or water for several days. Residential care facilities, home-bound ill personnel requiring daily treatment, hospital patients, and anyone requiring emergency assistance was affected by this winter storm because obstructed roadways prevented emergency vehicle movement. The damage to fire stations, equipment, roads, and other infrastructure affected the ability to effectively respond, as well as reducing the operating budgets of these facilities.

Probability Assessment

Based on the available data and research the Steering Committee determined the **probability of experiencing a winter storm is “high”**, meaning one incident is likely within the next ten to 35-year period.

The recurrence interval for a moderate to severe winter storm is about once every year; however, there can be many localized storms between these periods. Severe winter storms occur in western Oregon regularly from November through February. Yamhill County experiences moderate winter storms every year to every other year, more damaging winter storms happen less often. According to historical records, there have been an estimated 16 severe winter storm events in the past 100 years, which is about one every six years.

Vulnerability Assessment

The Steering Committee rated the County as having a **“high” vulnerability to winter storm hazards**, meaning that greater than 10% of the unincorporated County’s population or assets would be affected by a major disaster.

Given current available data, no quantitative assessment of the risk of winter storm was possible at the time of this NHMP update. However, assessing the risk to the County from

²⁷ NOAA, Storm Events Database, <https://www.ncdc.noaa.gov/stormevents/>

winter storms should remain an ongoing process determined by community characteristics and physical vulnerabilities. Weather forecasting can give County resources (emergency vehicles, warming shelters) time to prepare for an impending storm, but the changing character of the County population and resources will determine the impact of winter storms on life and property in Yamhill County.

The most likely impact of snow and ice events on Yamhill County are road closures limiting access/egress to/from some areas, especially roads to higher elevations. Winter storms with heavy wet snow or high winds and ice storms may also result in power outages from downed transmission lines and/or poles.

Winter storms which bring snow, ice and high winds can cause significant impacts on life and property. Many severe winter storm deaths occur as a result of traffic accidents on icy roads, heart attacks may occur from exertion while shoveling snow and hypothermia from prolonged exposure to the cold. The temporary loss of home heating can be particularly hard on the elderly, young children and other vulnerable individuals.

Property is at risk due to flooding and landslides that may result if there is a heavy snowmelt. Additionally, ice, wind and snow can affect the stability of trees, power and telephone lines and TV and radio antennas. Downed trees and limbs can become major hazards for houses, cars, utilities and other property. Such damage in turn can become major obstacles to providing critical emergency response, police, fire and other disaster recovery services.

Severe winter weather also can cause the temporary closure of key roads and highways, air and train operations, businesses, schools, government offices and other important community services. Below freezing temperatures can also lead to breaks in un-insulated water lines serving schools, businesses, industries and individual homes. All these effects, if lasting more than several days, can create significant economic impacts for the affected communities and the surrounding region. In the rural areas of the county severe winter storms can isolate small communities, farms, and ranches.

At the time of this update, enough data was not available to determine winter storm vulnerability in terms of explicit types and numbers of existing and future buildings, infrastructure or critical infrastructure.

More information on this hazard can be found in the [Risk Assessment for Region 3, Mid/Southern Willamette Valley, of the Oregon NHMP \(2015\)](#).

Volcanic Event

Significant Changes since Previous NHMP:

Updated report formatting.

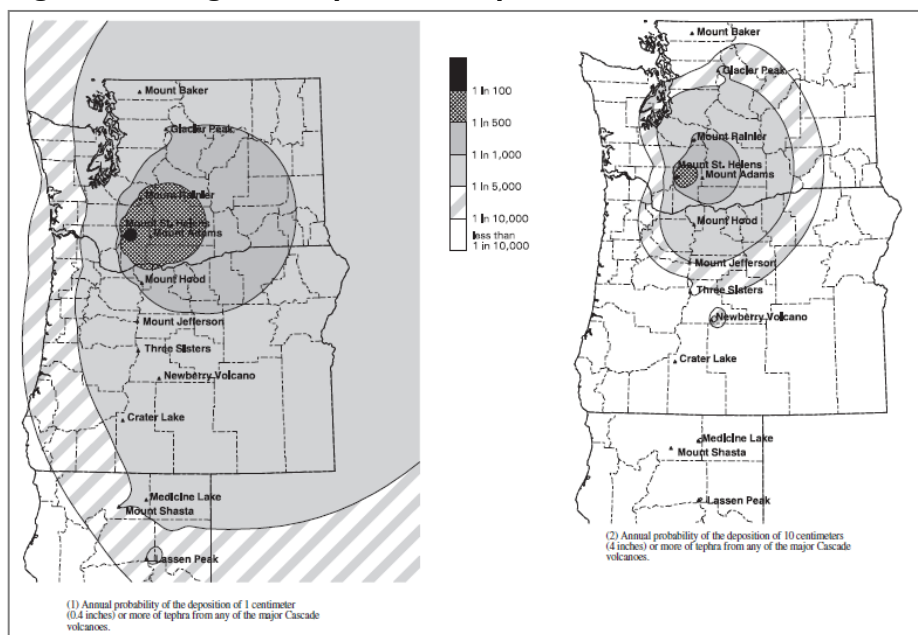
Characteristics

The Pacific Northwest lies within the “ring of fire,” an area of very active volcanic activity surrounding the Pacific Basin. Volcanic eruptions occur regularly along the ring of fire, in part because of the movement of the Earth’s tectonic plates. The Earth’s outermost shell, the lithosphere, is broken into a series of slabs known as tectonic plates. These plates are rigid, but they float on a hotter, softer layer in the Earth’s mantle. As the plates move about on the layer beneath them, they spread apart, collide, or slide past each other. Volcanoes occur most frequently at the boundaries of these plates and volcanic eruptions occur when molten material, or magma, rises to the surface.

Location and Extent

Three closest three volcanoes to Yamhill County, Mount St. Helens, Mount Hood, and Mount Jefferson, all lie to the east. Figure 2-13 depicts the potential and geographical extent of volcanic ash fall in excess of ten centimeters from a large eruption of Mt. St. Helens.

Figure 2-13 Regional Tephra-fall Maps



Source: USGS “Volcano Hazards in the Mount Jefferson Region, Oregon”

Scientists use wind direction to predict areas that might be affected by volcanic ash; during an eruption that emits ash, the ash fall deposition is controlled by the prevailing wind direction. The predominant wind pattern over the Cascades originates from the west and previous eruptions seen in the geologic record have resulted in most ash fall drifting to the

east of the volcanoes. Volcanic activity from ash clouds that drift downwind to the county from near or distant eruptions is possible from Mount Saint Helens, Mount Hood, the Three Sisters, Mount Bachelor, and the Newberry Crater areas. Because the distance to these potentially active volcanic areas is so great, the only adverse effect that would impact areas of Yamhill County is ash fallout, with potential impact on water supplies. The area affected by ash fallout depends upon the height attained by the eruption column and the atmospheric conditions at the time of the eruption. Volcanic ash can contaminate water supplies, cause electrical storms, create health problems and collapse roofs. Regional tephra fall shows the annual probability of ten centimeters or more of ash accumulation from Pacific Northwest volcanoes.

Geologic hazard maps have been created for most of the volcanoes in the Cascade Range (including Mt. St Helens, Mt. Adams, Mt. Hood, and Mt. Jefferson) by the USGS Volcano Program at the Cascade Volcano Observatory in Vancouver, WA and are available at http://vulcan.wr.usgs.gov/Publications/hazards_reports.html. Volcanic activity from more distant volcanoes will have less impact upon the County.

Additional reports are available via DOGAMI's Publications Search website:

<http://www.oregongeology.org/pubs/search.php>

Other agency/ consultant reports:

- Ewert, J.W., Diefenbach, A.K., and Ramsey, D.W., 2018, 2018 update to the U.S. Geological Survey national volcanic threat assessment: U.S. Geological Survey Scientific Investigations Report 2018–5140, 40 p., <https://doi.org/10.3133/sir20185140>.

History

Mount St. Helens has been the most active volcano in the Cascade Range during the past 10,000 years. Mount St. Helens is in southern Washington State and has been active throughout its 50,000-year lifetime. Mount Hood is just over 100 miles northeast of the county and is more than 500,000 years old. It has had two significant eruptive periods in the past 1,500 years.

In the past 200 years, seven of the Cascade volcanoes have erupted, including (from north to south): Mt. Baker, Glacier Peak, Mt. Rainier, Mount St. Helens (Washington), Mt. Hood (Oregon), Mt. Shasta and Mt. Lassen (California).

There has been no recent volcanic activity near the county associated with Mount Hood. The 1980 explosion of Mount St. Helens in southern Washington State is the latest on record; both Mount St. Helens and Mount Hood remain listed as active volcanoes.

Probability Assessment

Based on the available data and research the Steering Committee determined the **probability of experiencing volcanic activity is “low”**, meaning one incident is likely within the next 75 to 100-year period.

The United States Geological Survey-Cascades Volcano Observatory (CVO) produced volcanic hazard zonation reports for Mount St. Helens and Mount Hood in 1995 and 1997.

The reports include a description of potential hazards that may occur to immediate communities. The CVO created an updated annual probability of tephra (ash) fall map for the Cascade region in 2001, which could be a rough guide for Yamhill County in forecasting potential tephra hazard problems (Figure 2-13). The map identifies the location and extent of the hazard.

The CVO Volcanic tephra fall map is based on the combined likelihood of tephra-producing eruptions occurring at Cascade volcanoes. Probability zones extend farther east of the range because winds blow from westerly directions most of the time. The map shows annual probabilities for a fall of one centimeter (about 0.4 inch). The patterns on the map show the dominating influence of Mount St. Helens as a tephra producer. Because small eruptions are more numerous than large eruptions, the probability of a thick tephra fall at a given locality is lower than that of a thin tephra fall. The USGS estimates there is annual probability of 0.01 percent that 10 centimeters or more of tephra (ash) accumulation will occur in the far west portions of Yamhill County. Most of the county has less than 0.01 percent probability of ash fall impact.²⁸

Vulnerability Assessment

The Steering Committee rated the county as having a **“low” vulnerability to volcanic activity**, meaning that between less than one percent of the unincorporated County’s population or assets would be affected by a major disaster (volcanic ash/lahar).

The U.S. Geological Survey (USGS) lists the threat potential of volcanoes. According to the USGS there are nine volcanoes with Very High or High threat potentials in Oregon and Washington (listed here in order of threat potential): Mount St. Helens, Mount Rainier, Mount Hood, Three Sisters, Newberry, Mount Baker, Glacier Peak, Crater Lake, and Mount Adams (High).²⁹

The primary threat to lives and property from active volcanoes is from violent eruptions that unleash tremendous blast forces, generate mud and debris flows (lahars), or produce flying debris and ash clouds. Volcano hazards are divided into proximal (near the volcano) and distal (far from the volcano). Ashfall, and tephra, distal eruptive hazards, are of the greatest concern in Yamhill County. There are no proximal eruptive hazards in Yamhill County.

²⁸ USGS, 1999, *Volcano Hazards in the Mount Jefferson Region, Oregon*, Open-File Report 99-24

²⁹ Ewert, J.W., Diefenbach, A.K., and Ramsey, D.W., 2018, 2018 update to the U.S. Geological Survey national volcanic threat assessment: U.S. Geological Survey Scientific Investigations Report 2018–5140, 40 p., <https://doi.org/10.3133/sir20185140>.

Wildfire

Significant Changes since Previous NHMP:

Data from the Wildfire Risk Explorer was incorporated with this update.

The [Yamhill County Community Wildfire Protection Plan \(CWPP\)](#) was completed in August 2009 and revised in November, 2015. The CWPP is hereby incorporated into this NHMP by reference and it will serve as the wildfire chapter. The following presents a brief summary of key information; refer to the full CWPP for a complete description and evaluation of the wildfire hazard.

Characteristics

Wildfires occur in areas with large amounts of flammable vegetation that require a suppression response due to uncontrolled burning. Fire is an essential part of Oregon's ecosystem, but can also pose a serious threat to life and property particularly in the state's growing rural communities. Wildfire can be divided into three categories: interface, wildland and firestorms. The increase in residential development in interface areas has resulted in greater wildfire risk. Fire has historically been a natural wildland element and can sweep through vegetation that is adjacent to a combustible home. New residents in remote locations are often surprised to learn that in moving away from built-up urban areas, they have also left behind readily available fire services providing structural protection. Recent fires in Oregon and across the western United States have increased public awareness over the potential losses to life, property and natural and cultural resources that fire can pose.

The following three factors contribute significantly to wildfire behavior and can be used to identify wildfire hazard areas.

Topography: As slope increases, the rate of wildfire spread increases. South-facing slopes are also subject to more solar radiation, making them drier and thereby intensifying wildfire behavior. However, ridgetops may mark the end of wildfire spread, since fire spreads more slowly or may even be unable to spread downhill.

Fuel: The type and condition of vegetation plays a significant role in the occurrence and spread of wildfires. Certain types of plants are more susceptible to burning or will burn with greater intensity. Dense or overgrown vegetation increases the amount of combustible material available to fuel the fire (referred to as the "fuel load"). The ratio of living to dead plant matter is also important. The risk of fire is increased significantly during periods of prolonged drought as the moisture content of both living and dead plant matter decreases. The fuel's continuity, both horizontally and vertically, is also an important factor.

Weather: The most variable factor affecting wildfire behavior is weather. Temperature, humidity, wind and lightning can affect chances for ignition and spread of fire. Extreme weather, such as high temperatures and low humidity, can lead to extreme wildfire activity. By contrast, cooling and higher humidity often signals reduced Wildfire occurrence and easier containment.

The frequency and severity of wildfires is also dependent upon other hazards, such as lightning, drought, equipment use, railroads, recreation use, arson and infestations. If not promptly controlled, wildfires may grow into an emergency or disaster. Even small fires can threaten lives and resources and destroy improved properties. In addition to affecting people, wildfires may severely affect livestock and pets. Such events may require emergency watering/feeding, evacuation and shelter.

The indirect effects of wildfires can be catastrophic. In addition to stripping the land of vegetation and destroying forest resources, large, intense fires can harm the soil, waterways and the land itself. Soil exposed to intense heat may lose its capability to absorb moisture and support life. Exposed soils erode quickly and enhance siltation of rivers and streams, thereby enhancing flood potential, harming aquatic life and degrading water quality. Lands stripped of vegetation are also subject to increased debris flow hazards, as described above.

Location and Extent

Wildfire hazard areas are commonly identified in regions as the Wildland Urban Interface (WUI). The interface is the urban-rural fringe where homes and other structures are built into a densely forested or natural landscape. If left unchecked, it is likely that fires in these areas will threaten lives and property. One challenge Yamhill County faces is from the increasing number of houses being built in the urban/rural fringe and areas with heavy fuel loads. The “interface” between urban or suburban areas and the resource lands has significantly increased the threat to life and property from fires. Responding to fires in the expanding Wildland Urban Interface area may tax existing fire protection systems beyond original design or current capability.

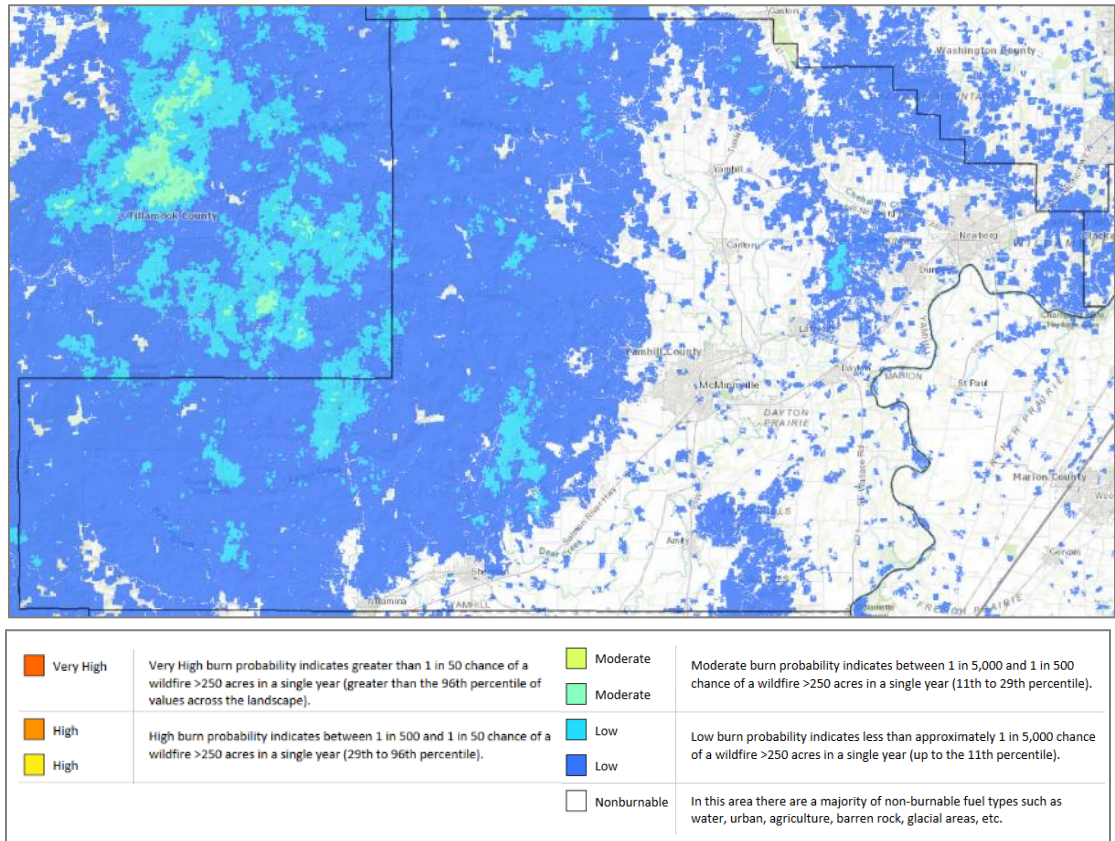
The ease of fire ignition further determines ranges of the wildfire hazard due to natural or human conditions and the difficulty of fire suppression. The wildfire hazard is also magnified by several factors related to fire suppression/control, such as the surrounding fuel load, weather, topography and property characteristics.

Fire susceptibility throughout the county dramatically increases in late summer and early autumn as summer thunderstorms with lightning strikes increases and vegetation dries out, decreasing plant moisture content and increasing the ratio of dead fuel to living fuel. However, various other factors, including humidity, wind speed and direction, fuel load and fuel type and topography can contribute to the intensity and spread of wildland. In addition, common causes of wildfires include arson and negligence from industrial and recreational activities.

In Yamhill County, Wildland/Urban Conflagrations burn primarily vegetative fuels, outside highly urbanized areas. The Willamette Valley was originally covered by lowland evergreen and deciduous forests and native prairie grasslands. Now there is more brush, small diameter trees, Douglas fir, and more crops, such as wheat, which can increase potential for wildfire damage. The extent of the hazard is greatest along the county’s mountainous eastern boundary (see Figure 2-14). In these areas, there is low burn probability with expected flame lengths generally less than 4 to 8-feet under normal weather conditions. Most of the developed portion of the county has less severe (unburnable to low) wildfire burn probability that include expected flame lengths less than 8-feet under normal weather conditions. Conditions vary widely and with local topography, fuels, and local weather (including wind) conditions. Under warm, dry, windy, and drought conditions expect higher

likelihood of fire starts, higher intensity, more ember activity, and a more difficult to control wildfire that will include more fire effects and impacts.

Figure 2-14 Extent of Wildfire Hazard (Burn Probability)



Source: [Oregon Wildfire Risk Explorer: County Summary Report](#) (December 2018) – To view map in more detail click hyperlink to left. Retrieved September 11, 2019.

Other agency/ consultant reports:

- Scott L. Stephens, Ralph E.J. Boerner, Jason J. Maghaddas, Emily E.Y. Maghaddas, Brandon M. Collins, Christopher B. Dow, Carl Edminster, Carl E. Fiedler, Danny L. Fry, Bruce R. Hartsough, Jon E. Keeley, Eric E. Knapp, James D. McIver, Carl N. Skinner, and Andrew P. Youngblood, Fuel treatment impacts on estimated wildfire carbon loss from forests in Montana, Oregon, California, and Arizona; 07 May 2012, available at <https://pubs.er.usgs.gov/publication/70157098>

History

From 2008 to 2017, Yamhill County saw 390 acres burned from a total of 137 fires.³⁰ Figure 2-15 shows fire starts from 2008 to 2017, fires ignited by humans are shown in red, lightning caused fires are shown in yellow. In the past 10 years 7% of all fires were caused by lightning and 93% of fires were caused by human activity (ranging from arson and debris burning to equipment use and fires caused along powerlines). In general, the human caused wildfires

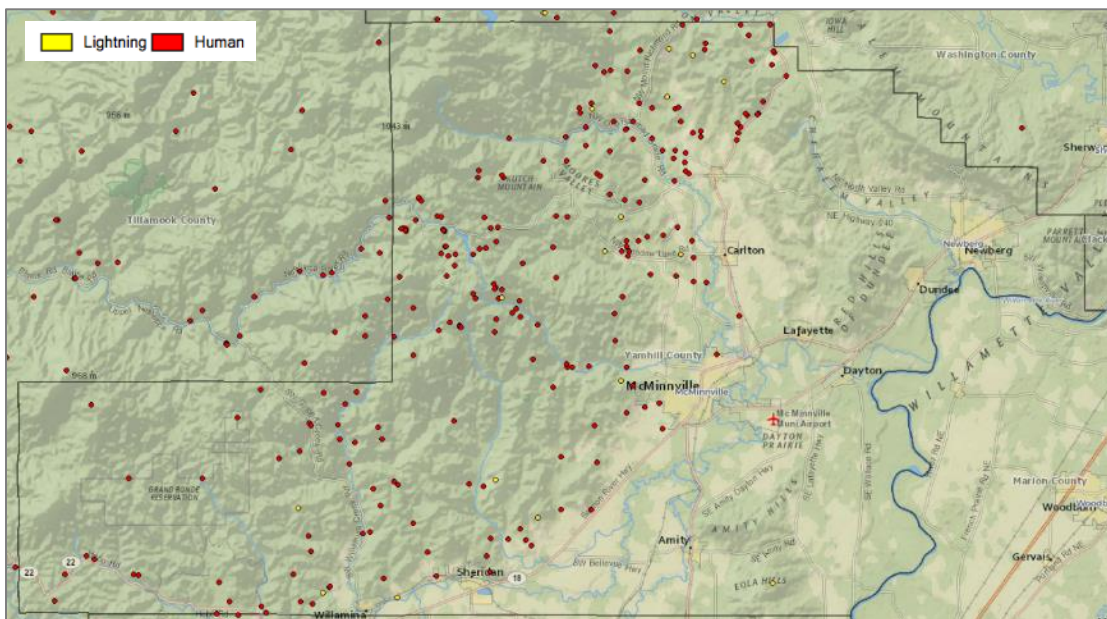
³⁰ Oregon Wildfire Risk Explorer, Area of Interest Report, Yamhill County, accessed September 11, 2019. http://oe.oregonexplorer.info/ExternalContent/wildfire_reports/WildfireRisk_summary_report_yamhill_county.pdf

are in populated areas and within river and stream corridors near transportation routes, while lightning caused wildfires are often in more remote locations. Wildland/Urban Conflagrations are not common in the Willamette Valley and based on historic events, large fires (1,000-acres) are only likely to occur every 20 years.

Urban fires are the most preventable type of fire, and future events depend largely on prevention measures. Although no historical urban conflagrations in have occurred, educating residents, building and maintenance code enforcement, and firefighting equipment, staff, and response systems upkeep are all steps that can ensure that highly likely localized urban fires do not become large-scale conflagrations.

While most fire ignitions occurred along travel corridors and the edges of major urban areas, the fires that escape initial suppression efforts tend to be in more remote areas and are more likely to occur in some portions of the landscape than others.

Figure 2-15 Local Fire Starts (1992-2017)



Source: [Oregon Wildfire Risk Explorer: County Summary Report](#) (December 2018)– To view map in more detail click hyperlink to left. Retrieved September 11, 2019.

Probability Assessment

Based on the available data and research the Steering Committee determined the **probability of experiencing a Wildfire is “low”**, meaning one incident is likely within the next 75 to 100-year period. See Figure 2-14 for more information on location of probable wildfires.

Certain conditions must be present for significant interface fires to occur. The most common are hot, dry and windy weather; the inability of fire protection forces to contain or suppress the fire; the occurrence of multiple fires that overwhelm committed resources; and a large fuel load (dense vegetation). Once a fire has started, several conditions influence its behavior, including fuel, topography, weather, drought and development. Many of these conditions are demonstrated across large areas within Yamhill County, creating a significant collective risk.

Vulnerability Assessment

The Steering Committee rated the county as having a **“low” vulnerability to wildfire hazards**, meaning that less than one percent of the County’s population or assets would be affected by a major disaster.

The Yamhill County CWPP addresses wildfires countywide and defined as either Zone 1 or Zone 2. Zone 1 is the western one-third of the county (225,000 acres) that is forested, mountainous, and sparsely populated.

Zone 1 is outside of any County Fire Protection District and is considered commercial forest (private and industrial forest lands including BLM and National Forest) within the Oregon Department of Forestry Protection District. Table 2-11 shows the overall fire risk rating for Zone 1 is considered high.

Zone 2 includes all portions of the County that are east of Zone 1 and includes incorporated cities, agricultural land, unincorporated communities, and scattered homes. Most of this land is flat and privately owned. Table 2-11 shows the overall fire risk rating for Zone 2 is considered high.

Table 2-11 CWPP Wildfire Risk Assessment: Overall Fire Risk

Risk Factors	Zone 1	Zone 2
Ignition Risk	15 points (Moderate)	27 points (Moderate)
Hazard	59 points (High)	52 points (High)
Values Protected	35 points (Moderate)	35 points (Moderate)
Protection Capability/ Community Preparedness	36 points (High)	10 points (Moderate)
Overall Rating	145 points (High)	124 points (High)

Source: [Yamhill County Community Wildfire Protection Plan](#) (2009)

The CWPP utilized the local level wildfire risk assessment methodology developed by the Oregon Department of Forestry. The risk assessment provides ratings of low, moderate, or high based on four risk factors: Ignition Risk, Hazard, Values Protected, and Protection Capability/Community Preparedness. Zone 1 and Zone 2 were assessed separately based on the four factors, each factor has from two to five criteria to better describe them, each criterion was given a score based on its level of importance, ratings were assigned based on the cumulative criteria scores, and the cumulative scores of the four factors determined the Overall Risk Rating.

The NHMP steering committee reviewed the CWPP risk assessment along with the County Summary Report from the Oregon Wildfire Risk Explorer to determine their countywide vulnerability to wildfire (see description below and Figure 2-16 and Figure 2-17). The wildfire risk assessment will be revised and updated when the Yamhill County CWPP is updated.

Table 2-12 shows the detail of the CWPP Wildfire Risk Assessment Overall Fire Risk for Zones 1 and 2. For an explanation of the categories see the [Yamhill County CWPP \(2015\)](#).

Table 2-12 CWPP Wildfire Risk Assessment: Ratings Summary

FACTOR	CRITERIA	POSSIBLE SCORE	ZONE 1 SCORE	ZONE 2 SCORE
Ignition Risk	Wildfire History	5-20	10	15
	Home Density	0-10	0	2
	Other Wildfire Risks	0-10	5	10
Ignition Risk Rating			Moderate	Moderate
Hazard	Weather	20	20	20
	Slope	0-3	2	0
	Aspect	0-5	5	5
	Elevation	0-2	2	2
	Vegetation	0-20	20	20
	Crown Fire	0-10	10	5
Hazard Rating			High	High
Values	Natural Resources	0-15	15	8
	Home Density	0-30	0	7
	Infrastructure	0-20	20	20
Values Rating			Moderate	Moderate
Protection Capability	Response Capability	0-36	36	8
	Community Preparedness	0-4	0	2
Protection Capability Rating			High	Moderate
TOTAL		0-195	145	124
Overall Risk Rating			High	High

Source: [Yamhill County Community Wildfire Protection Plan](#) (2015)

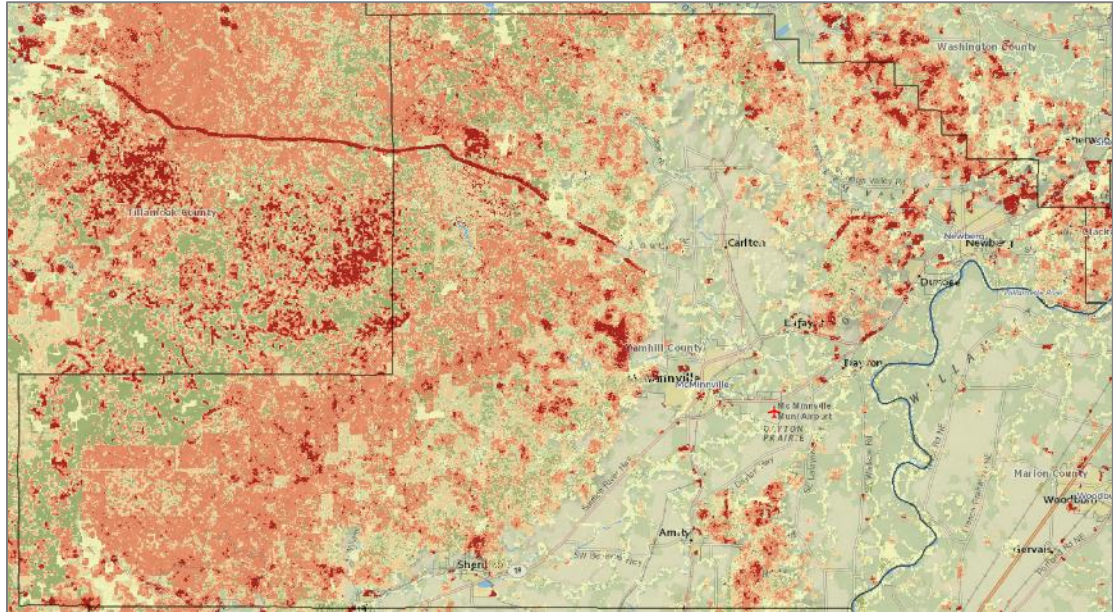
The Oregon Wildfire Risk Explorer provides detail on the potential impact to structure from wildfire as shown in Figure 2-16, darker areas have higher potential impacts if fire ignites nearby. The areas of greater risk are generally located in more rural parts of the county, that are hillier, and more heavily vegetated and forested.

Generally, the populated areas of the county (Zone 2 in the CWPP) have low to moderate consequences to wildfire to all mapped highly valued resources and assets (e.g., critical infrastructure, developed recreation, housing unit density, seed orchards, sawmills, historic structures, timber, municipal watershed, vegetation condition, and terrestrial and aquatic wildlife). The unpopulated areas of the county (Zone 1 in the CWPP) generally have moderate consequences with some areas of high to very high consequences. The areas of high to very high consequences are generally in forested areas.

Figure 2-17 shows that the overall wildfire risk for Yamhill County is considered low for the majority of Yamhill County with some pockets of medium overall fire risk in the forested hills in the western portion of the county (Zone 1 in the CWPP) per the Oregon Wildfire Risk Explorer. Overall wildfire risk is calculated based on the likelihood and consequence of wildfire on all mapped highly valued resources and assets combined (see list in previous section). The data considers the likelihood of wildfires burning greater than 250 acres, the

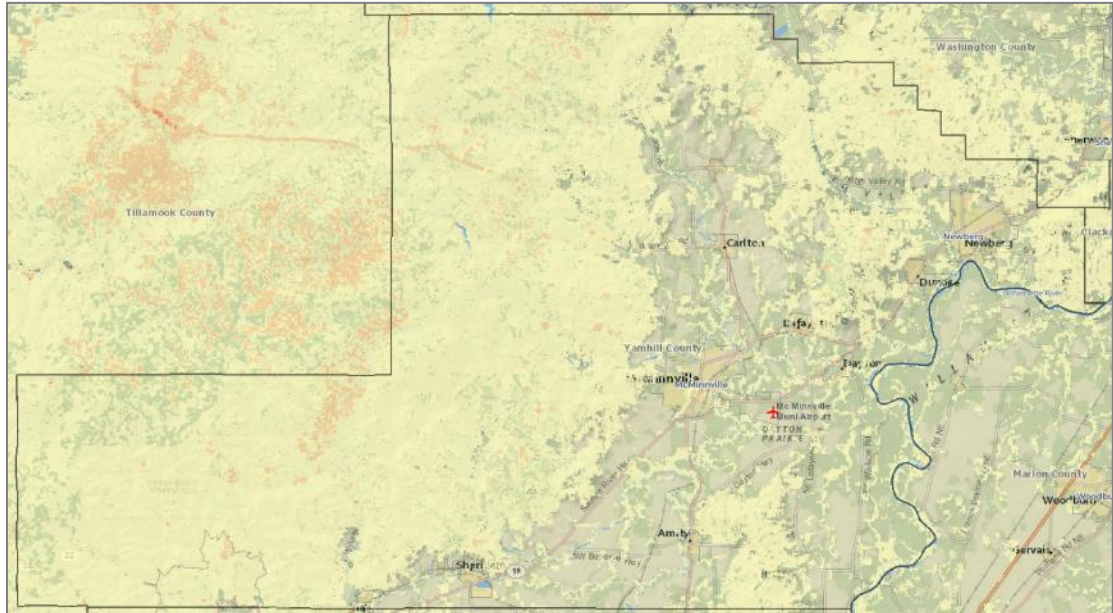
susceptibility of resources and assets to wildfire of different intensities, and the likelihood of those intensities.

Figure 2-16 Oregon Wildfire Risk Explorer – Overall Potential Impact



Source: [Oregon Wildfire Risk Explorer: County Summary Report](#)– To view map in more detail click hyperlink to left. Accessed September 11, 2019.

Figure 2-17 Oregon Wildfire Risk Explorer – Overall Wildfire Risk



Source: [Oregon Wildfire Risk Explorer: County Summary Report](#)– To view map in more detail click hyperlink to left. Accessed September 11, 2019.

Additional wildfire hazard information for Yamhill County and cities is available via the [Yamhill County CWPP \(2015\)](#) and Oregon Explorer’s [Wildfire Risk Explorer](#).

SECTION 3: MITIGATION STRATEGY

This section outlines Yamhill County's strategy to reduce or avoid long-term vulnerabilities to the identified hazards. Specifically, this section presents a mission and specific goals and actions thereby addressing the mitigation strategy requirements contained in 44 CFR 201.6(c). The NHMP Steering Committee viewed and updated the mission, goals, and action items documented in this NHMP. Additional planning process documentation is in Volume III, Appendix B.

Mitigation Plan Mission

The NHMP mission states the purpose and defines the primary functions of Yamhill County's 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 Yamhill County NHMP is to:

To promote public policy and mitigation activities which will enhance the safety to life and property from natural hazards.

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

Note: The 2019 NHMP Steering Committee developed the above mission statement to fit the needs of Yamhill County for this update.

Mitigation Plan Goals

Mitigation plan goals are more specific statements of direction that Yamhill 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 action items. The goals listed here serve as checkpoints as agencies and organizations begin implementing mitigation action items.

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

The 2019 Yamhill County NHMP Steering Committee reviewed the previous NHMP goals in comparison to the State NHMP (2015) goals and determined that they would retain their original goals without modifications.

All the NHMP goals are important and are listed below in no 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: EMERGENCY OPERATIONS

- Coordinate natural hazard mitigation activities, where appropriate, with emergency operations plans and procedures and with other agencies.

GOAL 2: EDUCATION AND OUTREACH

- Develop and implement education and outreach programs to increase public awareness of the risks associated with natural hazards.

GOAL 3: PARTNERSHIPS

- Develop effective partnerships with public and private sector organizations and significant agencies and businesses for future natural hazard mitigation efforts.
- Coordinate natural hazard mitigation actions between the County and local jurisdictions to create more cohesive and effective hazard mitigation efforts.

GOAL 4: PREVENTIVE

- Develop and implement activities to protect human life, commerce, and property from natural hazards.
- Reduce losses and repetitive damage for chronic hazard events while promoting insurance coverage for catastrophic hazards.

GOAL 5: NATURAL RESOURCES UTILIZATION

- Link natural resources management, land use planning, and watershed planning with natural hazard mitigation activities to protect natural systems and allow them to serve natural hazard mitigation functions.

GOAL 6: IMPLEMENTATION

- Implement strategies to mitigate the effects of natural hazards and increase the quality of life and resilience of economies in Yamhill County.

GOAL 7: DEVELOPMENT

- Communities appropriately apply development standards that consider the potential impacts of natural hazards.

GOAL 8: DOCUMENTATION

- Document and evaluate progress in achieving hazard mitigation strategies and action items.

Action Item Development Process

Action items identified through the planning process are an important part of the mitigation plan. Action items are detailed recommendations for activities that local departments, citizens, and others could engage in to reduce risk. Development of action items was a multi-step, iterative process that involved brainstorming, discussion, review and revisions. Action items can be developed through many sources. Figure 3-1 illustrates some of these sources.

Figure 3-I Development of Action Items



Most of the action items were first created during the previous NHMP planning processes. During these processes, the Steering Committee developed maps of local vulnerable populations, facilities and infrastructure in respect to each identified hazard. Review of these maps generated discussion around potential actions to mitigate impacts to the vulnerable areas. The Oregon Partnership for Disaster Resilience (OPDR) provided guidance in the development of action items by presenting and discussing actions that were used in other communities. OPDR also took note of ideas that came up in Steering Committee meetings and drafted specific actions that met the intent of the Steering Committee. All actions were then reviewed by the Steering Committee, discussed at length and revised as necessary before becoming a part of this document.

Action Item Matrix

The action item matrix (Table 3-1) portrays the overall action plan framework and identifies linkages between the NHMP goals, partnerships (coordination and partner organizations), and actions. The matrix documents a brief description of the action, coordinating and partner (internal) organizations, timeline (ongoing, short term, long term), priority (low, medium, high), and NHMP goals addressed. Refer to Volume III, Appendix A for detailed information for each action.

Action Item Framework

Many of the Yamhill County NHMP’s recommendations are consistent with the goals and objectives of the County’s existing plans and policies. Where possible, Yamhill County will implement the NHMP’s recommended actions through existing plans and policies. Plans and policies already in existence have support from residents, businesses, and policy makers. Many land-use, comprehensive, and strategic plans get updated regularly, and can adapt

easily to changing conditions and needs. Implementing the NHMP's action items through such plans and policies increases their likelihood of being supported and implemented.

See Volume II for the actions for each participating city or special district.

Action Item Prioritization

The Steering Committee decided to modify the prioritization of action items in this update to reflect current conditions and needs. Upon review, the Steering Committees assigned a high priority ranking to actions that best fulfill the goals of the NHMP and are appropriate and feasible for each jurisdiction and responsible entities to implement during the five-year lifespan of this version of the NHMP. High priority actions are shown in **bold** text with grey highlight within Table 3-1 (see page 3-2 for full text of the referenced plan goals).

During the 2019 update, the Steering Committee agreed to revise some existing actions to make them more specific, to remove actions that no longer apply or are considered complete, and to add new actions to respond to new vulnerabilities (see Volume III, Appendix A for an updated list of action items and Appendix B for information on changes).

The Steering Committee will prioritize the following actions to focus their attention, and resource availability, upon an achievable set of high leverage activities over the next five-years.

- **Multi-Hazard #1:** Develop, produce, and distribute public education and information materials concerning mitigation, preparedness and safety procedures for all natural hazards.
- **Multi-Hazard #5:** Develop public and private partnerships to foster natural hazard mitigation program coordination and collaboration in Yamhill County such as MOUs and CPODS etc.
- **Multi-Hazard #6:** Develop a long-term recovery plan for Yamhill County from the effects of natural hazards.
- **Multi-Hazard #8:** Train elected officials and recorders in small towns who have no emergency management background on hazard mitigation needs.
- **Earthquake #1:** Conduct seismic strength evaluations of critical facilities and infrastructure to identify vulnerabilities and seismically retrofit (structural and nonstructural) identified critical facilities and infrastructure to meet life safety standards in order to continue operations post-earthquake.
- **Landslide #1:** Use DOGAMI landslide risk maps to improve public knowledge of landslide hazard areas and understanding of vulnerability and risk to life and property in hazard-prone areas in Yamhill County.
- **Wildfire #1:** Coordinate wildfire mitigation action items through the Yamhill County Community Wildfire Protection Plan.
- **Wildfire #4:** Improve fire identification data collection and reporting to enhance emergency response and evacuation procedures.

Although this methodology provides a guide for the Steering Committee in terms of implementation, the Steering Committee 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 the highest priority.

Table 3-1 Yamhill County Action Items

Natural Hazard Action ID	Action Item	Coordinating Organization (Lead)	Internal Partners	Potential Funding	Cost	Timing	Plan Goals Addressed							
							Goal 1	Goal 2	Goal 3	Goal 4	Goal 5	Goal 6	Goal 7	Goal 8
Multi-Hazard Actions														
Multi-Hazard #1	Develop, produce, and distribute public education and information materials concerning mitigation, preparedness and safety procedures for identified natural hazards.	Emergency Management	Public Health, Fire, Sheriff's Office	General fund, grants	L	Ongoing	✓	✓	✓			✓	✓	
Multi-Hazard #2	Incorporate Yamhill County Natural Hazard Mitigation Plan actions and goals in regulatory documents, e.g., Comprehensive Plan and the zoning code, and in existing plans, policies, or programs in the county that address natural hazards.	Planning	Emergency Management	General fund, grants, DLC D TA	M	Medium	✓			✓	✓	✓	✓	
Multi-Hazard #3	Use DOGAMI Corridor study to identify the effects of each natural hazard on priority transportation routes to and from critical facilities, such as, emergency facilities and first responder sites.	Public Works	ODOT	General fund, grants, ODOT, DOGAMI	L	Ongoing	✓			✓			✓	
Multi-Hazard #4	Participate in collaborative programs to decrease the risk of natural hazards such as FEMA FLIP and FIRM.	Emergency Management	Public Health	General fund	L	Ongoing	✓		✓	✓		✓	✓	
Multi-Hazard #5	Develop public and private partnerships to foster natural hazard mitigation program coordination and collaboration in Yamhill County such as MOUs and CPODS etc.	Emergency Management	Public Health	General fund, grants	L	Ongoing	✓	✓	✓			✓	✓	

Natural Hazard Action ID	Action Item	Coordinating Organization (Lead)	Internal Partners	Potential Funding	Cost	Timing	Plan Goals Addressed							
							Goal 1	Goal 2	Goal 3	Goal 4	Goal 5	Goal 6	Goal 7	Goal 8
Multi-Hazard #6	Develop a long-term recovery plan for Yamhill County from the effects of natural hazards.	Emergency Management	County Administration	General fund, grants	M	Short	✓		✓	✓		✓	✓	✓
Multi-Hazard #7	Update jurisdictional debris management plan to include provisions for winter storm and windstorm. Update should include labor & equipment tracking protocols for disaster assessment data collection.	Emergency Management	Public Works	General fund	L	Ongoing	✓		✓	✓		✓	✓	✓
Multi-Hazard #8	Train elected officials and recorders in small towns who have no emergency management background on hazard mitigation needs.	Emergency Management	Administration, OEM	General fund, EMPG	L	Short	✓	✓	✓					✓
Multi-Hazard #9	Determine critical bridge infrastructure – lifeline routes – water, sewer, power.	Public Works	ODOT	General fund, grants	M	Ongoing	✓		✓					✓
Multi-Hazard #10	Promote and educate public on energy independence projects in neighborhoods and communities.	BOC	County Administration	General fund	L	Ongoing	✓	✓		✓		✓	✓	✓
Drought Actions														
Drought #1	Encourage coordination among municipalities for water issues, such as inter-tied water systems and local water storage to mitigate drought	Emergency Management	Public Health, COG, LOC	General fund, grants	L	Ongoing	✓		✓	✓	✓		✓	✓

Natural Hazard Action ID	Action Item	Coordinating Organization (Lead)	Internal Partners	Potential Funding	Cost	Timing	Plan Goals Addressed							
							Goal 1	Goal 2	Goal 3	Goal 4	Goal 5	Goal 6	Goal 7	Goal 8
Earthquake Actions														
Earthquake #1	Conduct seismic strength evaluations of critical facilities and infrastructure to identify vulnerabilities and seismically retrofit (structural and nonstructural) identified critical facilities and infrastructure to meet life safety standards in order to continue operations post-earthquake.	Facilities	Emergency Management	General fund, grants, SRGP	M-H	Medium	✓			✓		✓		✓
Flood Actions														
Flood #1	Implement, and maintain the requirements needed for Yamhill County to participate in the NFIP's Community Rating System and seek to improve the County's rating.	Planning	Emergency Management	General fund	L	Ongoing	✓			✓	✓	✓	✓	✓
Flood #2	Coordinate with DOGAMI and DLCD to enhance data and mapping of floodplain data in the county. Identify and map flood-prone areas outside of designated floodplains.	Emergency Management	Planning	General fund, Risk MAP, HMA	H	Medium	✓		✓			✓		✓
Flood #3	Retrofit culverts in Yamhill County with pipes designed for 50 to 100-year flood intervals.	Public Works	Planning, ODOT	General fund, ODOT	H	Ongoing	✓			✓		✓		✓
Flood #4	Ensure continued compliance in the NFIP through enforcement of local flood plain management ordinances. Mitigate repetitive flood loss properties as applicable.	Planning	Public Works, Emergency Management	General fund	L	Ongoing	✓			✓		✓	✓	✓

Natural Hazard Action ID	Action Item	Coordinating Organization (Lead)	Internal Partners	Potential Funding	Cost	Timing	Plan Goals Addressed							
							Goal 1	Goal 2	Goal 3	Goal 4	Goal 5	Goal 6	Goal 7	Goal 8
Landslide Actions														
Landslide #1	Utilize the updated regional landslide risk maps (DOGAMI O-16-02) to identify hazard areas and collaborate with the Oregon Department of Geology and Mineral Industries to work on landslide risk reduction efforts; determine areas and buildings at risk to landslides and propose Comprehensive Plan and land use policies accordingly.	Emergency Management	Planning, Public Works, DOGAMI	Risk MAP, HMA grants, General fund	M	Short	✓	✓	✓			✓	✓	
Landslide #2	Encourage construction, site location and design that can be applied to steep slopes to reduce the potential threat of landslides.	Planning	Public Works	General fund	L	Ongoing	✓			✓		✓	✓	
Severe Weather Actions (Windstorm and Winter Storm – Snow/Ice)														
Winter Storm #1	Develop and implement programs to coordinate maintenance and mitigation activities to reduce risk to public infrastructure from severe weather (windstorms and winter storms).	Public Works	Local Utilities	General fund, grants	L	Short	✓		✓	✓		✓	✓	
Wildfire Actions														
Wildfire #1	Coordinate wildfire mitigation action items through the Yamhill County Community Wildfire Protection Plan.	Fire Defense Board	Emergency Management	General fund, ODF	L-H	Ongoing	✓	✓	✓	✓	✓	✓	✓	

Natural Hazard Action ID	Action Item	Coordinating Organization (Lead)	Internal Partners	Potential Funding	Cost	Timing	Plan Goals Addressed									
							Goal 1	Goal 2	Goal 3	Goal 4	Goal 5	Goal 6	Goal 7	Goal 8		
Wildfire #2	Coordinate with ODF to regularly update and maintain the Community Wildfire Protection Plan for susceptible urban/wildland interface areas in Yamhill County.	Fire Defense Board	Emergency Management	General fund, ODF	L	Ongoing	✓		✓							✓
Wildfire #3	Conduct regular fuel-reduction projects throughout wildfire hazard-prone areas in Yamhill County.	Fire Defense Board	ODF, BOC,	General fund, ODF, grants	M	Ongoing	✓	✓		✓	✓	✓				✓
Wildfire #4	Improve fire identification data collection and reporting to enhance emergency response and evacuation procedures.	Fire Defense Board	Sheriff's Office	General fund, grants	L	Short	✓		✓							✓
Wildfire #5	Develop an inventory of alternative firefighting water sources and encourage the development of additional sources.	Fire Defense Board	ODF	General fund, grants	L	Short	✓		✓				✓			✓
Wildfire #6	Develop an inventory of firefighting hardware to be better prepared when attacking wildfires. (Resource inventory is complete)	Fire Defense Board	ODF	General fund, grants	L	Short	✓		✓							✓

Source Yamhill County NHMP Steering Committee, updated 2019
Note: Full text of the plan goals referenced in this table is located on page 3-2.

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SECTION 4:

PLAN IMPLEMENTATION AND MAINTENANCE

This section details the formal process that will ensure that the NHMP remains an active and relevant document. The NHMP implementation and maintenance process includes a schedule for monitoring and evaluating the NHMP semi-annually, as well as producing an updated NHMP every five years. Finally, this section describes how the County will integrate public participation throughout the NHMP maintenance and implementation process.

Implementing the NHMP

The success of the Yamhill County NHMP depends on how well the outlined action items are implemented. In an effort to ensure that the activities identified are implemented, the following steps will be taken: 1) the NHMP will be formally adopted, 2) a Steering Committee will be assigned, 3) a convener shall be designated, 4) semi-annual meetings will be held, 5) the identified activities will be prioritized and evaluated, and 6) the NHMP will be implemented through existing plans, programs and policies.

NHMP Adoption

The Yamhill County NHMP was developed and will be implemented through a collaborative process. After the NHMP is locally reviewed and deemed complete, the Yamhill County Resilience Coordinator, or their designee, shall submit it to the State Hazard Mitigation Officer (SHMO) at the Oregon Office of Emergency Management (OEM). OEM submits the NHMP to FEMA-Region X for review. This review addresses the federal criteria outlined in the FEMA Interim Final Rule 44 CFR Part 201. Upon acceptance by FEMA, the County will adopt the NHMP via resolution. At that point, the County will gain eligibility for the Pre-Disaster Mitigation (PDM) Grant Program, the Hazard Mitigation Grant Program (HMGP) and Flood Mitigation Assistance (FMA) grant program funds. Following adoption by the County, the participating jurisdictions should convene local decision makers and adopt the Yamhill County Multijurisdictional NHMP.

Convener

The Board of County Commissioners (BCC) will adopt the Yamhill County NHMP, and the Steering Committee will take responsibility for plan implementation. The County Administrator or designee (Yamhill County Emergency Manager) will serve as the NHMP convener to facilitate the Steering Committee meetings and will assign tasks such as updating and presenting the NHMP to the members of the committee.

- Coordinate Steering Committee meeting dates, times, locations, agendas and member notification;
- Document the discussions and outcomes of committee meetings;
- Serve as a communication conduit between the Steering Committee and the public/stakeholders;
- Identify emergency management-related funding sources for natural hazard mitigation projects; and
- Utilize the Risk Assessment as a tool for prioritizing proposed natural hazard risk reduction projects.

NHMP implementation and evaluation will be a shared responsibility among all Steering Committee members.

Hazard Mitigation Advisory Committee

The Steering Committee serves as the coordinating body for the NHMP and is responsible for coordinating implementation of NHMP action items and undertaking the formal review process. The BCC will assign representatives from county agencies, including, but not limited to, the current Steering Committee members.

Roles and responsibilities of the Steering Committee include:

- Attending future meetings;
- Prioritizing projects and recommending funding for natural hazard risk reduction projects;
- Participation in the NHMP update process;
- Documenting successes and lessons learned;
- Evaluating and updating the NHMP following a disaster;
- Evaluating and updating the NHMP in accordance with the prescribed maintenance schedule; and
- Development and coordination of ad hoc and/or standing subcommittees as needed.

Steering Committee Members

The following jurisdictions, agencies and/or organizations were represented and served on the Steering Committee during the development of the Yamhill County NHMP and may be represented during implementation and maintenance phase (for a list of individuals see *Acknowledgements*):

<u>County Departments</u>	<u>Participating Cities</u>	<u>Other</u>
Board of County Commissioners	City of Amity	Sheridan School District
Emergency Management	City of Dayton	Sheridan Fire/West Valley Fire
Planning	City of McMinnville	Tualatin Valley Fire & Rescue
Public Health	McMinnville Water & Light	
Public Works	McMinnville Fire	
	City of Newberg	
	City of Sheridan	
	City of Willamina	
	City of Yamhill	

To make the coordination and review of the Yamhill County NHMP as broad and useful as possible, the Steering Committee will engage additional stakeholders and other relevant hazard mitigation organizations and agencies to implement the identified action items. Specific organizations have been identified as partners in the action item matrices.

Implementation through existing programs

The NHMP includes a range of action items that, when implemented, will reduce loss from hazard events in the county. Within the NHMP, FEMA requires the identification of existing programs that might be used to implement these action items. Yamhill County and the participating cities currently address statewide planning goals and legislative requirements through their comprehensive land use plans, capital improvement plans, mandated standards and building codes. To the extent possible, Yamhill County and participating cities will work to incorporate the recommended mitigation action items into existing programs and procedures.

Many of the recommendations contained in the NHMP are consistent with the goals and objectives of the participating City and County's existing plans and policies. Where possible, Yamhill County and participating cities should implement the recommended actions contained in the NHMP through existing plans and policies. Plans and policies already in existence often have support from residents, businesses and policy makers. Many land-use, comprehensive and strategic plans get updated regularly and can adapt easily to changing conditions and needs. Implementing the action items contained in the NHMP through such plans and policies increases their likelihood of being supported and implemented.

Examples of plans, programs or agencies that may be used to implement mitigation activities include:

- City and County Budgets
- Community Wildfire Protection Plans
- Comprehensive Land Use Plans
- Economic Development Action Plans
- Zoning Ordinances and Building Codes

For additional examples of plans, programs or agencies that may be used to implement mitigation activities refer to list of plans in Volume I, Section 2.

NHMP Maintenance

NHMP maintenance is a critical component of the NHMP. Proper maintenance of the NHMP ensures that it will maximize the County and participating Cities' efforts to reduce the risks posed by natural hazards. This section was developed by OPDR and includes a process to ensure that a regular review and update of the NHMP occurs. The Steering Committee and local staff are responsible for implementing this process, in addition to maintaining and updating the NHMP through a series of meetings outlined in the maintenance schedule below.

Meetings

The Steering Committee will meet on a **semi-annual basis** to complete the following tasks. During the first meeting the Steering Committee will:

- Review existing action items to determine appropriateness for funding;
- Educate and train new members on the NHMP and mitigation in general;
- Identify issues that may not have been identified when the NHMP was developed;
- and

- Prioritize potential mitigation projects using the methodology described below.

During the second meeting, the Steering Committee will:

- Review existing and new risk assessment data;
- Discuss methods for continued public involvement; and
- Document successes and lessons learned during the year.

The County's Emergency Manager will host a meeting once a year with the city and special district leads for participating jurisdictions. This meeting is an opportunity for the cities and special districts to report back to the County on progress that has been made towards their NHMP Addenda. This meeting will also serve as a means for the Emergency Manager to provide information regarding potential funding sources for mitigation projects, as well as provide additional support for the city and special district steering committees.

The convener will be responsible for documenting the outcome of the semi-annual meetings. The process the coordinating body will use to prioritize mitigation projects is detailed in the section below. The NHMP's format allows the County and participating jurisdictions (cities and special districts) to review and update sections when new data becomes available. New data can be easily incorporated, resulting in a NHMP that remains current and relevant to the participating jurisdictions.

Project Prioritization Process

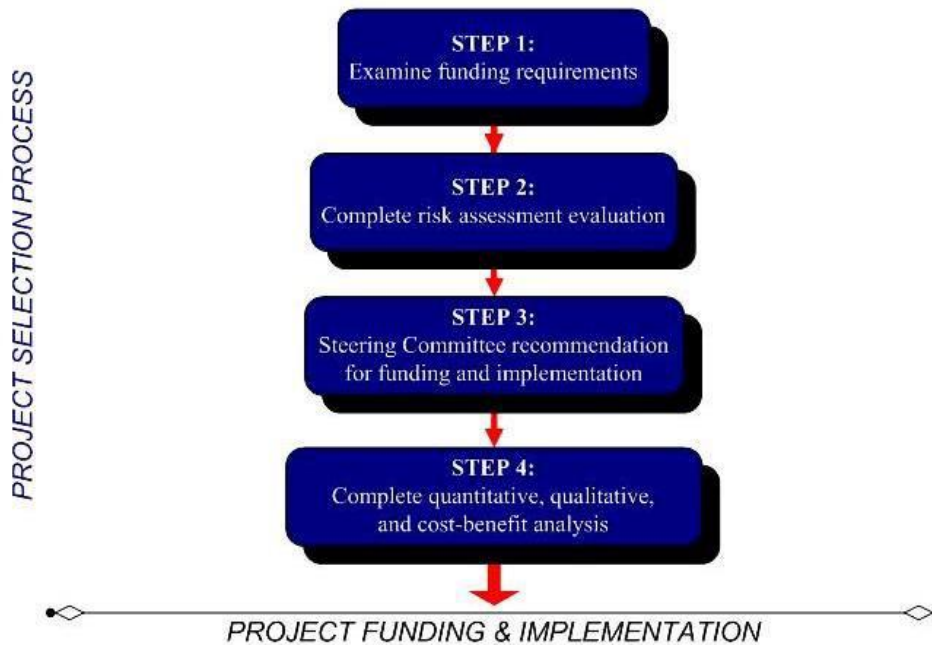
Chapter 3 describes the process the Steering Committee used to establish the current prioritization of action items. Understanding that priorities may change over time depending on new events or resource availability, the Disaster Mitigation Act of 2000 requires that jurisdictions identify a process for future action item prioritization. Potential mitigation activities often come from a variety of sources; therefore, the project prioritization process needs to be flexible. Committee members, local government staff, other planning documents or the risk assessment may be the source to identify projects. Figure 4-1 illustrates the project development and prioritization process that the Steering Committee can use in the future.

Step I: Examine funding requirements

The first step in prioritizing the NHMP's action items is to determine which funding sources are open for application. Several funding sources may be appropriate for the County's proposed mitigation projects. Examples of mitigation funding sources include but are not limited to: FEMA's Pre-Disaster Mitigation (PDM) competitive grant program, Hazard Mitigation Grant Program (HMGP), Flood Mitigation Assistance (FMA) grant program, National Fire Plan (NFP), Community Development Block Grants (CDBG), local general funds and private foundations, among others. Please see Volume II, Appendix F for a more comprehensive list of potential grant programs.

Because grant programs open and close on differing schedules, the Steering Committee will examine upcoming funding streams' requirements to determine which mitigation activities would be eligible. The Steering Committee may consult with the funding entity, OEM, or other appropriate state or regional organizations about project eligibility requirements. This examination of funding sources and requirements will happen during the Steering Committee's semi-annual NHMP maintenance meetings.

Figure 4-1 Action Item and Project Review Process



Source: Oregon Partnership for Disaster Resilience, 2008.

Step 2: Complete risk assessment evaluation

The second step in prioritizing the NHMP's action items is to examine which hazards the selected actions are associated with and where these hazards rank in terms of community risk. The Steering Committee will determine whether the NHMP's risk assessment supports the implementation of eligible mitigation activities. This determination will be based on the location of the potential activities, their proximity to known hazard areas and whether community assets are at risk. The Steering Committee will additionally consider whether the selected actions mitigate hazards that are likely to occur in the future or are likely to result in severe/catastrophic damages.

Step 3: Hazard Mitigation Advisory Committee Recommendation

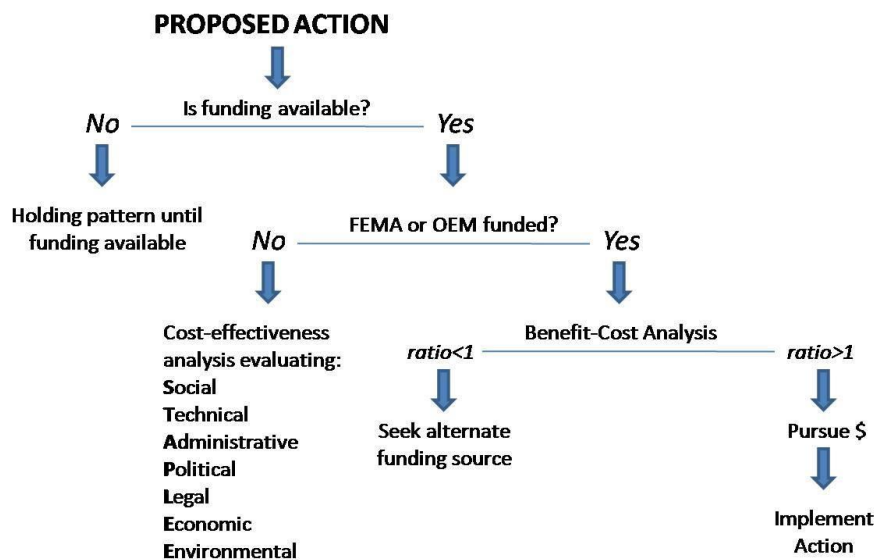
Based on the steps above, the Steering Committee will recommend which mitigation activities should be moved forward. If the Steering Committee decides to move forward with an action, the coordinating organization designated in the matrix will be responsible for taking further action and, if applicable, documenting success upon project completion. The Steering Committee will convene a meeting to review the issues surrounding grant applications and to share knowledge and/or resources. This process will afford greater coordination and less competition for limited funds.

Step 4: Complete quantitative and qualitative assessment and economic analysis

The fourth step is to identify the costs and benefits associated with the selected natural hazard mitigation strategies, measures or projects. Two categories of analysis that are used

in this step are: (1) cost-benefit analysis and (2) cost-effectiveness analysis. Conducting cost-benefit analysis for a mitigation activity assists in determining whether a project is worth undertaking now, in order to avoid disaster-related damages later. Cost-effectiveness analysis evaluates how best to spend a given amount of money to achieve a specific goal. Determining the economic feasibility of mitigating natural hazards provides decision makers with an understanding of the potential benefits and costs of an activity, as well as a basis upon which to compare alternative projects. Figure 4-2 shows decision criteria for selecting the appropriate method of analysis.

Figure 4-2 Benefit Cost Decision Criteria



Source: Oregon Partnership for Disaster Resilience, 2010.

If the activity requires federal funding for a structural project, the Steering Committee will use a FEMA-approved cost-benefit analysis tool to evaluate the appropriateness of the activity. A project must have a cost-benefit ratio of greater than one in order to be eligible for FEMA grant funding.

For non-federally funded or nonstructural projects, a qualitative assessment will be completed to determine the project's cost effectiveness. The Steering Committee will use a multivariable assessment technique called STAPLE/E to prioritize these actions. STAPLE/E stands for Social, Technical, Administrative, Political, Legal, Economic and Environmental. Assessing projects based upon these seven variables can help define a project's qualitative cost effectiveness. OPDR at the University of Oregon's Community Service Center has tailored the STAPLE/E technique for use in natural hazard action item prioritization.

Continued Public Involvement and Participation

The participating jurisdictions are dedicated to involving the public directly in the continual reshaping and updating of the Yamhill County NHMP. Although members of the Steering Committee represent the public to some extent, the public will also have the opportunity to continue to provide feedback about the NHMP.

To ensure that these opportunities will continue, the County and participating jurisdictions will:

- Post copies of their plan on corresponding websites;
- Place articles in the local newspaper directing the public where to view and provide feedback; and
- Use existing newsletters such as schools and utility bills to inform the public where to view and provide feedback.

In addition to the involvement activities listed above, Yamhill County will ensure continued public involvement by posting the Yamhill County NHMP on the county's [website](#). The NHMP will also be archived and posted on the University of Oregon Libraries' Scholar's Bank Digital Archive (<https://scholarsbank.uoregon.edu>).

Five-Year Review of NHMP

This NHMP will be updated every five years in accordance with the update schedule outlined in the Disaster Mitigation Act of 2000. **The Yamhill County NHMP is due to be updated before December 22, 2025.** The Convener will be responsible for organizing the Steering Committee to address NHMP update needs. The Steering Committee will be responsible for updating any deficiencies found in the NHMP and for ultimately meeting the Disaster Mitigation Act of 2000's NHMP update requirements.

The following 'toolkit' can assist the Convener in determining which NHMP update activities can be discussed during regularly scheduled NHMP maintenance meetings and which activities require additional meeting time and/or the formation of sub-committees.

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Table 4-1 Natural Hazard Mitigation Plan Update Toolkit

Question	Yes	No	Plan Update Action
Is the planning process description still relevant?			Modify this section to include a description of the plan update process. Document how the planning team reviewed and analyzed each section of the plan, and whether each section was revised as part of the update process. (This toolkit will help you do that).
Do you have a public involvement strategy for the plan update process?			Decide how the public will be involved in the plan update process. Allow the public an opportunity to comment on the plan process and prior to plan approval.
Have public involvement activities taken place since the plan was adopted?			Document activities in the "planning process" section of the plan update
Are there new hazards that should be addressed?			Add new hazards to the risk assessment section
Have there been hazard events in the community since the plan was adopted?			Document hazard history in the risk assessment section
Have new studies or previous events identified changes in any hazard's location or extent?			Document changes in location and extent in the risk assessment section
Has vulnerability to any hazard changed?			Document changes in vulnerability in the risk assessment section
Have development patterns changed? Is there more development in hazard prone areas?			Document changes in vulnerability in the risk assessment section
Do future annexations include hazard prone areas?			Document changes in vulnerability in the risk assessment section
Are there new high risk populations?			Document changes in vulnerability in the risk assessment section
Are there completed mitigation actions that have decreased overall vulnerability?			Document changes in vulnerability in the risk assessment section
Did the plan document and/or address National Flood Insurance Program repetitive flood loss properties?			Document any changes to flood loss property status

Source: Oregon Partnership for Disaster Resilience, 2010.

Table 4-1 Natural Hazard Mitigation Plan Update Toolkit (continued)

Question	Yes	No	Plan Update Action
Did the plan identify the number and type of existing and future buildings, infrastructure, and critical facilities in hazards areas?			1) Update existing data in risk assessment section, or 2) determine whether adequate data exists. If so, add information to plan. If not, describe why this could not be done at the time of the plan update
Did the plan identify data limitations?			If yes, the plan update must address them: either state how deficiencies were overcome or why they couldn't be addressed
Did the plan identify potential dollar losses for vulnerable structures?			1) Update existing data in risk assessment section, or 2) determine whether adequate data exists. If so, add information to plan. If not, describe why this could not be done at the time of the plan update
Are the plan goals still relevant?			Document any updates in the plan goal section
What is the status of each mitigation action?			Document whether each action is completed or pending. For those that remain pending explain why. For completed actions, provide a 'success' story.
Are there new actions that should be added?			Add new actions to the plan. Make sure that the mitigation plan includes actions that reduce the effects of hazards on both new and existing buildings.
Is there an action dealing with continued compliance with the National Flood Insurance Program?			If not, add this action to meet minimum NFIP planning requirements
Are changes to the action item prioritization, implementation, and/or administration processes needed?			Document these changes in the plan implementation and maintenance section
Do you need to make any changes to the plan maintenance schedule?			Document these changes in the plan implementation and maintenance section
Is mitigation being implemented through existing planning mechanisms (such as comprehensive plans, or capital improvement plans)?			If the community has not made progress on process of implementing mitigation into existing mechanisms, further refine the process and document in the plan.

Source: Oregon Partnership for Disaster Resilience, 2010.

Volume II: Jurisdictional Addenda

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City of Amity Addendum to the Yamhill County Multi-Jurisdictional Hazard Mitigation Plan



Photo Credit: Gary Halvorson, Oregon State Archives

Effective: December 22, 2020 through December 21, 2025



Prepared for:

City of Amity

Prepared by:

**University of Oregon
Institute for Policy Research and Engagement
Oregon Partnership for Disaster Resilience**

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FEMA

January 20, 2021

The Honorable Casey Kulla
Chair Kulla, Yamhill County Board of Commissioners
535 NE 5th St.
McMinnville, Oregon 97128

Dear Chair Kulla:

On December 22, 2020, the U.S. Department of Homeland Security's Federal Emergency Management Agency (FEMA) Region 10, approved the Yamhill County Hazard Mitigation Plan as a multi-jurisdictional local plan as outlined in Code of Federal Regulations Title 44 Part 201. This approval provides the below jurisdictions eligibility to apply for the Robert T. Stafford Disaster Relief and Emergency Assistance Act's, Hazard Mitigation Assistance grants projects through December 21, 2025, through your state:

Yamhill County	City of Amity	City of Carlton	City of Dayton
City of McMinnville	City of Newberg	City of Sheridan	City of Yamhill

FEMA individually evaluates all application requests for funding according to the specific eligibility requirements of the applicable program. Though a specific mitigation activity or project identified in the plan may meet the eligibility requirements, it may not automatically receive approval for FEMA funding under any of the aforementioned programs.

Approved mitigation plans may be eligible for points under the National Flood Insurance Program's Community Rating System (CRS). For additional information regarding the CRS, please visit: www.fema.gov/national-flood-insurance-program-community-rating-system or contact your local floodplain manager. Over the next five years, we encourage your communities to follow the plan's schedule for monitoring and updating, and to develop further mitigation actions. To continue eligibility, jurisdictions must review, revise as appropriate, and resubmit the plan within five years of the original approval date.

If you have questions regarding your plan's approval or FEMA's mitigation grant programs, please contact Joseph Murray, Planner with Oregon Office of Emergency Management, at (503) 378-2911, who locally coordinates and administers these efforts.

Sincerely,

Kristen Meyers, Director
Mitigation Division

Enclosure

cc: Amie Bashant, Oregon Office of Emergency Management

EG:vl

RESOLUTION 2020-14

A RESOLUTION ADOPTING THE CITY OF AMITY REPRESENTATION IN THE UPDATES TO THE YAMHILL COUNTY MULTI-JURISDICTIONAL NATURAL HAZARD MITIGATION PLAN

The City of Amity hereby resolves as follows:

Whereas, the City of Amity recognizes the threat that natural hazards pose to people, property and infrastructure within our community; and

Whereas, undertaking hazard mitigation actions will reduce the potential for harm to people, property and infrastructure from future hazard occurrences; and

Whereas, an adopted Natural Hazards Mitigation Plan (NHMP) is required as a condition of future funding for mitigation projects under multiple FEMA pre- and post-disaster mitigation grant programs; and

Whereas, the City of Amity has fully participated in the FEMA prescribed mitigation planning process to prepare the *Yamhill County, Multi-Jurisdictional Natural Hazard Mitigation Plan*, which has established a comprehensive, coordinated planning process to eliminate or minimize these vulnerabilities; and

Whereas, the City of Amity has identified natural hazard risks and prioritized a number of proposed actions and programs needed to mitigate the vulnerabilities of the City of Amity to the impacts of future disasters within the *Yamhill County, Multi-Jurisdictional Natural Hazard Mitigation Plan*; and

Whereas, these proposed projects and programs have been incorporated into the *Yamhill County, Multi-Jurisdictional Natural Hazard Mitigation Plan* that has been prepared and promulgated for consideration and implementation by the cities of Yamhill County; and

Whereas, the Oregon Office of Emergency Management and Federal Emergency Management Agency, Region X officials have reviewed the *City of Amity addendum* to the *Yamhill County Multi-Jurisdictional Natural Hazard Mitigation Plan* and pre-approved it (dated, September 10, 2020) contingent upon this official adoption of the participating governments and entities;

Whereas, the NHMP is comprised of three volumes: Volume I: Basic Plan, Volume II: Jurisdictional Addenda, and Volume III: Appendices, collectively referred to herein as the NHMP; and

Whereas, the NHMP is in an on-going cycle of development and revision to improve its effectiveness; and

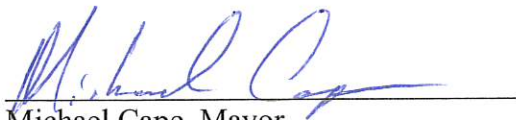
Whereas, City of Amity adopts the NHMP and directs the City Administrator and Public Works Superintendent to develop, approve, and implement the mitigation strategies and any administrative changes to the NHMP.

Now, therefore, be it resolved, that the City of Amity adopts *the Yamhill County Multi-Jurisdictional Natural Hazards Mitigation Plan* as an official plan; and

Be it further resolved, that the City of Amity will submit this Adoption Resolution to the Oregon Office of Emergency Management and Federal Emergency Management Agency, Region X officials to enable final approval of the *Yamhill County Multi-Jurisdictional Natural Hazards Mitigation Plan*.

Adopted by the City Council this 4th day of November, 2020.

Approved by the Mayor this 4th day of November, 2020.



Michael Cape, Mayor
Certifying Official

Attest:



Natasha Johnson, City Recorder

Purpose

This is an update of the Amity addendum to the Yamhill County Multi-Jurisdictional Natural Hazard Mitigation Plan (NHMP). This addendum supplements information contained in Volume I (Basic Plan) which serves as the NHMP foundation, and Volume III (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 Amity's addendum are further discussed throughout the NHMP, and within Volume III, Appendix B, which provides an overview of alterations to the document that took place during the update process.

Amity adopted their addendum to the Yamhill County Multi-jurisdictional NHMP on **November 4, 2020**. FEMA Region X approved the Yamhill County NHMP and the City's addendum on **December 22, 2020**. With approval of this NHMP the City is now eligible to apply for the Robert T. Stafford Disaster Relief and Emergency Assistance Act's hazard mitigation project grants through **December 21, 2025**.

Mitigation Plan Mission

The NHMP mission states the purpose and defines the primary functions of the 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 City concurs with the mission statement developed during the Yamhill County planning process (Volume I, Section 3):

To promote public policy and mitigation activities which will enhance the safety to life and property from natural hazards.

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

Mitigation Plan Goals

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

The City concurs with the goals developed during the Yamhill County planning process (Volume I, Section 3). All NHMP goals are important and are listed below in no 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.

Below is a list of the NHMP goals:

GOAL 1: EMERGENCY OPERATIONS

- Coordinate natural hazard mitigation activities, where appropriate, with emergency operations plans and procedures and with other agencies.

GOAL 2: EDUCATION AND OUTREACH

- Develop and implement education and outreach programs to increase public awareness of the risks associated with natural hazards.

GOAL 3: PARTNERSHIPS

- Develop effective partnerships with public and private sector organizations and significant agencies and businesses for future natural hazard mitigation efforts.
- Coordinate natural hazard mitigation actions between the County and local jurisdictions to create more cohesive and effective hazard mitigation efforts.

GOAL 4: PREVENTIVE

- Develop and implement activities to protect human life, commerce, and property from natural hazards.
- Reduce losses and repetitive damage for chronic hazard events while promoting insurance coverage for catastrophic hazards.

GOAL 5: NATURAL RESOURCES UTILIZATION

- Link natural resources management, land use planning, and watershed planning with natural hazard mitigation activities to protect natural systems and allow them to serve natural hazard mitigation functions.

GOAL 6: IMPLEMENTATION

- Implement strategies to mitigate the effects of natural hazards and increase the quality of life and resilience of economies in Yamhill County.

GOAL 7: DEVELOPMENT

- Communities appropriately apply development standards that consider the potential impacts of natural hazards.

GOAL 8: DOCUMENTATION

- Document and evaluate progress in achieving hazard mitigation strategies and action items.

Process and Participation

This section of the NHMP addendum addresses 44 CFR 201.6(a)(3), *Participation*.

In addition to establishing a comprehensive community-level mitigation strategy, the Disaster Mitigation Act of 2000 (DMA2K), and the regulations contained in 44 CFR 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 pre-, and post-disaster mitigation project grants.

The Oregon Partnership for Disaster Resilience (OPDR) at the University of Oregon's Institute for Policy Research and Engagement (IPRE) collaborated with the Oregon Office of Emergency Management (OEM), Yamhill County, and Amity to update their NHMP. This project is funded through the Federal Emergency Management Agency's (FEMA) Hazard Mitigation Grant Program for DR-4328 (HMGP-DR-4328-OR-5-P). Members of the Amity NHMP Steering committee also participated in the County NHMP update process (Volume III, Appendix B).

The Yamhill County NHMP, and Amity addendum, are the result of a collaborative effort between citizens, public agencies, non-profit organizations, the private sector, and regional organizations. The Amity NHMP Steering Committee guided the process of developing the NHMP.

Convener and Committee

The Amity City Administrator serves as the NHMP addendum convener. The convener of the NHMP will take the lead in implementing, maintaining, and updating the addendum to the Yamhill County NHMP in collaboration with the designated convener of the Yamhill County NHMP (Yamhill County Emergency Manager).

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

This addendum reflects decisions made at the designated meetings, and during subsequent work, and communication with Yamhill County Emergency Manager, and 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, action items, and community profile.

The Amity steering committee was comprised of the following representatives:

- Convener, Michael Thomas, City Administrator
- Gary Mathis, Public Works Superintendent
- Scott Law, Chief Amity Fire District
- Jeff Clark, Amity Public Schools Superintendent

Public Participation

Public participation was achieved by posting the NHMP publicly and providing community members the opportunity to make comments and suggestions during the review process. Community members were also provided an opportunity for comment via a survey administered by IPRE (Volume III, Appendix F). During the City public review period (Attachment B) there were no comments provided.

Implementation and Maintenance

The City Council will be responsible for adopting the Amity addendum to the Yamhill County NHMP. This addendum designates the 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 Amity 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 Administrator 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; 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 City will utilize the same action item prioritization process as the County (Volume I, Section 4).

Implementation through Existing Programs

This NHMP is strategic and non-regulatory in nature, meaning that it does not necessarily set forth any new policy. It does, however, provide: (1) a foundation for coordination and collaboration among agencies and the public in the city; (2) identification and prioritization of future mitigation activities; and (3) aid in meeting federal planning requirements and qualifying for assistance programs. The mitigation plan works in conjunction with other city plans and programs including the Comprehensive Land Use Plan, Capital Improvements Plan, and Building Codes, as well as the [Yamhill County NHMP](#), and the [State of Oregon NHMP](#).

The mitigation actions described herein (and priority actions in Attachment A) 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, Amity 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. Implementation opportunities are further defined in action items when applicable.

Future development without proper planning may result in worsening problems associated with natural hazards. Amity's acknowledged comprehensive plan is the City of Amity Comprehensive Plan. The City implements the plan through the Community Development Code.

Amity currently has the following plans that relate to natural hazard mitigation. For a complete list visit the City's [website](#):

- [Comprehensive Plan](#) (1979, revised 2015)
- [Amity Development Code, and City Code \(revised April 2020\)](#)
- Building Code, [2017 Oregon State Building Code](#) based on 2015 International Residential Code (IRC), and 2012 International Building Code (*to be updated to the 2020 Oregon State Building Code, anticipated October 2020*)
- [Emergency Operations Plan](#) (2013)
- [Transportation System Plan](#) (2015)
- Water System Master Plan

Other plans:

- [Yamhill County Community Wildfire Protection Plan](#) (2009, revised Nov. 2015)

Government Structure

The Amity City Charter establishes a Mayor-Council form of government, which vests policy authority in a volunteer City Council, and administrative authority for day-to-day operations in an appointed, professional City Administrator. The Amity City Council consists of a Mayor and six Councilors who serve four-year terms. At least three Council positions are up for election every two years. Councilors are elected at-large. The three candidates who receive the highest number of votes are elected to the vacant seats. The Council meets at least once per month at City Hall. The agenda of each meeting includes time for citizen comment.

The City of Amity currently has the following departments which have a role in natural hazard mitigation:

Administration services are provided by the City Administrator and include strategic planning, budget and finance, and development of public policy recommendations to the City Council.

Public Works provides many of the basic urban services to the citizens of Amity, including water, sanitary sewer, and storm drainage systems, and their maintenance and repair. The Department is divided into three divisions: Maintenance, Operations, and Engineering.

Building services are provided through a contract with Yamhill County and include plan review and inspections on commercial, industrial and residential developments.

Planning services are provided through a contract with the Mid-Willamette Valley Council of Government and includes all long range and current planning for new development, as well as the City's flood plain management zone. Planning is also responsible for implementation of the Comprehensive Plan.

Police services are provided through a contract with Yamhill County Sheriff's Office. In addition to law enforcement activities police services include emergency management (emergency preparedness, mitigation, response and recovery efforts for Amity during emergencies, disasters, or disruptions).

Fire protection services are provided through a contract with Amity Fire District which includes emergency response to more than 3,000 residents (including city residents) over 85 square miles. The main fire station is in Amity and a substation is 10 miles southwest in Perrydale. Emergency services include fire suppression, water and dive rescue operations, hazardous materials incidents, and disaster response. In addition, emergency medical response is provided via a partnership with the McMinnville Fire Department which provides a staffed ambulance located at the Amity Fire Station during the week and responds via McMinnville on weekends. Non-emergency services include fire prevention and inspection services, code enforcement, public safety education services/CPR training, fire extinguisher use, residential safety surveys, home fire escape planning, emergency and disaster preparedness planning and training for citizens (CERT), and fire and life safety education in Amity schools.

Continued Public Participation

An open public involvement process is essential to the development of an effective NHMP. To develop a comprehensive approach to reducing the effects of natural disasters, the planning process shall include opportunities for the public, neighboring communities, local, and regional agencies, as well as, private, and non-profit entities to comment on the NHMP during review.¹ Keeping the public informed of efforts to reduce its risk to future natural hazard events is important for successful NHMP implementation, and maintenance. As such, the City is committed to involving the public in the NHMP review and update process (Volume I, Section 4). The City posted the plan update for public comment before FEMA approval, and after approval will maintain the plan on the City's website:

<https://www.cityofamityoregon.org/>

NHMP Maintenance

The Yamhill County NHMP, and City addendum will be updated every five years in accordance with the update schedule outlined in the Disaster Mitigation Act of 2000. During the County NHMP update process, the City will also review, and update its addendum (Volume I, Section 4). The convener will be responsible for convening the steering committee to address the questions outlined below.

- Are there new partners that should be brought to the table?
- Are there new local, regional, state or federal policies influencing natural hazards that should be addressed?

¹ Code of Federal Regulations, Chapter 44. Section 201.6, subsection (b). 2015

- Has the community successfully implemented any mitigation activities since the NHMP was last updated?
- Have new issues or problems related to hazards been identified in the community?
- Are the actions still appropriate given current resources?
- Have there been any changes in development patterns that could influence the effects of hazards?
- Have there been any significant changes in the community's demographics that could influence the effects of hazards?
- Are there new studies or data available that would enhance the risk assessment?
- Has the community been affected by any disasters? Did the NHMP accurately address the impacts of this event?

These questions will help the steering committee determine what components of the mitigation plan need updating. The steering committee will be responsible for updating any deficiencies found in the NHMP.

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) were first developed during the 2009 NHMP planning process and revised during subsequent NHMP updates. During these processes, the steering committee assessed the City's risk, identified potential issues, and developed a mitigation strategy (action items).

During the 2019-2020 update process the City re-evaluated their mitigation strategy (action items). During this process action items were updated, noting what accomplishments had been made, and whether the actions were still relevant; any new action items were identified at this time (see Volume III, Appendix B for more information on changes to action items).

Priority Action Items

Table AA-1 presents a list of mitigation actions. The steering committee 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 in **bold** text with grey 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 steering committee in terms of implementation, the steering committee 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 detailed information for each high priority action. Full text of the plan goals referenced in Table AA-1 is located on page AA-2.

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Table AA-I Amity Action Items

Natural Hazard Action ID	Action Item	Coordinating Organization (Lead)	Partners	Potential Funding	Cost	Timing	Plan Goals Addressed							
							Goal 1	Goal 2	Goal 3	Goal 4	Goal 5	Goal 6	Goal 7	Goal 8
Multi-Hazard Actions														
Multi-Hazard #1	Develop, enhance, and implement public education and information materials concerning mitigation, preparedness and safety procedures for identified natural hazards.	Public Works	Yamhill Co. Emergency Management, Sheriff's Office	General fund, grants	L	Ongoing	✓	✓	✓			✓	✓	
Multi-Hazard #2	Cross reference and incorporate mitigation planning provisions into all community planning processes such as comprehensive, capital improvement, land use, transportation plans, etc. to demonstrate multi-benefit considerations and facilitate using multiple funding source consideration.	Planning	Public Works, Administration	General fund, utility rates	L	Medium	✓			✓	✓	✓	✓	
Multi-Hazard #3	Review ordinances and develop outreach programs to assure mobile homes and manufactured buildings are protected from natural hazards. (Anchoring, elevation, and other methods as applicable)	Administration	City Engineer (Keller Associates)	General fund, utility rates	L	Medium				✓	✓	✓	✓	
Multi-Hazard #4	Install lightning rods and lightning grade surge protection devices on critical electronic components such as warning systems, communications equipment, and computers for critical facilities.	Public Works	City Engineer (Keller Associates)	General fund, grants	M	Medium	✓	✓			✓	✓	✓	

Natural Hazard Action ID	Action Item	Coordinating Organization (Lead)	Partners	Potential Funding	Cost	Timing	Plan Goals Addressed							
							Goal 1	Goal 2	Goal 3	Goal 4	Goal 5	Goal 6	Goal 7	Goal 8
Multi-Hazard #5	Plan for solar + battery storage systems, which can serve as mini power-supply stations or provide residents the ability to shelter in place after any electricity supply-disrupting event, at varying scales (project, neighborhood and district) and locations (critical City facilities, low-income housing, community gathering spots).	Public Works	PGE	General fund, grants, Utility rates	H	Long	✓		✓	✓		✓		✓
Multi-Hazard #6	Develop mitigation strategy for structures in hazard prone area. Restrict public from building/rebuilding in hazard areas. Acquire, demolish, or relocate structures from hazard prone area. Property deeds shall be restricted for open space uses in perpetuity to keep people from rebuilding in hazard areas.	Administration	YCSO, Planning (MWVCOG), Public Works	General funds, grants, private investment	H	Long		✓	✓	✓	✓	✓		✓
Multi-Hazard #7	Encourage utility companies to evaluate and harden vulnerable infrastructure elements for sustainability.	Administration	Public Works	Utility fees, private investment	H	Ongoing	✓		✓	✓		✓		✓
Drought Actions														
Drought #1	Complete water system improvements to ensure adequate storage and capacity.	Public Works	Administration	General fund, utility rates, grants	H	Medium			✓	✓		✓		✓

Natural Hazard Action ID	Action Item	Coordinating Organization (Lead)	Partners	Potential Funding	Cost	Timing	Plan Goals Addressed								
							Goal 1	Goal 2	Goal 3	Goal 4	Goal 5	Goal 6	Goal 7	Goal 8	
Earthquake Actions															
Earthquake #1	Conduct seismic strength evaluations of critical facilities and infrastructure to identify vulnerabilities and seismically retrofit (structural and nonstructural) identified critical facilities and infrastructure to meet life safety standards in order to continue operations post-earthquake.	Administration	Public Works, Planning (MWVCOG), City Engineer (Keller Associates)	General funds, utility fees, grants, SRGP	H	Long		✓	✓	✓			✓	✓	✓
Earthquake #2	Supplement State Seismic Needs Analysis data (schools, fire, law enforcement). Complete inventory of public and commercial buildings that may be particularly vulnerable to earthquake damage.	Administration	Public Works, City Engineer (Keller Associates)	General fund, utility fees, grants	M	Medium		✓	✓	✓			✓	✓	✓
Earthquake #3	Encourage utility companies to evaluate and harden vulnerable infrastructure elements.	Administration	Public Works, City Engineer (Keller Associates)	General fund, permit fees	L	Long		✓	✓	✓			✓	✓	✓
Flood Actions															
Flood #1	Ensure continued compliance in the National Flood Insurance Program (NFIP) through enforcement of local floodplain management ordinances.	Community Development	Emergency Management; Public Works	General fund	L	Ongoing	✓	✓	✓	✓	✓	✓	✓	✓	✓
Flood #2	Create high water overflow conveyance systems and detention storage basins, ponds, reservoirs etc. to allow water to temporarily	Public Works	Administration	General fund, HMA	H	Long	✓		✓	✓			✓		✓

Natural Hazard Action ID	Action Item	Coordinating Organization (Lead)	Partners	Potential Funding	Cost	Timing	Plan Goals Addressed							
							Goal 1	Goal 2	Goal 3	Goal 4	Goal 5	Goal 6	Goal 7	Goal 8
	accumulate to reduce pressure on culverts and low water crossings. Water ultimately returning to its watercourse at a reduced flow rate.													
Flood #3	Isolate and improve existing wastewater system that currently has poor hydraulic gradient not up to codes.	Public Works	OAWU, DEQ	General fund, utility fees, HMA	H	Long	✓		✓	✓		✓		✓
Flood #4	Develop and maintain GIS mapped critical facility inventory for all structures and residential and commercial buildings located within 100-year and 500-year floodplains.	Administration	Public Works, City Planning (MWVCOG)	General fund	L	Long	✓		✓	✓		✓		✓
Flood #5	Acquire, relocate, elevate, or otherwise flood-proof critical facilities.	Administration	Public Works, City Planning (MWVCOG)	General fund, HMA	H	Long		✓	✓			✓		✓
Flood #6	Relocate wastewater lift stations (2) outside of the 100-year floodplain	Public Works	City Engineer (Keller Associates), Administration	General fund, HMA	H	Short			✓	✓		✓		✓

Landslide Actions

No actions identified at this time.

Severe Weather Actions (Windstorm and Winter Storms – Snow/Ice)

Severe Weather #1	Develop, implement, and maintain partnership program with electrical utilities to use underground utility placement methods where possible to reduce or eliminate power outages from severe winter storms.	Public Works	Community Development	General fund, Utility fees	M	Ongoing	✓	✓	✓			✓		✓
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Natural Hazard Action ID	Action Item	Coordinating Organization (Lead)	Partners	Potential Funding	Cost	Timing	Plan Goals Addressed							
							Goal 1	Goal 2	Goal 3	Goal 4	Goal 5	Goal 6	Goal 7	Goal 8
	Consider developing incentive programs. Develop and implement tree clearing mitigation programs to keep trees from threatening lives, property, and public infrastructure from severe weather events.													
Severe Weather #2	Develop critical facility list needing emergency back-up power systems. Review critical facilities and government building energy efficiency, winter readiness, and electrical protection capability. Identify, prioritize, and implement infrastructure upgrade or rehabilitation project prioritization and development.	Administration	Public Works	General funds, utility fees, grants	L	Medium		✓		✓		✓		✓
Severe Weather #3	Purchase NOAA Weather radios and develop a web portal linking residents to various weather information sites. (NWS, FEMA, The Weather Channel). Develop early warning test program partnering with NOAA, City Police, Fire Departments, and Volunteer Fire Department to coordinate tests.	Administration	Yamhill Co. Emergency Management, Sheriff's Office, Amity Fire	General funds, grants	L	Short		✓		✓		✓		✓
Volcanic Event Actions														
Volcanic Event #1	Evaluate capability of water treatment plants to deal with high	Public Works	Administration	General funds,	L	Long				✓	✓	✓		✓

Natural Hazard Action ID	Action Item	Coordinating Organization (Lead)	Partners	Potential Funding	Cost	Timing	Plan Goals Addressed							
							Goal 1	Goal 2	Goal 3	Goal 4	Goal 5	Goal 6	Goal 7	Goal 8
	turbidity from ash falls, update emergency response plans, and upgrade treatment facilities' physical plant to deal with ash falls. Evaluate ash impact on storm water drainage system.			utility fees, grants										
Wildfire Actions														
Wildfire #1	Coordinate wildfire mitigation action items through the Yamhill County Community Wildfire Protection Plan.	Amity Fire District	Administration	General fund, ODF, grants	M	Ongoing	✓	✓	✓	✓	✓	✓	✓	✓
Wildfire #2	Develop outreach program to educate and encourage home landscape cleanup (defensible space) and define debris disposal programs. Adopt, and enforce burn ordinances that require burn permits, restricts campfires, and controls outdoor burning.	Amity Fire District	Administration	General fund, utility fees	L	Short		✓	✓	✓	✓	✓	✓	✓
Wildfire #3	Identify evacuation routes away from high hazard areas and develop outreach program to educate the public concerning warnings and evacuation procedures. Update list of critical facilities and vulnerable populations based on mapped high hazard areas.	Amity Fire District	Administration, Yamhill Co. Emergency Management, Public Works	General fund, grants	L	Short		✓	✓	✓	✓	✓	✓	✓

Source: City of Amity steering committee, 2020.

Note: Full text of the plan goals referenced in this table is located on page AA-2.

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, Section 2, and Volume III, Appendix C. The risk assessment process is graphically depicted in Figure AA-1. Ultimately, the goal of hazard mitigation is to reduce the area of risk, where hazards overlap vulnerable systems.

Figure AA-1 Understanding Risk



Hazard Analysis

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

Table AA-2 shows the HVA matrix for Amity 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 sense of hazard priorities but does not predict the occurrence of a hazard.

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

Table AA-2 Hazard Analysis Matrix

Hazard	Maximum				Total Threat Score	Hazard Rank	Hazard Tiers
	History	Vulnerability	Threat	Probability			
Winter Storm	16	40	80	56	192	#1	Top Tier
Earthquake - Cascadia	6	45	100	35	186	#2	
Flood	14	40	70	56	180	#3	
Windstorm	16	25	70	56	167	#4	Middle Tier
Drought	8	30	50	56	144	#5	
Earthquake - Crustal	6	20	60	21	107	#6	
Wildfire	6	15	50	21	92	#7	Bottom Tier
Landslide	2	10	20	7	39	#8	
Volcanic Event	2	5	20	7	34	#9	

Source: Amity steering committee, 2019-2020.

Table AA-3 categorizes the probability, and vulnerability scores from the hazard analysis for the City and compares the results to the assessment completed by the Yamhill County steering committee. Variations between the City, and County are noted in **bold** text within the city ratings.

Table AA-3 Probability and Vulnerability Comparison

Hazard	Amity		Yamhill County	
	Probability	Vulnerability	Probability	Vulnerability
Drought	High	Moderate	High	Moderate
Earthquake - Cascadia	Moderate	High	Moderate	High
Earthquake - Crustal	Low	Moderate	Low	Moderate
Flood	High	High	High	High
Landslide	Low	Low	High	Low
Volcanic Event	Low	Low	Low	Low
Wildfire	Low	Low	Low	Low
Windstorm	High	Moderate	High	Moderate
Winter Storm	High	High	High	High

Source: Amity and Yamhill County steering committee, 2019-2020.

Community Characteristics

Table AA-4 and the following section provides information on City specific demographics, and assets. 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. Between 2012 and 2019 the City grew by 60 people (4%).² According to the State's official coordinated population forecast, between 2019 and 2040 the City's population is forecast to grow by 18% to 1,975.³ *Note: the State is currently updating the official forecast and the proposed 2040 population is 2,029 which represents a 21% increase from 2019 population.*⁴ Median household income increased by 3% between 2012 and 2017.⁵

There are two major housing development since the previous plan that are either completed or underway: an 24 unit apartment complex along Highway 99W in downtown Amity, and a 24 unit housing development in the southwest by the city park, a new 16 unit development is underway (2019-2020) near the elementary school. Another 10 unites (5 duplexes) were developed over the last several years. New development has complied with the standards of the [Oregon Building Code](#), and the city's development code including their floodplain ordinance.

Economy

The City of Amity is in the southeast corner of Yamhill County along Highway 99W. The economy of Amity is largely related to agriculture and supporting services. Amity's commercial areas developed along primary routes, and residential development followed nearby (see Figure AA-2).

The largest single employer in the City is Amity Public Schools, followed by Coelho Winery. The remaining businesses in the City employ 25 workers or less. Most workers residing in the city (98%, 67 people) travel outside of the city for work primarily to McMinnville, Salem, Portland Metro area, and Newberg.⁶

Amity residents are employed in a variety of occupations including: sales (13%), professional (13%), production (11%), construction, extraction, and maintenance (9%), food preparation and serving (8%), and building and grounds cleaning and maintenance (8%) occupations.⁷

² Portland State University, Population Research Center, "Annual Population Estimates", 2019.

³ Portland State University, Population Research Center, "Oregon Population Forecast Program Cycle 1 (2014-2017)". 2017.

⁴ Portland State University, Population Research Center, "Oregon Population Forecast Program Cycle 2 (2018-2020)". 2020 (proposed).

⁵ Social Explorer, Table T57, U.S. Census Bureau, 2013-2017 and 2008-2012 American Community Survey Estimates.

⁶ U.S. Census Bureau. LEHD Origin-Destination Employment Statistics (2002-2017). Longitudinal-Employer Household Dynamics Program, accessed on April 25, 2020 at <https://onthemap.ces.census.gov>.

⁷ Social Explorer, Table A17008, U.S. Census Bureau, 2013-2017 American Community Survey Estimates.

Table AA-4 Community Characteristics

Population Characteristics		
2012 Population	1,610	
2019 Population	1,670	
2040 Forecasted Pop. [Proposed]*	1,975 [2,029]	
Race (non-hispanic) and Ethnicity (Hispanic)		
White	74%	
Black/ African American	0%	
American Indian and Alaska Native	3%	
Asian	0%	
Native Hawaiian and Other Pacific Islander	0%	
Some Other Race	0%	
Two or More Races	5%	
Hispanic or Latino	18%	
Limited or No English Spoken	1%	
Vulnerable Age Groups		
Less than 15 Years	427	15%
65 Years and Over	194	11%
Disability Status		
Total Population	343	20%
Children	20	4%
Seniors	111	57%
Income Characteristics		
Households by Income Category		
Less than \$15,000	85	14%
\$15,000-\$29,999	55	9%
\$30,000-\$44,999	95	16%
\$45,000-\$59,999	109	18%
\$60,000-\$74,999	75	13%
\$75,000-\$99,999	99	17%
\$100,000-\$199,999	74	13%
\$200,000 or more	-	0%
Median Household Income	\$53,958	
Poverty Rates		
Total Population	320	19%
Children	109	23%
Seniors	24	12%
Housing Cost Burden		
Owners with Mortgage	83	23%
Renters	72	32%

Source: U.S. Census Bureau, 2013-2017 American Community Survey; Portland State University, Population Research Center, "Annual Population Estimates", 2019. Portland State University, Population Research Center, "Oregon Population Forecast Program Cycle 1 (2014-2017)". 2017. and "Oregon Population Forecast Program Cycle 2 (2018-2020)". 2020 (proposed).

Housing Characteristics		
Housing Units		
Single-Family	544	83%
Multi-Family	29	4%
Mobile Homes	81	12%
Year Structure Built		
Pre-1970	248	38%
1970-1989	267	41%
1990-2009	139	21%
2010 or later	0	0%
Housing Tenure and Vacancy		
Owner-occupied	363	56%
Renter-occupied	229	35%
Seasonal	10	2%
Vacant	52	8%

Amity is in the southeastern corner of Yamhill County. The Yamhill River is approximately 7 miles east of the city and there are two drainage basins within the city: Ash Swale and Salt.

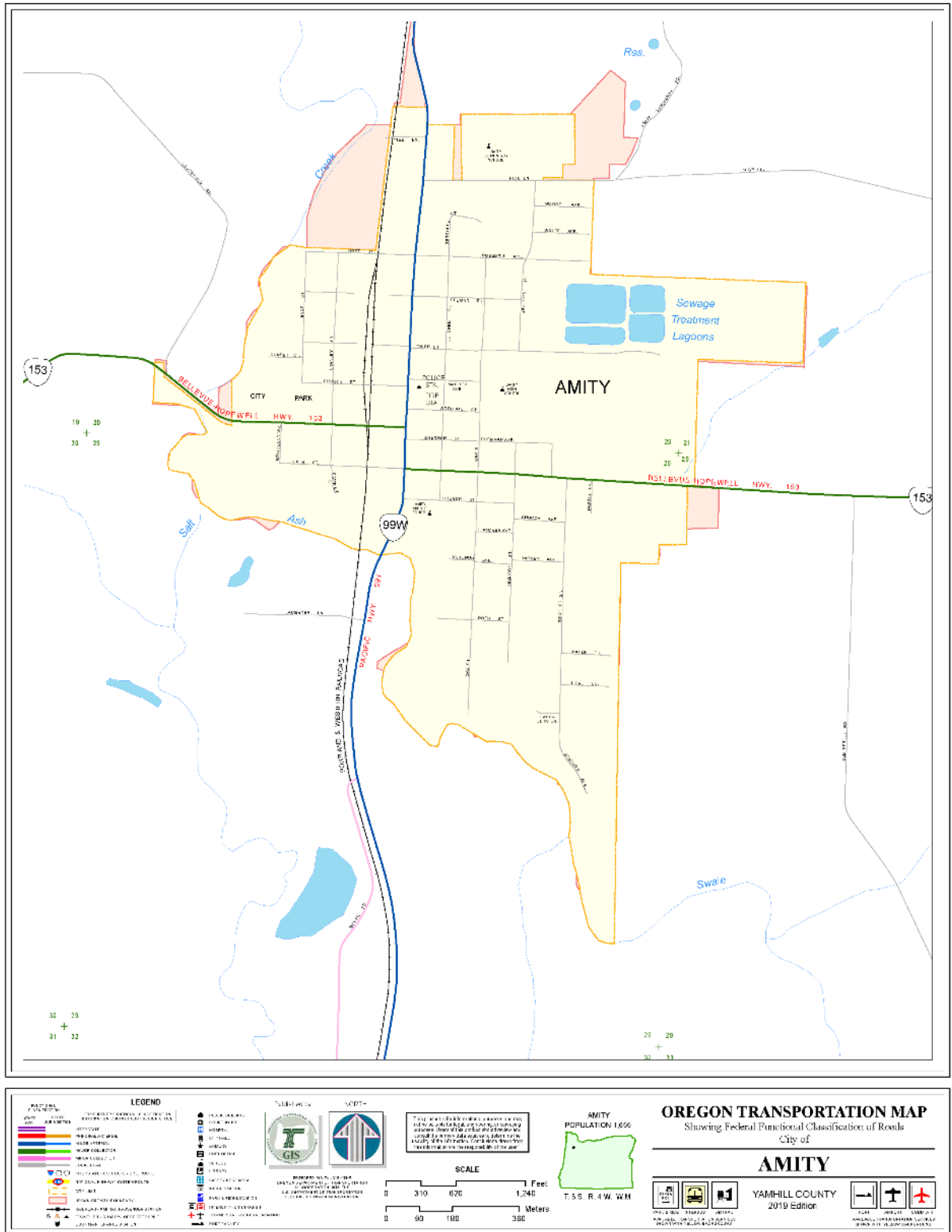
Amity is generally flat and has gently rolling hills to the north and northeast of the city. Soils in Amity are moderately well-drained silt loams of the Amity and Woodburn series. The area is largely agricultural with uncultivated vegetation consisting of scattered Oak and Douglas Fir.

Amity's temperatures range from a monthly average low of 34-38°F in the winter months to average highs of 75-83°F in the summer months. The coolest month is December and the warmest months are July and August. The average annual precipitation is about 42 inches and approximately 80% falls between November and April.

The City has an educated population with 90% of residents 25 years, and older holding a high school degree and 25% have a bachelor's degree or higher. The Amity High School has a 98% graduation rate as of 2019.

Amity includes industrial and commercial development but is zoned primarily residential.

Figure AA-2 Oregon Transportation Map: City of Amity



Source: Oregon Department of Transportation

Community Assets

This section outlines the resources, facilities, and infrastructure that, if damaged, could significantly impact the public safety, economic conditions, and environmental integrity of Amity.

Critical facilities and infrastructure are those that support government and first responders' ability to act in an emergency. They are a top priority in any comprehensive hazard mitigation plan. These include locally designated shelters and other essential assets, such as fire stations, and water and wastewater treatment facilities (see Table AA-5). **Essential facilities and infrastructure** are those that support the continued delivery of key government services, and/or that may significantly impact the public's ability to recover from the emergency. These facilities may include: City buildings and other public facilities such as schools.

It is important to note that the facilities identified as "critical" and "essential" are characterized differently than the structural code that identifies buildings as "essential" and "non-essential." The structural code uses different language and criteria and therefore have completely different meanings than the buildings identified in this addendum.

Table AA-5 Critical and Essential Facilities

Facility Name	Address	
Government		
<i>See Table AA-6 for information on seismic vulnerability.</i>		
City Hall/Court/Community Center	109 Maddox Ave	Critical
Public Works	104 E. Third St	Critical
Water Treatment Plant (ca. 1969)	19599 SW Briedwell Rd	Essential
Wastewater Treatment Plant (ca. 1961)	401 East 3 rd Street	Essential
US Post Office	105 Woodson Ave	Essential
Emergency Response		
Fire Station (Amity Fire District)	700 S Trade St	Critical
Police (City Hall)	109 Maddox Ave	Critical
Educational (Public)		
Amity School District Offices	807 S Trade St	Essential
Elementary School	300 Rice Ln	Essential
Middle School	115 Church Ave	Essential
High School	503 Oak St	Essential
Community Facilities		
Public Library	307 S Trade St.	Essential

Transportation/Infrastructure

Mobility plays an important role in Amity, and the daily experience of its residents, and businesses. Motor vehicles represent the dominant mode of travel through, and within

Amity. Amity is served by Yamhill County Transit (route 11 connects Amity to Salem and McMinnville).

Infrastructure that provides critical and essential services include:

Railroads

Railroads are major providers of regional and national cargo and trade flows. Railroads run through the Northern Willamette region provide vital transportation links from the Pacific to the rest of the country. The Portland & Western (PNWR) runs daily freight service through the city, but no longer serves Amity. The tracks are located west of OR 99W. There is no passenger rail service in the city.

Rails are sensitive to icing from the winter storms that can occur in the Northern Willamette region. For industries in the region that utilize rail transport, these disruptions in service can result in economic losses. The potential for rail accidents caused by natural hazards can also have serious implications for the local communities if hazardous materials are involved.

Airports

The city has no commercial service airports, however Portland International Airport (PDX), the largest and busiest airport in the state, is in nearby Multnomah County. PDX is the closest airport with commercial service, while the closest municipal airport is in McMinnville.

Roads/Seismic lifelines

Oregon 99W is the major transportation route through the city. OR 153 (5th St west of OR 99W and Nursery St east of OR 99W) is the only other major transit route in the city (see Figure AA-2).

Seismic lifeline routes help maintain transportation facilities for public safety and resilience in the case of natural disasters. Following a major earthquake, it is important for response and recovery agencies to know which roadways are most prepared for a major seismic event. The Oregon Department of Transportation has identified lifeline routes to provide a secure lifeline network of streets, highways, and bridges to facilitate emergency services response after a disaster.⁸

System connectivity and key geographical features were used to identify a three-tiered seismic lifeline system. Routes identified as Tier 1 are considered the most significant and necessary to ensure a functioning statewide transportation network. The Tier 2 system provides additional connectivity to the Tier 1 system, it allows for direct access to more locations and increased traffic volume capacity. The Tier 3 lifeline routes provide additional connectivity to the systems provided by Tiers 1 and 2.

The Lifeline Routes in Amity:

- Tier I: 99W
- Tier II: None
- Tier III: None

⁸ Oregon Department of Transportation. Oregon Seismic Lifeline Evaluation Vulnerability Synthese Identification, *Oregon Seismic Lifeline Routes*, May 15 2012. Page 6-4 figure 6-1. Accessed September 12, 2019.

Bridges

Because of earthquake risk, the seismic vulnerability of the county's bridges is an important issue. Non-functional bridges can disrupt emergency operations, sever lifelines, and disrupt local and freight traffic. These disruptions may exacerbate local economic losses if industries are unable to transport goods. Bridges within the city that are critical or essential include:

- Ash Swale, Hwy 91 (MP 44.89, ODOT 00416A)
- Salt Creek/Ash Swale Hwy 153 (ODOT 05041) – Structurally deficient

Utility Lifelines

Utility lifelines are the resources that the public relies on daily such as, electricity, fuel and communication lines. If these lines fail or are disrupted, the essential functions of the community can become severely impaired. Utility lifelines are closely related to physical infrastructures, like dams and power plants, as they transmit the power generated from these facilities.

Generally, the network of electricity transmission lines running throughout the city is operated by Portland General Electric.⁹ The Williams Gas Pipeline provides natural gas that is delivered to customers in the city by Northwest Natural Gas. These lines may be vulnerable as infrequent natural hazards, like earthquakes, could disrupt service to natural gas consumers across the region.

The city water and wastewater systems include the following:

- Water Reservoirs (SW Amity Vineyards Rd)
- Pump station (located throughout the city)
- Sewer treatment plant/lagoons (401 East 3rd Street)
- Water treatment plant (South Yamhill River, 19599 SW Briedwell Rd)

Environmental Assets/Parks:

Environmental assets are those parks, green spaces, wetlands, and rivers that provide an aesthetic, and functional ecosystem services for the community include: Amity City Park, Ash Swale, and Salt Creek.

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:

Child Care Facilities

None

Adult Care Facilities

None

⁹ Allan, Stuart et. al., Atlas of Oregon. Pg. 102.

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 Amity 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. The City of Amity has a Historic Landmarks Committee (Ord. No. 638, 2014). The Committee is responsible for protection of Amity's historic resources including the Amity Public Library.

Hazard Characteristics

Drought

The steering committee determined that the City's probability for drought is **high**, and that their vulnerability to drought is **moderate**.

Volume I, Section 2 describes the characteristics of drought hazards, history, as well as the location, extent, and probability of a potential event. Due to the climate of Yamhill County, past, and present weather conditions have shown an increasing potential for drought.

The City of Amity draws water from the South Yamhill River that support 100% of the water supply for the City.

The city has three water reservoirs located on SE Amity Vineyards Road. Two of these reservoir tanks hold 475,000 gallons. The City has another reservoir with a capacity of 600,000 gallons that is currently not operational but is expected to be back in use by the end of 2020. With all three reservoirs in operation the City will have a storage capacity of over 1,000,000 gallons. The existing capacity allows for an average of 128 average annual gallons per minute (AAGM) that is projected to increase to 168 by 2022.

Water is transferred from the South Yamhill River to the City via a 6-inch diameter water main via easements across private property and along Hwy 153 to the water treatment plant(WTP) located at 19599 SW Biedwell Rd and then via a transmission line running along Hwy 153 to the City.

The City has adequate capacity for existing needs, however, expects to need additional storage and capacity to meet population growth by the year 2025. The City has existing projects to restore (name) reservoir, update their water filtration system, and relocate the city's water intake to a location further up the South Yamhill River (see action items) to address these know deficiencies.

Vulnerability Assessment

Due to insufficient data and resources, Amity is currently unable to perform a quantitative risk assessment, or exposure analysis, for this hazard. State-wide 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 apply to humans and resources. Industries important to the City of Amity's local economy such as agriculture, fishing, and timber have historically been affected, and any future droughts would have tangible economic and potentially human impacts.

The city's water mains are vulnerable to seismic activity.

Mitigation Activities

The City provides information on water conservation through social media and their website. The City engages in other water conservation measures including water line leak detection and repair, replacement of deteriorating pipe, and replacement/repair of older and under-registering water meters and reducing dead end lines in order to increase water circulation throughout the system.

Amity Codes Pertaining to Droughts

The following Amity codes, plans, and policies pertain to droughts:

1. Amity Comprehensive Plan, "Water Resources" and "Land and Natural Hazards".
2. Amity provides water conservation tips to residents that include voluntary measures individuals and households can take to increase conservation of water during times of low water availability.

Please review Volume I, Section 2 for additional information on this hazard.

Earthquake (Cascadia Subduction Zone)

The steering committee determined that the City's probability for a Cascadia Subduction Zone (CSZ) earthquake is **moderate** and that their vulnerability to a CSZ earthquake is **high**.

Volume I, Section 2 describes the characteristics of earthquake hazards, history, as well as the location, extent, and probability of a potential event. Generally, an event that affects the County is likely to affect Amity as well. The causes, and characteristics of an earthquake event are appropriately described within the 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 Amity as well.

Within the Northern Willamette Valley are that includes Yamhill County, two potential faults and/or zones can generate high-magnitude earthquakes. These include the Cascadia Subduction Zone and the Gales Creek-Newberg-Mt. Angel Structural Zone (including the Newberg Fault).

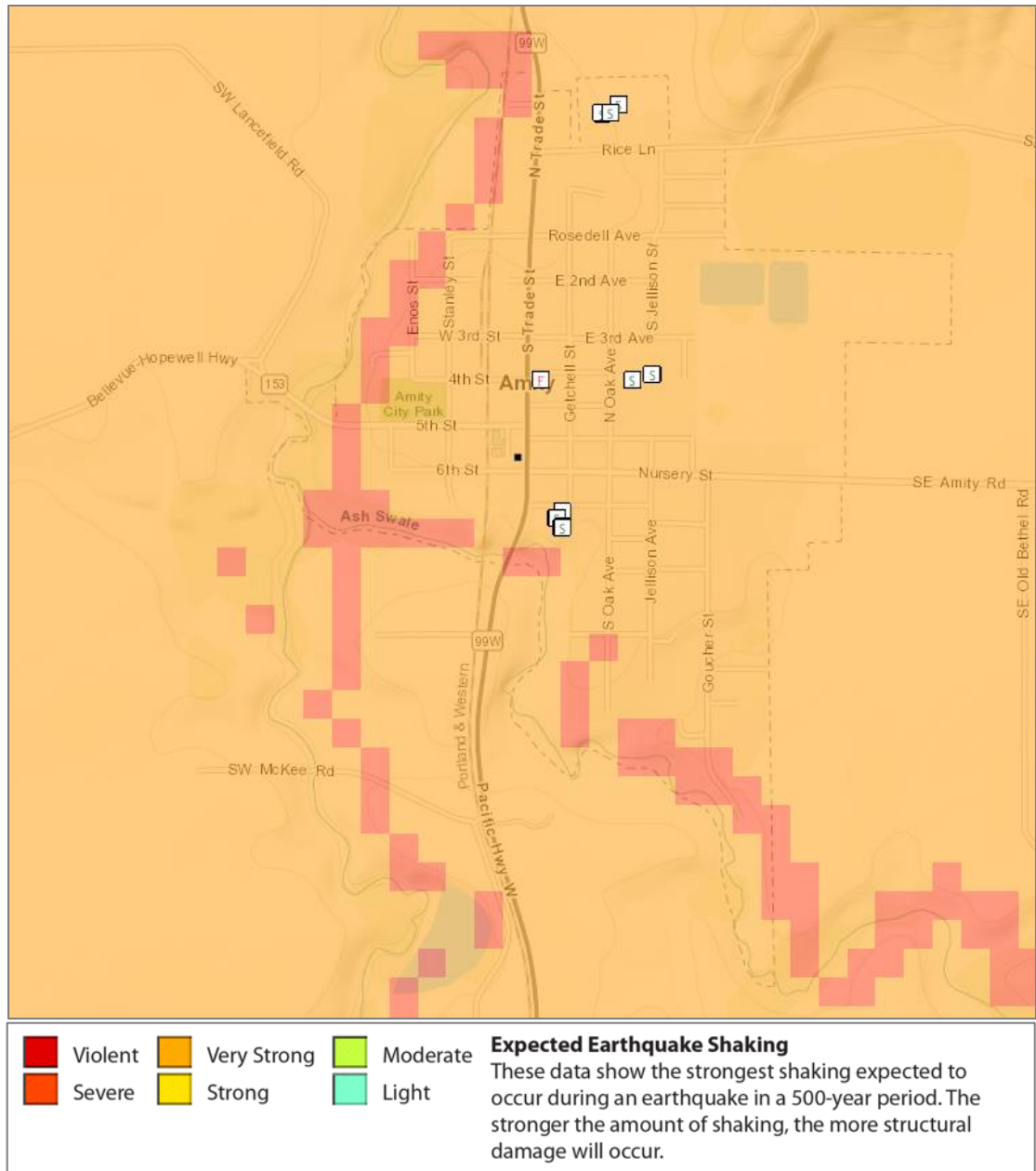
Cascadia Subduction Zone

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 approximately 1700 A.D.¹⁰

¹⁰ The Cascadia Region Earthquake Workgroup, 2005. Cascadia Subduction Zone Earthquakes: A magnitude 9.0 earthquake scenario. <http://www.crew.org/PDFs/CREWSubductionZoneSmall.pdf>

Figure AA-3 displays relative shaking hazards from a Cascadia Subduction Zone earthquake event. As shown in the figure, most of the City is expected to experience very strong (orange) to severe (red) shaking in a CSZ event.

Figure AA-3 Cascadia Subduction Zone Expected Shaking



Source: [Oregon HazVu: Statewide Geohazards Viewer \(DOGAMI\)](#)

Note: To view detail click the link above to access Oregon HazVu.

The city'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 City 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 Amity within the "Valley Zone" (Valley Zone, from the summit of the Coast Range to the summit of the Cascades). Within the Northwest Oregon region, 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.

Earthquake (Crustal)

The steering committee determined that the City's probability for a crustal earthquake is **low** and that their vulnerability to crustal earthquake is **moderate**.

Volume I, Section 2 describes the characteristics of earthquake hazards, history (see below), as well as the location, extent, and probability of a potential event. Generally, an event that affects the County is likely to affect Amity 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 Amity as well.

Figure AA-4 shows a generalized map of the Amity area that includes the areas for potential regional active faults, earthquake history (1971-2008), and soft soils (liquefaction) hazard. The figure shows the areas of greatest concern within the City limits as red (High liquefaction hazard). The inset map shows the county including the Newberg Fault and hazard history.

Vulnerability Assessment (subduction zone and crustal)

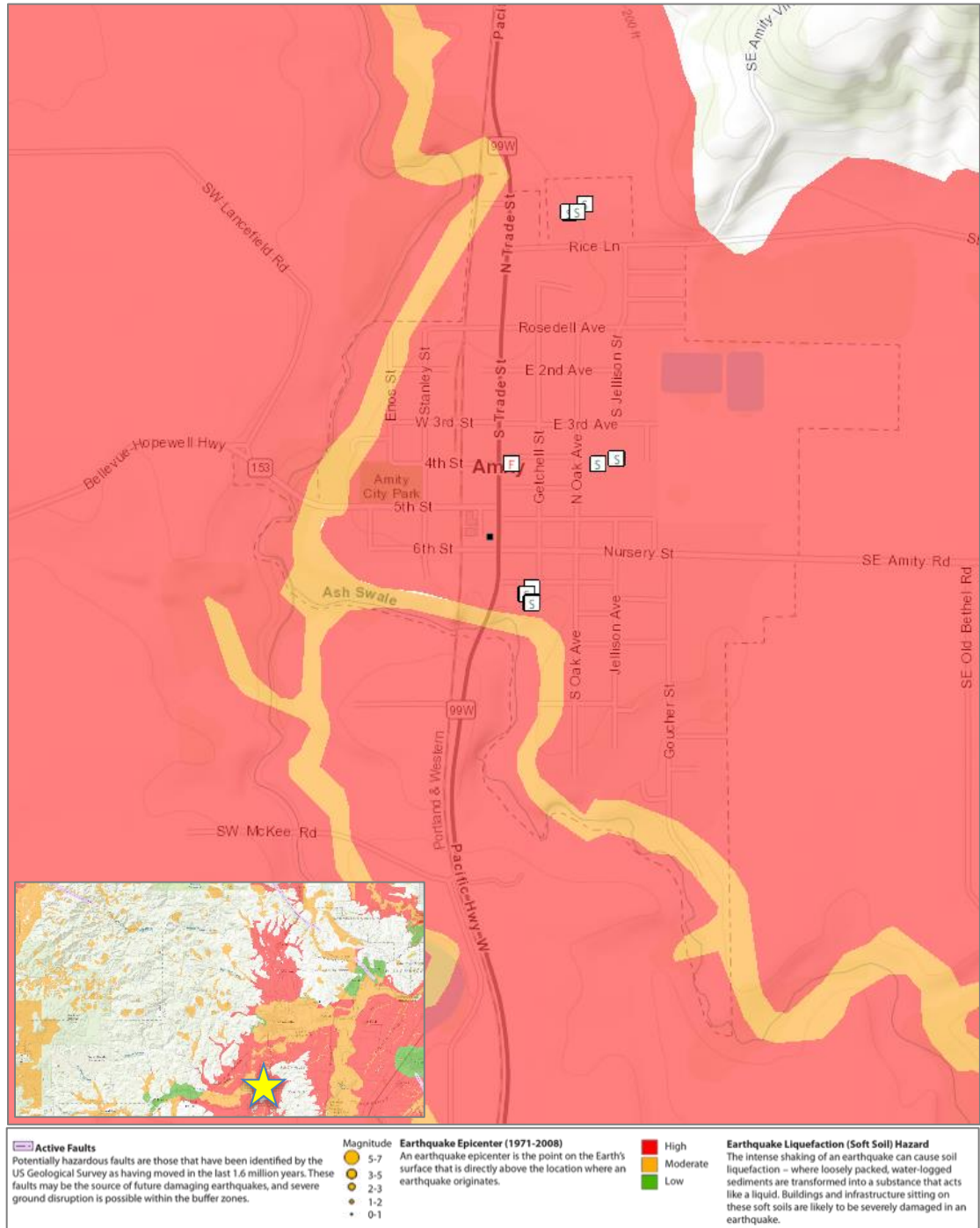
Due to insufficient data and resources, Amity is currently unable to perform a quantitative risk assessment for this hazard.

The western portion of Yamhill County is likely to experience higher levels of shaking than the eastern portion, as a result of its proximity to the Cascadia Subduction Zone.

The City of Amity is in the southern portion of Yamhill County, in a region likely to experience strong shaking should a subduction zone or significant crustal earthquake occur. This rating represents the peak acceleration of the ground caused by the earthquake, and for a strong designation corresponds to 9-20 percent of the acceleration of gravity. The City is also in an area prone to liquefaction (soft soils) during either a subductions zone or crustal earthquake event. Amity is located more distant from crustal earthquake faults (the closest is the Newberg fault approximately 17 miles to the northeast) and has not experienced a damaging earthquake.

Ground movement is likely to cause damage to weak, unreinforced masonry buildings, and to induce small landslides along unstable slopes. As well as landslide, earthquakes can trigger other hazards such as dam failure and disruption of transportation and utility systems.

Figure AA-4 Active Crustal Faults, Epicenters (1971-2008), and Soft Soils



Source: [Oregon HazVu: Statewide Geohazards Viewer \(DOGAMI\)](#)

Note: To view detail click the link above to access Oregon HazVu.

Utility systems will be significantly damaged, including damaged buildings, and damage to utility infrastructure, including water 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. 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.

Building codes were implemented in Oregon in the 1970s, however, stricter standards did not take effect until 1991 and early 2000s. As noted in the community characteristics section (Table AA-4), approximately 79% of residential buildings were built prior to 1990, which increases the City’s vulnerability to the earthquake hazard. Information on specific public buildings’ (schools and public safety) estimated seismic resistance, determined by DOGAMI in 2007, is shown in Table AA-6; each “X” represents one building within that ranking category. Of the facilities evaluated by DOGAMI using their Rapid Visual Survey (RVS), two buildings at Amity Middle School have a very high (100% chance) collapse potential, three buildings, one at Amity Middle School and two at Amity High School, have a high (greater than 10% chance) collapse potential.

Table AA-6 Rapid Visual Survey Scores

Facility	Site ID*	Level of Collapse Potential			
		Low (<1%)	Moderate (>1%)	High (>10%)	Very High (100%)
Schools					
Amity Elementary (300 Rice Ln)	Yamh_sch24		X,X,X		
Amity Middle (115 Church St)	Yamh_sch32			X	X,X
Amity High (503 Oak Ave)	Yamh_sch34			X,X	
Public Safety					
Amity Police and Fire (401 Trade St)	Yamh_fir01		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 Yamhill County Map](#)

Mitigation Activities

Earthquake mitigation activities listed here include current mitigation programs and activities that are being implemented by Amity agencies or organizations.

A primary mitigation objective is to construct or upgrade critical and essential facilities and infrastructure to withstand future earthquake events. Seismic retrofit grant awards per the [Seismic Rehabilitation Grant Program](#)¹¹ are available via the Oregon Infrastructure Finance Authority.

Amity Codes Pertaining to Earthquakes

The following Amity codes, plans, and policies pertain to earthquakes:

¹¹ 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.

1. Amity Comprehensive Plan, “Land and Natural Hazards” goal is: “To provide protection of life and property from natural hazards and disasters.”
2. The City of Amity enforces the [Oregon Building Code](#) which includes provisions for earthquakes.

Please review Volume I, Section 2 for additional information on this hazard.

Flood

The steering committee determined that the City’s probability for flood is **high** and that their vulnerability to flood is **high**.

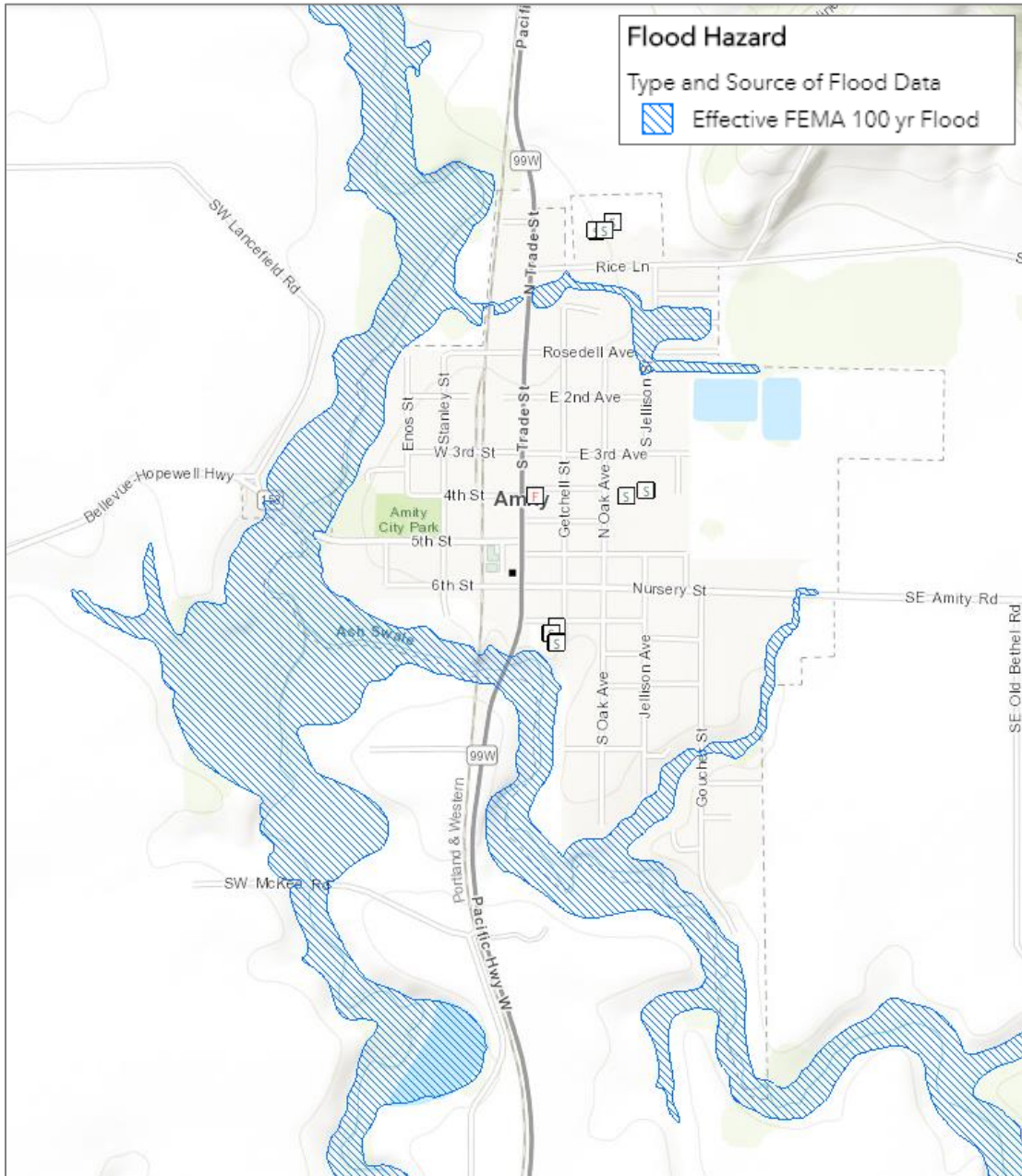
Volume I, Section 2 describes the characteristics of flood hazards, history, as well as the location, extent, and probability of a potential event. Portions of Amity have areas of floodplains (special flood hazard areas, SFHA). These include areas include along Salt Creek, which forms the western City limits, and Ash Swale, which forms the southern City limits (Figure AA-5).

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 Amity 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.

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. Business owners, and their employees are significantly impacted by flood events. Direct damages from flooding are the most common impacts, but indirect damages, such as diminished clientele, can be just as debilitating to a business.

Figure AA-5 Special Flood Hazard Area



Source: [Oregon HazVu: Statewide Geohazards Viewer \(DOGAMI\)](#)

Note: To view detail click the link above to access Oregon HazVu.

Vulnerability Assessment

Due to insufficient data and resources, Amity is currently unable to perform a quantitative risk assessment for this hazard. FEMA FIRMs were used to outline the 100-year and 500-year floodplains for the City of Amity. The 100-year floodplain delineates an area of high risk, while the 500-year floodplain delineates an area of moderate risk. The majority of special flood hazard areas are within agricultural or open space use. Commercial development is generally located in the center of Amity and is outside the special flood hazard area. A small residential area upstream of Ash Swale and a mobile home development along a tributary to Salt Creek are in the special flood hazard area.

National Flood Insurance Program (NFIP)

FEMA's Flood Insurance Study (FIS), and Flood Insurance Rate Maps (FIRMs) are effective as of March 2, 2010. Table AA-7 shows that as of August 2019, Amity has 13 National Flood Insurance Program (NFIP) policies in force. Of those, two (2) are for properties that were constructed before the initial FIRMs. The last Community Assistance Visit (CAV) for Amity was on December 29th, 1993. Amity does not participate in the Community Rating System (CRS). The table shows that all flood insurance policies are for residential structures, all single-family homes. There have been no paid flood insurance claims. The City complies with the NFIP through enforcement of their flood damage prevention ordinance and their floodplain management program.

Table AA-7 Flood Insurance Detail

	Yamhill County	Amity
Effective FIRM and FIS	3/2/2010	3/2/2010
Initial FIRM Date	-	12/1/1981
Total Policies	446	13
Pre-FIRM Policies	153	2
Policies by Building Type		
Single Family	401	13
2 to 4 Family	14	0
Other Residential	10	0
Non-Residential	21	0
Minus Rated A Zone	72	0
Insurance in Force	\$100,617,300	\$3,097,300
Total Paid Claims	81	0
Pre-FIRM Claims Paid	68	0
Substantial Damage Claims	3	0
Total Paid Amount	\$1,166,076	\$0
Repetitive Loss Structures	4	0
Severe Repetitive Loss Properties	1	0
CRS Class Rating	-	NP
Last Community Assistance Visit	-	12/29/1993

Source: Department of Land Conservation and Development, August 2019. Repetitive Flood Loss information provided by FEMA correspondence on September 10, 2020. NP = Not Participating

The Community Repetitive Loss record for Amity identifies no Repetitive Loss Properties¹² or Severe Repetitive Loss Properties¹³.

¹² 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.

¹³ 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.

Mitigation Activities

Flood mitigation activities listed here include current mitigation programs and activities that are being implemented by Amity agencies or organizations.

Amity Codes Pertaining to Flooding

The following Amity codes, plans, and policies pertain to flooding:

1. Amity Comprehensive Plan, Goal 7 - Areas Subject to Natural Disasters and Hazards, goal is: "To protect life and property from flooding and other natural hazards."
2. Amity Development Code section 2.111 *Floodplain Management*. This portion of the Community Development Code implements the Goal 7 policies of the Comprehensive Plan and regulates development within the floodplain.

Please review Volume I, Section 2 for additional information on this hazard.

Landslide

The steering committee determined that the City's probability for landslide is **low** and that their vulnerability to landslide is **low**.

Volume I, Section 2 describes the characteristics of landslide hazards, history, as well as the location, extent, and probability of a potential event within the region.

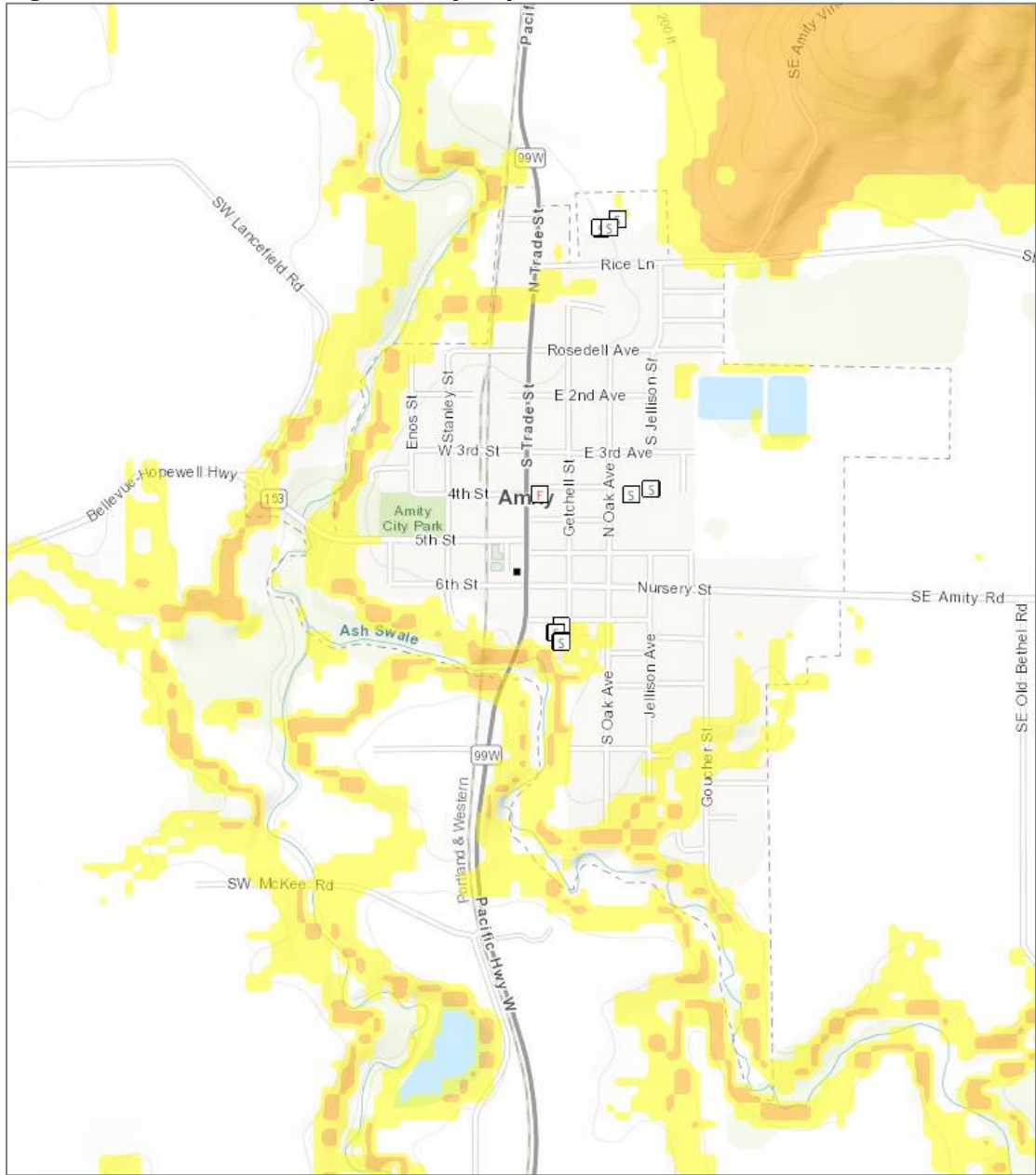
Landslide susceptibility exposure for Amity is shown in Figure AA-6. Approximately 4% of Amity has very high or high, and approximately 15% moderate, landslide susceptibility exposure.¹⁴ Within the City areas of higher landslide risk tend to be located adjacent to Ash Swale and Salt Creek and indicate erosion potential. In general, the areas of greater risk are located outside of the city to the northeast. *Note that even if a jurisdiction has a high percentage of area in a high or very high landslide exposure susceptibility zone, this does not mean there is a high risk, because risk is the intersection of hazard, and assets.*

Potential landslide-related impacts are adequately described within Volume I, Section 2, and include infrastructure 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 occur during any winter, and thoroughfares beyond City limits are susceptible to obstruction as well.

The most common type of landslides 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.

¹⁴ DOGAMI. [Open-File Report, O-16-02](#), *Landslide Susceptibility Overview Map of Oregon* (2016)

Figure AA-6 Landslide Susceptibility Exposure



Low	Landsliding unlikely. Areas classified as Landslide Density = Low (less than 7%) and areas classified as Slopes Prone to Landsliding = Low.
Moderate	Landsliding possible. Areas classified as Landslide Density = Low to Moderate (less than 17%) and areas classified as Slopes Prone to Landsliding = Moderate OR areas classified as Landslide Density = Moderate (7%-17%) and areas classified as Slopes Prone to Landsliding = Low.
High	Landsliding likely. Areas classified as Landslide Density = High (greater than 17%) and areas classified as Slopes Prone to Landsliding = Low and Moderate OR areas classified as Landslide Density = Low and Moderate (less than 17%) and areas classified as Slopes Prone to Landsliding = High.
Very High	Existing landslides Landslide Density and Slopes Prone to Landsliding data were not considered in this category. Note: the quality of landslide inventory (existing landslides) mapping varies across the state.

Source: [Oregon HazVu: Statewide Geohazards Viewer \(DOGAMI\)](#)

Note: To view detail click the link above to access Oregon HazVu

Vulnerability Assessment

Due to insufficient data and resources, Amity is currently unable to perform a quantitative risk assessment for this hazard. DOGAMI completed a statewide landslide susceptibility assessment in 2016 ([O-16-02](#)), general findings from that report are provided above and within Figure AA-6. Response and recovery efforts will likely vary from minor cleanup to more extensive utility system rebuilding. Utility disruptions are usually local and terrain dependent. Damages may require reestablishing electrical, communication, and gas pipeline connections occurring from specific breakage points. Initial debris clearing from emergency routes and high traffic areas may be required. Water and wastewater utilities may need treatment to quickly improve water quality by reducing excessive water turbidity and reestablishing waste disposal capability.

Mitigation Activities

Landslide mitigation activities listed here include current mitigation programs and activities that are being implemented by the City of Amity agencies or organizations.

City of Amity Codes Pertaining to Landslides

The following Amity codes, plans, and policies pertain to landslides:

1. Amity Comprehensive Plan, “Land and Natural Hazards” goal is: “To provide protection of life and property from natural hazards and disasters.”
2. The City of Amity enforces the [Oregon Building Code](#) which includes provisions that address the potential of geologic hazards including landslides.

Please review Volume I, Section 2 for additional information on this hazard.

Severe Weather

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

Windstorm

The steering committee determined that the City’s probability for windstorm is **high** and that their vulnerability to windstorm is **moderate**.

Volume I, Section 2 describes the characteristics of windstorm hazards, history, 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 flooding and winter storms (ice, freezing rain, and very rarely, snow). Other severe weather events that may accompany windstorms, including thunderstorms, hail, lightning strikes, and tornadoes are generally negligible for Amity.

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.

Damage from high winds generally has resulted in downed utility lines, and trees usually limited to several localized areas. 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 may cause localized urban flooding.

Please review Volume I, Section 2 for additional information on this hazard.

Winter Storm (Snow/Ice)

The steering committee determined that the City's probability for winter storm is **high** and that their vulnerability to winter storm is **high**.

Volume I, Section 2 describes the characteristics of winter storm hazards, history, 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.

Vulnerability Assessment

Due to insufficient data and resources, Amity is currently unable to perform a quantitative risk assessment, or exposure analysis, for the windstorm and winter storm hazards. All areas within the City of Amity are equally at risk of a windstorm or winter storm event.

Mitigation Activities

The City works to mitigate problems regarding windstorm and winter storm issues when they arise. Mitigation activities listed here include current mitigation programs and activities that are being implemented by Amity agencies or organizations.

- ODOT is responsible for sanding and de-icing state managed roads including: OR 99W within city limits.
- The City requires that all new utility lines, cables or wires, on new development be placed underground.
- The City via Yamhill County provides education on winter weather preparedness
- The City encourages property owners to trim hazard trees, and to maintain trees within public rights-of-way. Utility companies maintain trees along their utility easements.

City of Amity Codes Pertaining to Windstorms and Winter Storms

The following Amity codes, plans, and policies pertain to windstorms and winter storms:

1. The City of Amity Development Code provides standards for public infrastructure and utilities, including design.
2. The City of Amity enforces the [Oregon Building Code](#) which regulates building material requirements and includes provisions for windstorms and winter storms.

Please review Volume I, Section 2 for additional information on this hazard.

Volcanic Event

The steering committee determined that the City's probability for a volcanic event is **low** and that their vulnerability to a volcanic event is **low**.

Volume I, Section 2 describes the characteristics of volcanic hazards, history, as well as the location, extent, and probability of a potential event within the region. Generally, an event that affects the Eastern portion of the County is likely to affect Amity as well. Several volcanoes are located near Amity, the closest of which are Mount Hood, Mount Adams, Mount Saint Helens, Mount Rainier, and the Three Sisters.

Due to Amity'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). Although the City of Amity is unlikely to experience lahars or lava flows, tephra (sand- sized or finer particles of volcanic rock that is ejected rapidly into the air from volcanic vents) drifts downwind from the explosions and can form a blanket-like deposit of ash. 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 heavier coating of ash. Tephra is a public health threat, and can damage agriculture and transportation systems (i.e., aircraft and on- the-ground vehicles). Tephra can also clog drainage systems and create major debris management problems. Within Amity, public health would be a primary concern, and keeping transportation routes open/accessible would be important as well.

Vulnerability Assessment

Due to insufficient data and resources, Amity is currently unable to perform a quantitative risk assessment, or exposure analysis, for this hazard.

Mitigation Activities

The existing volcanic event hazard mitigation activities are conducted at the county, regional, state, and federal levels and are described in the Yamhill County NHMP.

City of Amity Codes Pertaining to Volcanic Events

The City does not have specific codes, plans, or policies that pertain to volcanic events:

Please review Volume I, Section 2 for additional information on this hazard.

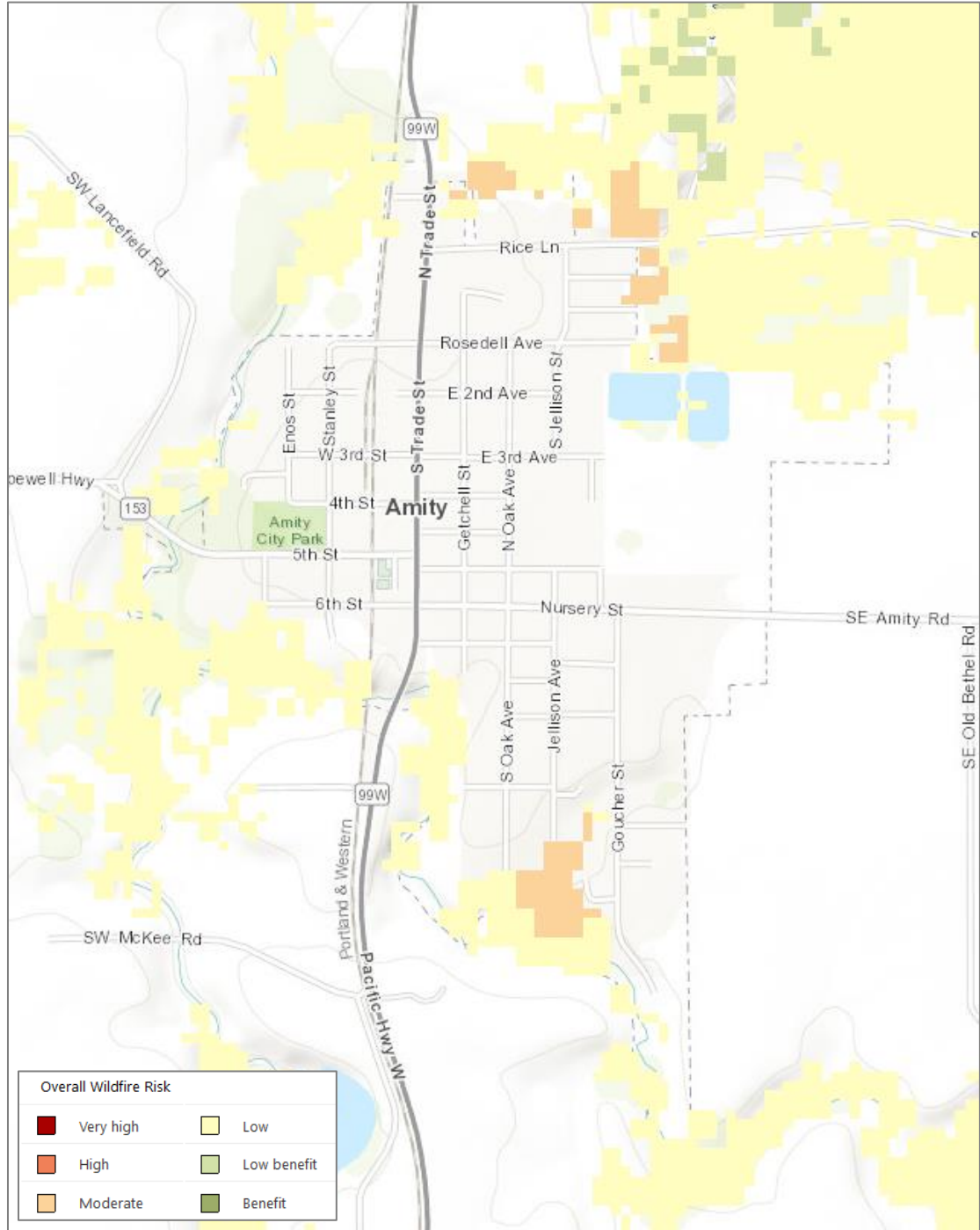
Wildfire

The steering committee determined that the City's probability for wildfire is **low** and that their vulnerability to wildfire is **low**.

The [Yamhill County Community Wildfire Protection Plan \(CWPP\)](#) was completed in August 2009 and revised in 2015. The CWPP is hereby incorporated into this NHMP addendum by reference, and it will serve as the wildfire section for this addendum.

Volume I, Section 2 describes the characteristics of wildland fire hazards, history, as well as the location, extent, and probability of a potential event within the region. The location, and extent of a wildland fire vary depending on fuel, topography, and weather conditions. Weather, and urbanization conditions are primarily at cause for the hazard level. Amity has not experienced a wildfire within City limits. The city is surrounded by irrigated agricultural land. However, some wooded areas are a concern in the case of a wildfire event. Figure AA-7 shows overall wildfire risk in Amity. The wildfire risk within Amity is low with some pockets of moderate risk in the northeast and south

Figure AA-7 Overall Wildfire Risk



Source: [Oregon Wildfire Risk Explorer](https://www.oregon.gov/DES/Divisions/Planning/Reports/2019-2020%20Wildfire%20Risk%20Assessment.pdf), date accessed April 22, 2020.

The forested areas within, and surrounding Amity are interface areas. These areas (outside of the city) are characterized by varying housing structures (often large houses on small lots, some with shake roofs), natural, and ornamental vegetation, and topography that may increase the risk for wildfire spreading (particularly to the north and northeast).

Most of the city has less severe (low to none) wildfire burn probability that includes expected flame lengths less than four feet under normal weather conditions.¹⁵ However, conditions vary widely and with local topography, fuels, and local weather (including wind) conditions. Under warm, dry, windy, and drought conditions expect higher likelihood of fire starts, higher intensity, more ember activity, and a more difficult to control wildfire that will include more fire effects and impacts.

Amity's fire response is provided by Amity Fire District. The CWPP assesses wildfire risk, maps wildland urban interface areas, and includes actions to mitigate wildfire risk (all identified actions are outside the city limits). The City will update the City's wildfire risk assessment if the CWPP presents better data during future updates (an action item is included to participate in future updates to the CWPP).

Vulnerability Assessment

Due to insufficient data and resources, Amity is currently unable to perform a quantitative risk assessment for this hazard.

The potential community impacts, and vulnerabilities described in Volume I, Section 2 are generally accurate for the City as well.

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).

Exposed infrastructure including wastewater main lines, major water lines, natural gas pipeline and fiber optic lines are buried, decreasing their vulnerability to damage from wildfire hazards. However, wildfire conditions could potentially limit or delay access for the purposes of operation or repair.

Mitigation Activities

The Amity Fire District works to mitigate problems regarding wildfire issues when they arise. Wildfire mitigation activities listed here include current mitigation programs and activities that are being implemented by Amity agencies or organizations.

City of Amity Codes Pertaining to Wildfires

The following Amity codes, plans, and policies pertain to wildfires:

1. The City of Amity Development Code provides standards for public infrastructure and utilities, including design.
2. The City of Amity enforces the [Oregon Building Code](#) which regulates building material requirements and includes provisions for fire.

Please review the [Yamhill County Community Wildfire Protection Plan \(CWPP\)](#) and Volume I, Section 2 for additional information on this hazard.

¹⁵ [Oregon Wildfire Risk Explorer](#),

ATTACHMENT A: ACTION ITEM FORMS

In the previous plan the city identified two high priority action items. These actions are those the city considered during the 2015-2020 Implementation and Maintenance period and they are listed in Table AA-8 along with their status.

Table AA-8 2015 High Priority Action Item Status

2014 Priority Action ID	Status (2020 Action ID) (Complete, Deferred, Deleted, Ongoing)	Comment	Description
Action #1	Deferred (Earthquake #1)	Lack of funding and capacity	Retrofit important public facilities with significant seismic vulnerabilities
Action #2	Deferred (Earthquake #1)	Lack of funding and capacity	Retrofit bridges that are not seismically adequate

Table AA-1 provides a summary list of 2020 NHMP Actions for the city. Each high priority action item has a corresponding action item worksheet describing the activity, identifying the rationale for the project, identifying potential ideas for implementation, and assigning coordinating and partner organizations. The action item worksheets can assist the community in pre-packaging potential projects for grant funding. The worksheet components are described below.

ALIGNMENT WITH EXISTING PLANS/POLICIES

The City NHMP includes a range of action items that, when implemented, will reduce loss from hazard events in the City. Within the plan, FEMA requires the identification of existing programs that might be used to implement these action items. The City addresses statewide planning goals and legislative requirements through its comprehensive land use plan, capital improvements plan, mandated standards and building codes. To the extent possible, the City will work to incorporate the recommended mitigation action items into existing programs and procedures. Each action item identifies related existing plans and policies.

STATUS/RATIONALE FOR PROPOSED ACTION ITEM

Action items should be fact-based and tied directly to issues or needs identified throughout the planning process. Action items can be developed at any time during the planning process and can come from several sources, including participants in the planning process, noted deficiencies in local capability, or issues identified through the risk assessment. The rationale for proposed action items is based on the information documented in this addendum and within Volume I, Section 2. The worksheet provides information on the activities that have occurred since the previous plan for each action item.

IDEAS FOR IMPLEMENTATION

The ideas for implementation offer a transition from theory to practice and serve as a starting point for this plan. This component of the action item is dynamic, since some ideas

may prove to not be feasible, and new ideas may be added during the plan maintenance process. Ideas for implementation include such things as collaboration with relevant organizations, grant programs, tax incentives, human resources, education and outreach, research, and physical manipulation of buildings and infrastructure.

COORDINATING (LEAD) ORGANIZATION:

The coordinating organization is the public agency with the regulatory responsibility to address natural hazards, or that is willing and able to organize resources, find appropriate funding, or oversee activity implementation, monitoring and evaluation.

INTERNAL AND EXTERNAL PARTNERS:

The internal and external partner organizations listed in the Action Item Worksheets are potential partners recommended by the project steering committee but not necessarily contacted during the development of the plan. The coordinating organization should contact the identified partner organizations to see if they are capable of and interested in participation. This initial contact is also to gain a commitment of time and/or resources toward completion of the action items.

Internal partner organizations are departments within the City or other participating jurisdiction that may be able to assist in the implementation of action items by providing relevant resources to the coordinating organization.

External partner organizations can assist the coordinating organization in implementing the action items in various functions and may include local, regional, state, or federal agencies, as well as local and regional public and private sector organizations.

PLAN GOALS ADDRESSED:

The plan goals addressed by each action item are identified as a means for monitoring and evaluating how well the mitigation plan is achieving its goals, following implementation.

TIMELINE:

All broad scale action items have been determined to be ongoing, as opposed to short (0 to 2 years), medium (2-5 years), or long (6 or more years). This is because the action items are broad ideas, and although actions may be implemented to address the broad ideas, the efforts should be ongoing.

POTENTIAL FUNDING SOURCE

Where possible potential funding sources have been identified. Example funding sources may include: Federal Hazard Mitigation Assistance programs, state funding sources such as the Oregon Seismic Rehabilitation Grant Program, or local funding sources such as capital improvement or general funds. An action item may include several potential funding sources.

ESTIMATED COST

A rough estimate of the cost for implementing each action item is included. Costs are shown in general categories showing low, medium, or high cost. The estimated cost for each category is outlined below:

Low - Less than \$50,000

Medium - \$50,000 – \$100,000

High - More than \$100,000

Multi-Hazard #2

Proposed Action Item:		Alignment with Plan Goals:	
Cross reference and incorporate mitigation planning provisions into all community planning processes such as comprehensive, capital improvement, land use, transportation plans, etc. to demonstrate multi-benefit considerations and facilitate using multiple funding source consideration.		Goal 1, Goal 4, Goal 5, Goal 6, Goal 7, Goal 8	
Alignment with Existing Plans/Policies:			
Comprehensive Plan, Development Code, Building Code			
2020 Status/Rationale for Proposed Action Item:			
<p>Comprehensive plans provide the framework for the physical design of a community. They shape overall growth and development while addressing economic, environmental and social issues. Oregon's statewide goals are accomplished through local comprehensive plans. State Law requires local governments to adopt a comprehensive plan and the zoning and land-division ordinances needed to put the plan into action.</p> <p>Integration of NHMPs into comprehensive plans and other plans will help to reduce a community's vulnerability to natural hazards, support in mitigation activities, help to increase the speed in which action items are implemented and therefore the speed in which communities recover from natural disasters.</p> <p>Integration of NHMPs into local plans gives the action items identified in the NHMP legal status for guiding local decision-making regarding land use and/ or capital expenditures. .</p>			
Ideas for Implementation:			
<p>Conduct a policy crosswalk of the NHMP, the comprehensive plan, and other planning documents, to identify areas of possible integration.</p> <p>Integrate natural hazards information and policies into the comprehensive plan and other plans.</p> <p>Engage in collaborative planning and integration.</p> <p>Coordinate future NHMP and comprehensive plan reviews and updates.</p>			
Coordinating Organization:		Planning	
Internal Partners:		External Partners:	
Public Works, Administration		DLCD	
Potential Funding Sources:		Estimated cost:	Timeline:
General fund, utility rates		Medium	<input type="checkbox"/> Short (0-2 years) <input checked="" type="checkbox"/> Medium (2-5 years) <input type="checkbox"/> Long (6+ years) <input type="checkbox"/> Ongoing
Form Submitted by:	2019-20 NHMP Steering Committee		
Priority:	High		

Drought #1

Proposed Action Item:		Alignment with Plan Goals:	
Complete water system improvements to ensure adequate storage and capacity.		Goal 3, Goal 4, Goal 6, Goal 8	
Alignment with Existing Plans/Policies:			
Water System Master Plan			
2020 Status/Rationale for Proposed Action Item:			
The Disaster Mitigation Act of 2000 requires communities to identify actions and projects that reduce the effects of hazards on the community [201.6(c)(3)(ii)]. Improving the water system will allow for the provision of adequate storage and capacity, thus decreasing risk to residents and visitors during a hazard event.			
Ideas for Implementation:			
Implement improvements identified in the water system master plan.			
Coordinating Organization:		Public Works	
Internal Partners:		External Partners:	
Administration			
Potential Funding Sources:		Estimated cost:	Timeline:
General fund, utility rates, grants		High	<input type="checkbox"/> Short (0-2 years) <input checked="" type="checkbox"/> Medium (2-5 years) <input type="checkbox"/> Long (6+ years) <input type="checkbox"/> Ongoing
Form Submitted by:	2019-20 NHMP Steering Committee		
Priority:	High		

Earthquake #1

Proposed Action Item:		Alignment with Plan Goals:	
Conduct seismic strength evaluations of critical facilities and infrastructure to identify vulnerabilities and seismically retrofit (structural and nonstructural) identified critical facilities and infrastructure to meet life safety standards in order to continue operations post-earthquake.		Goal 2, Goal 3, Goal 4, Goal 6, Goal 7, Goal 8	
Alignment with Existing Plans/Policies:			
2020 Status/Rationale for Proposed Action Item:			
Currently, all new facilities must comply with and meet seismic standards. If someone moves into an old building, they must upgrade to current standards. DOGAMI did a windshield survey of schools, fire stations, police, and city halls (2007 RVS). The focus was on action of existing buildings and information was shared with participants.			
Ideas for Implementation:			
Provide information to government building and school facility managers and teachers on nonstructural mitigation techniques including: securing bookcases, filing cabinets, light fixtures, and other objects that can cause injuries and block exits; Encourage facility managers, business owners, and teachers to refer to FEMA's practical guidebook: Reducing the Risks of Nonstructural Earthquake Damage; Encourage homeowners and renters to use Is Your Home Protected from Earthquake Disaster? A Homeowner's Guide to Earthquake Retrofit (IBHS) for economic and efficient mitigation techniques; Use the FEMA 154 seismic evaluations generated by DOGAMI to prioritize critical and essential buildings for upgrades; Explore partnerships to provide retrofitting classes for homeowners, renters, building professionals, and contractors; and Target development located in potential fault zones or in unstable soils for intensive education and retrofitting resources.			
Coordinating Organization:		Administration	
Internal Partners:		External Partners:	
Public Works, Planning (MWVCOG), City Engineer (Keller Associates)		DOGAMI	
Potential Funding Sources:		Estimated cost:	Timeline:
General funds, utility fees, grants (SRGP, HMA)		High	<input type="checkbox"/> Short (0-2 years) <input type="checkbox"/> Medium (2-5 years) <input checked="" type="checkbox"/> Long (6+ years) <input type="checkbox"/> Ongoing
Form Submitted by:	2019-20 NHMP Steering Committee		
Priority:	High		

Earthquake #3

Proposed Action Item:		Alignment with Plan Goals:	
Encourage utility companies to evaluate and harden vulnerable infrastructure elements.		Goal 2, Goal 3, Goal 4, Goal 6, Goal 7, Goal 8	
Alignment with Existing Plans/Policies:			
2020 Status/Rationale for Proposed Action Item:			
<p>Currently, all new facilities and infrastructure must comply with and meet seismic standards.</p> <p>The Disaster Mitigation Act of 2000 requires communities to identify actions and projects that reduce the effects of hazards on the community [201.6(c)(3)(ii)]. Evaluating and hardening vulnerable infrastructure will decrease service interruptions during and after a hazard event.</p>			
Ideas for Implementation:			
<p>Evaluate vulnerable utility systems and determine appropriate mitigation activities.</p> <p>Implement appropriate mitigation activities.</p> <p>Target utility infrastructure located in potential fault zones or in unstable soils.</p>			
Coordinating Organization:		Administration	
Internal Partners:		External Partners:	
Public Works, Planning (MWVCOG), City Engineer (Keller Associates)		DOGAMI	
Potential Funding Sources:		Estimated cost:	Timeline:
General funds, permit fees		Low (Potential high coast for utility companies)	<input type="checkbox"/> Short (0-2 years) <input type="checkbox"/> Medium (2-5 years) <input checked="" type="checkbox"/> Long (6+ years) <input type="checkbox"/> Ongoing
Form Submitted by:		2019-20 NHMP Steering Committee	
Priority:		High	

Flood #6

Proposed Action Item:		Alignment with Plan Goals:	
Relocate wastewater lift stations (2) outside of the 100-year floodplain		Goal 3, Goal 4, Goal 6, Goal 8	
Alignment with Existing Plans/Policies:			
Water System Master Plan			
2020 Status/Rationale for Proposed Action Item:			
The Disaster Mitigation Act of 2000 requires communities to identify actions and projects that reduce the effects of hazards on the community [201.6(c)(3)(ii)]. Relocating the lift stations outside of the floodplain will allow for continuous operation during a flood event and decrease interruptions during and after a hazard event.			
Ideas for Implementation:			
Implement improvements identified in the water system master plan.			
Coordinating Organization:		Public Works	
Internal Partners:		External Partners:	
City Engineer (Keller Associates), Administration			
Potential Funding Sources:		Estimated cost:	Timeline:
General funds, HMA		High	<input checked="" type="checkbox"/> Short (0-2 years) <input type="checkbox"/> Medium (2-5 years) <input type="checkbox"/> Long (6+ years) <input type="checkbox"/> Ongoing
Form Submitted by:	2019-20 NHMP Steering Committee		
Priority:	High		

Severe Weather #1

Proposed Action Item:		Alignment with Plan Goals:	
Develop, implement, and maintain partnership program with electrical utilities to use underground utility placement methods where possible to reduce or eliminate power outages from severe winter storms. Consider developing incentive programs. Develop and implement tree clearing mitigation programs to keep trees from threatening lives, property, and public infrastructure from severe weather events.		Goal 2, Goal 3, Goal 4, Goal 6, Goal 8	
Alignment with Existing Plans/Policies:			
2020 Status/Rationale for Proposed Action Item:			
Currently, all new facilities and infrastructure must comply with development standards including undergrounding. The Disaster Mitigation Act of 2000 requires communities to identify actions and projects that reduce the effects of hazards on the community [201.6(c)(3)(ii)]. Undergrounding electrical utility lines/infrastructure will decrease service interruptions during and after a hazard event.			
Ideas for Implementation:			
Develop, implement, and maintain partnership with electric utilities to underground existing utilities where and when possible. Consider possible incentives. Develop a tree clearing program to mitigate related threats to infrastructure, people, and property.			
Coordinating Organization:	Public Works		
Internal Partners:		External Partners:	
Community Development		Oregon Energy Trust, Pacific Power	
Potential Funding Sources:	Estimated cost:	Timeline:	
General funds, utility fees	Medium	<input type="checkbox"/> Short (0-2 years) <input type="checkbox"/> Medium (2-5 years) <input type="checkbox"/> Long (6+ years) <input checked="" type="checkbox"/> Ongoing	
Form Submitted by:	2019-20 NHMP Steering Committee		
Priority:	High		

Severe Weather #3

Proposed Action Item:		Alignment with Plan Goals:	
Purchase NOAA Weather radios and develop a web portal linking residents to various weather information sites. (NWS, FEMA, The Weather Channel). Develop early warning test program partnering with NOAA, City Police, Fire Departments, and Volunteer Fire Department to coordinate tests.		Goal 2, Goal 4, Goal 6, Goal 8	
Alignment with Existing Plans/Policies:			
2020 Status/Rationale for Proposed Action Item:			
Ideas for Implementation:			
Purchase NOAA weather radios Develop a webs portal that links residents to various weather information sites Develop and test an early warning test program.			
Coordinating Organization:		Administration	
Internal Partners:		External Partners:	
Yamhill Co. Emergency Management, Sheriff's Office, Amity Fire		NOAA	
Potential Funding Sources:		Estimated cost:	Timeline:
General fund, grants		Low	<input checked="" type="checkbox"/> Short (0-2 years) <input type="checkbox"/> Medium (2-5 years) <input type="checkbox"/> Long (6+ years) <input type="checkbox"/> Ongoing
Form Submitted by:	2019-20 NHMP Steering Committee		
Priority:	High		

Volcanic Event #1

Proposed Action Item:		Alignment with Plan Goals:	
Evaluate capability of water treatment plants to deal with high turbidity from ash falls, update emergency response plans, and upgrade treatment facilities' physical plant to deal with ash falls. Evaluate ash impact on storm water drainage system.		Goal 4, Goal 5, Goal 6, Goal 8	
Alignment with Existing Plans/Policies:			
Water System Master Plan, Emergency Operations Plan, Transportation System Plan			
2020 Status/Rationale for Proposed Action Item:			
The Disaster Mitigation Act of 2000 requires communities to identify actions and projects that reduce the effects of hazards on the community [201.6(c)(3)(ii)]. Ensuring that the water treatment plant, treatment facilities, and storm water drainage systems are mitigated for ashfall will decrease service interruptions during and after a hazard event.			
Ideas for Implementation:			
Evaluate capability of water treatment plant to deal with expected ashfall from a nearby volcanic event. Upgrade treatment facilities to deal with expected ashfall. Evaluate and upgrade storm water drainage system to mitigate expected ash fall from a nearby volcanic event.			
Coordinating Organization:		Public Works	
Internal Partners:		External Partners:	
Administration		USGS, Cascades Volcano Observatory	
Potential Funding Sources:		Estimated cost:	Timeline:
General fund, utility fees, grants		Low	<input type="checkbox"/> Short (0-2 years) <input type="checkbox"/> Medium (2-5 years) <input checked="" type="checkbox"/> Long (6+ years) <input type="checkbox"/> Ongoing
Form Submitted by:	2019-20 NHMP Steering Committee		
Priority:	High		

Wildfire #1

Proposed Action Item:		Alignment with Plan Goals:	
Coordinate wildfire mitigation action items through the Yamhill County Community Wildfire Protection Plan.		Goal 1, Goal 2, Goal 3, Goal 4, Goal 5, Goal 6, Goal 7, Goal 8	
Alignment with Existing Plans/Policies:			
Yamhill County Community Wildfire Protection Plan			
2020 Status/Rationale for Proposed Action Item:			
The wildfire mitigation action items provide direction on specific activities that organizations and residents in Amity/Yamhill County can take to reduce wildfire hazards.			
Ideas for Implementation:			
Implement high and medium priority projects including defensible space and fuels reduction projects identified in the CWPP.			
Coordinating Organization:		Amity Fire District	
Internal Partners:		External Partners:	
Administration		ODF	
Potential Funding Sources:		Estimated cost:	Timeline:
General fund, ODF grants		Medium	<input type="checkbox"/> Short (0-2 years) <input type="checkbox"/> Medium (2-5 years) <input type="checkbox"/> Long (6+ years) <input checked="" type="checkbox"/> Ongoing
Form Submitted by:	2019-20 NHMP Steering Committee		
Priority:	High		

Wildfire #3

Proposed Action Item:		Alignment with Plan Goals:	
Identify evacuation routes away from high hazard areas and develop outreach program to educate the public concerning warnings and evacuation procedures. Update list of critical facilities and vulnerable populations based on mapped high hazard areas.		Goal 2, Goal 3, Goal 4, Goal 5, Goal 6, Goal 7, Goal 8	
Alignment with Existing Plans/Policies:			
Yamhill County Community Wildfire Protection Plan, Transportation System Plan, Emergency Operations Plan			
2020 Status/Rationale for Proposed Action Item:			
The City of Amity has relatively low wildfire risk. However, there are areas of higher risk located in the north and south of the city. Identifying evacuation routes and developing an outreach program to educate the public about evacuation procedures will reduce risk to people during a hazard event.			
Ideas for Implementation:			
Identify evacuation routes. Update list of critical facilities and vulnerable populations based on higher hazard areas. Develop outreach program and educate the public concerning warnings and evacuation procedures.			
Coordinating Organization:	Amity Fire District		
Internal Partners:		External Partners:	
Administration, Yamhill Co. Emergency Management, Public Works		ODF	
Potential Funding Sources:		Estimated cost:	Timeline:
General fund, grants		Low	<input checked="" type="checkbox"/> Short (0-2 years) <input type="checkbox"/> Medium (2-5 years) <input type="checkbox"/> Long (6+ years) <input type="checkbox"/> Ongoing
Form Submitted by:	2019-20 NHMP Steering Committee		
Priority:	High		

ATTACHMENT B: PUBLIC INVOLVEMENT SUMMARY

Members of the steering committee provided edits and updates to the NHMP prior to the public review period as reflected in the final document.

To provide the public information regarding the draft NHMP addendum, and provide an opportunity for comment, an announcement (see text below) was announced on the city's website and an email contact was provided for public comment.

During the public review period there were no comments provided.



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City of Carlton Addendum to the Yamhill County Multi-Jurisdictional Hazard Mitigation Plan



Photo Credit Washington Post

Effective: December 22, 2020 through December 21, 2025



Prepared for:

City of Carlton

Prepared by:

University of Oregon
Institute for Policy Research and Engagement
Oregon Partnership for Disaster Resilience

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FEMA

January 20, 2021

The Honorable Casey Kulla
Chair Kulla, Yamhill County Board of Commissioners
535 NE 5th St.
McMinnville, Oregon 97128

Dear Chair Kulla:

On December 22, 2020, the U.S. Department of Homeland Security's Federal Emergency Management Agency (FEMA) Region 10, approved the Yamhill County Hazard Mitigation Plan as a multi-jurisdictional local plan as outlined in Code of Federal Regulations Title 44 Part 201. This approval provides the below jurisdictions eligibility to apply for the Robert T. Stafford Disaster Relief and Emergency Assistance Act's, Hazard Mitigation Assistance grants projects through December 21, 2025, through your state:

Yamhill County	City of Amity	City of Carlton	City of Dayton
City of McMinnville	City of Newberg	City of Sheridan	City of Yamhill

FEMA individually evaluates all application requests for funding according to the specific eligibility requirements of the applicable program. Though a specific mitigation activity or project identified in the plan may meet the eligibility requirements, it may not automatically receive approval for FEMA funding under any of the aforementioned programs.

Approved mitigation plans may be eligible for points under the National Flood Insurance Program's Community Rating System (CRS). For additional information regarding the CRS, please visit: www.fema.gov/national-flood-insurance-program-community-rating-system or contact your local floodplain manager. Over the next five years, we encourage your communities to follow the plan's schedule for monitoring and updating, and to develop further mitigation actions. To continue eligibility, jurisdictions must review, revise as appropriate, and resubmit the plan within five years of the original approval date.

If you have questions regarding your plan's approval or FEMA's mitigation grant programs, please contact Joseph Murray, Planner with Oregon Office of Emergency Management, at (503) 378-2911, who locally coordinates and administers these efforts.

Sincerely,

Kristen Meyers, Director
Mitigation Division

Enclosure

cc: Amie Bashant, Oregon Office of Emergency Management

EG:vl

Resolution # 2020-303

A Resolution Adopting the City of Carlton Representation in the Updates to the Yamhill County Multi-Jurisdictional Natural Hazards Mitigation Plan

Whereas, the City of Carlton recognizes the threat that natural hazards pose to people, property and infrastructure within our community; and

Whereas, undertaking hazard mitigation actions will reduce the potential for harm to people, property and infrastructure from future hazard occurrences; and

Whereas, an adopted Natural Hazards Mitigation Plan is required as a condition of future funding for mitigation projects under multiple FEMA pre- and post-disaster mitigation grant programs; and

Whereas, the City of Carlton has fully participated in the FEMA prescribed mitigation planning process to prepare the *Yamhill County, Multi-Jurisdictional Natural Hazard Mitigation Plan*, which has established a comprehensive, coordinated planning process to eliminate or minimize these vulnerabilities; and

Whereas, the City of Carlton has identified natural hazard risks and prioritized a number of proposed actions and programs needed to mitigate the vulnerabilities of the City of Carlton to the impacts of future disasters within the *Yamhill County, Multi-Jurisdictional Natural Hazard Mitigation Plan*; and

Whereas, these proposed projects and programs have been incorporated into the *Yamhill County, Multi-Jurisdictional Natural Hazard Mitigation Plan* that has been prepared and promulgated for consideration and implementation by the cities of Yamhill County; and

Whereas, the Oregon Office of Emergency Management and Federal Emergency Management Agency, Region X officials have reviewed the *City of Carlton addendum* to the *Yamhill County Multi-Jurisdictional Natural Hazard Mitigation Plan* and pre-approved it (dated, September 10, 2020) contingent upon this official adoption of the participating governments and entities;

Whereas, the NHMP is comprised of comprised of three volumes: Volume I: Basic Plan, Volume II: Jurisdictional Addenda, and Volume III: Appendices, collectively referred to herein as the NHMP; and

Whereas, the NHMP is in an on-going cycle of development and revision to improve its effectiveness; and

Whereas, City of Carlton adopts the NHMP and directs the City Manager to develop, approve, and implement the mitigation strategies and any administrative changes to the NHMP.

Now, therefore, be it resolved, that the City of Carlton adopts *the Yamhill County Multi-Jurisdictional Natural Hazards Mitigation Plan* as an official plan; and

Be it further resolved, that the City of Carlton will submit this Adoption Resolution to the Oregon Office of Emergency Management and Federal Emergency Management Agency, Region X officials to enable final approval of the *Yamhill County Multi-Jurisdictional Natural Hazards Mitigation Plan*.

Adopted this 6th day of October, 2020



Attest - City Recorder



Mayor

Purpose

This is an update of the Carlton addendum to the Yamhill County Multi-Jurisdictional Natural Hazard Mitigation Plan (NHMP). This addendum supplements information contained in Volume I (Basic Plan) which serves as the NHMP foundation, and Volume III (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 Carlton's addendum are further discussed throughout the NHMP, and within Volume III, Appendix B, which provides an overview of alterations to the document that took place during the update process.

Carlton adopted their addendum to the Yamhill County Multi-jurisdictional NHMP on **October 6, 2020**. FEMA Region X approved the Yamhill County NHMP and the City's addendum on **December 22, 2020**. With approval of this NHMP the City is now eligible to apply for the Robert T. Stafford Disaster Relief and Emergency Assistance Act's hazard mitigation project grants through **December 21, 2025**.

Mitigation Plan Mission

The NHMP mission states the purpose and defines the primary functions of the 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 City concurs with the mission statement developed during the Yamhill County planning process (Volume I, Section 3):

To promote public policy and mitigation activities which will enhance the safety to life and property from natural hazards.

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

Mitigation Plan Goals

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

The City concurs with the goals developed during the Yamhill County planning process (Volume I, Section 3). All NHMP goals are important and are listed below in no 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.

Below is a list of the NHMP goals:

GOAL 1: EMERGENCY OPERATIONS

- Coordinate natural hazard mitigation activities, where appropriate, with emergency operations plans and procedures and with other agencies.

GOAL 2: EDUCATION AND OUTREACH

- Develop and implement education and outreach programs to increase public awareness of the risks associated with natural hazards.

GOAL 3: PARTNERSHIPS

- Develop effective partnerships with public and private sector organizations and significant agencies and businesses for future natural hazard mitigation efforts.
- Coordinate natural hazard mitigation actions between the County and local jurisdictions to create more cohesive and effective hazard mitigation efforts.

GOAL 4: PREVENTIVE

- Develop and implement activities to protect human life, commerce, and property from natural hazards.
- Reduce losses and repetitive damage for chronic hazard events while promoting insurance coverage for catastrophic hazards.

GOAL 5: NATURAL RESOURCES UTILIZATION

- Link natural resources management, land use planning, and watershed planning with natural hazard mitigation activities to protect natural systems and allow them to serve natural hazard mitigation functions.

GOAL 6: IMPLEMENTATION

- Implement strategies to mitigate the effects of natural hazards and increase the quality of life and resilience of economies in Yamhill County.

GOAL 7: DEVELOPMENT

- Communities appropriately apply development standards that consider the potential impacts of natural hazards.

GOAL 8: DOCUMENTATION

- Document and evaluate progress in achieving hazard mitigation strategies and action items.

Process and Participation

This section of the NHMP addendum addresses 44 CFR 201.6(a)(3), *Participation*.

In addition to establishing a comprehensive community-level mitigation strategy, the Disaster Mitigation Act of 2000 (DMA2K), and the regulations contained in 44 CFR 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 pre-, and post-disaster mitigation project grants.

The Oregon Partnership for Disaster Resilience (OPDR) at the University of Oregon's Institute for Policy Research and Engagement (IPRE) collaborated with the Oregon Office of Emergency Management (OEM), Yamhill County, and Carlton to update their NHMP. This project is funded through the Federal Emergency Management Agency's (FEMA) Hazard Mitigation Grant Program for DR-4328 (HMGP-DR-4328-OR-5-P). Members of the Carlton NHMP Steering committee also participated in the County NHMP update process (Volume III, Appendix B).

The Yamhill County NHMP, and Carlton addendum, are the result of a collaborative effort between citizens, public agencies, non-profit organizations, the private sector, and regional organizations. The Carlton NHMP Steering Committee guided the process of developing the NHMP.

Convener and Committee

The Carlton City Administrator serves as the NHMP addendum convener. The convener of the NHMP will take the lead in implementing, maintaining, and updating the addendum to the Yamhill County NHMP in collaboration with the designated convener of the Yamhill County NHMP (Yamhill County Emergency Manager).

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

This addendum reflects decisions made at the designated meetings, and during subsequent work, and communication with Yamhill County Emergency Manager, and 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, action items, and community profile.

The Carlton steering committee was comprised of the following representatives:

- Convener, Aimee Amerson, Community and Economic Development Coordinator
- Kevin Martinez, Police Chief
- Dennis Durham, City Manager
- Bryan Burnham, Public Works Director
- Christy Martinez, Director of Administrative Services

Public Participation

Public participation was achieved by posting the NHMP publicly and providing community members the opportunity to make comments and suggestions during the review process. Community members were also provided an opportunity for comment via a survey administered by IPRE (Volume III, Appendix F). During the City public review period (Attachment B) there were **no** comments provided.

Implementation and Maintenance

The City Council will be responsible for adopting the Carlton addendum to the Yamhill County NHMP. This addendum designates the 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 Carlton 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 Administrator 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; 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 City will utilize the same action item prioritization process as the County (Volume I, Section 4).

Implementation through Existing Programs

This NHMP is strategic and non-regulatory in nature, meaning that it does not necessarily set forth any new policy. It does, however, provide: (1) a foundation for coordination and collaboration among agencies and the public in the city; (2) identification and prioritization of future mitigation activities; and (3) aid in meeting federal planning requirements and qualifying for assistance programs. The mitigation plan works in conjunction with other city plans and programs including the Comprehensive Land Use Plan, Capital Improvements Plan, and Building Codes, as well as the [Yamhill County NHMP](#), and the [State of Oregon NHMP](#).

The mitigation actions described herein (and priority actions in Attachment A) 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, Carlton 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. Implementation opportunities are further defined in action items when applicable.

Future development without proper planning may result in worsening problems associated with natural hazards. Carlton's acknowledged comprehensive plan is the City of Carlton Comprehensive Plan. The City implements the plan through the Community Development Code.

Carlton currently has the following plans that relate to natural hazard mitigation. For a complete list visit the City's [website](#):

- [Comprehensive Plan, Plan Map](#) (2000, amended 2009)
- [Carlton Municipal Code and Development Code](#)
 - Title 7: Emergency Organization and Functions
 - Title 8: Health and Safety
 - [Chapter 8.08 Fire Limits and Fire Prevention](#)
 - [Chapter 8.24 Burning of Grass, Weeds, Refuse or Other Material](#)
 - Title 17: Development Code
 - [Chapter 17.56 Floodplain Management Overlay Zone](#)
- Building Code, [2017 Oregon State Building Code](#) based on 2015 International Residential Code (IRC), and 2012 International Building Code (*to be updated to the 2020 Oregon State Building Code, anticipated October 2020*)
- [Public Works Design Standards](#)
- [Transportation System Plan](#) (2009), [Appendices](#)
- [Water Management and Conservation Plan](#) (2014)
- Water System Emergency Response Plan (2004)
- Water Vulnerability Assessment (2002, 2007)
- BLM Landslide Study Carlton Reservoir/Panther Creek (1999)
- Sewer Master Plan
- Stormwater Master Plan
- Parks Master Plan

Other plans:

- [Yamhill County Community Wildfire Protection Plan](#) (2009, revised Nov. 2015)

Government Structure

The Carlton City Charter establishes a Council/Manager form of government, which vests policy authority in a volunteer City Council, and administrative authority for day-to-day operations in an appointed, professional City Manager. The Carlton City Council consists of a Mayor, who is elected at-large to serve a two-year term, and six Councilors who serve four-year terms. At least three Council positions are up for election every two years. Councilors are elected at-large. The three candidates who receive the highest number of votes are elected to the vacant seats. The Council meets at least once per month at City Hall. The agenda of each meeting includes time for citizen comment.

The City of Carlton currently has the following departments which have a role in natural hazard mitigation:

Administration services are provided by the City Manager and include strategic planning, budget and finance, and development of public policy recommendations to the City Council.

Public Works provides many of the basic urban services to the citizens of Carlton, including water, wastewater, street, and park systems, and their maintenance and repair.

Building services are provided through a contract with Yamhill County and include plan review and inspections on commercial, industrial and residential developments.

Planning services include all long range and current planning for new development, as well as the City's flood plain management zone. Planning is also responsible for implementation of the Comprehensive Plan.

Police services include law enforcement activities, emergency management (emergency preparedness, mitigation, response and recovery efforts for Carlton during emergencies, disasters, or disruptions).

Fire protection services are provided through a contract with Carlton Fire District. The fire station is in Carlton. Services include fire suppression, hazardous materials incidents, and disaster response. Non-emergency services include fire prevention and inspection services, code enforcement, public safety education services/CPR training, and fire extinguisher use.

Continued Public Participation

An open public involvement process is essential to the development of an effective NHMP. To develop a comprehensive approach to reducing the effects of natural disasters, the planning process shall include opportunities for the public, neighboring communities, local, and regional agencies, as well as, private, and non-profit entities to comment on the NHMP during review.¹ Keeping the public informed of efforts to reduce its risk to future natural hazard events is important for successful NHMP implementation, and maintenance. As such, the City is committed to involving the public in the NHMP review and update process (Volume I, Section 4). The City posted the plan update for public comment before FEMA approval, and after approval will maintain the plan on the City's website:

<https://www.ci.carlton.or.us/>

NHMP Maintenance

The Yamhill County NHMP, and City addendum will be updated every five years in accordance with the update schedule outlined in the Disaster Mitigation Act of 2000. During the County NHMP update process, the City will also review, and update its addendum (Volume I, Section 4). The convener will be responsible for convening the steering committee to address the questions outlined below.

- Are there new partners that should be brought to the table?
- Are there new local, regional, state or federal policies influencing natural hazards that should be addressed?

¹ Code of Federal Regulations, Chapter 44. Section 201.6, subsection (b). 2015

- Has the community successfully implemented any mitigation activities since the NHMP was last updated?
- Have new issues or problems related to hazards been identified in the community?
- Are the actions still appropriate given current resources?
- Have there been any changes in development patterns that could influence the effects of hazards?
- Have there been any significant changes in the community's demographics that could influence the effects of hazards?
- Are there new studies or data available that would enhance the risk assessment?
- Has the community been affected by any disasters? Did the NHMP accurately address the impacts of this event?

These questions will help the steering committee determine what components of the mitigation plan need updating. The steering committee will be responsible for updating any deficiencies found in the NHMP.

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) were first developed during the 2009 NHMP planning process and revised during subsequent NHMP updates. During these processes, the steering committee assessed the City's risk, identified potential issues, and developed a mitigation strategy (action items).

During the 2019-2020 update process the City re-evaluated their mitigation strategy (action items). During this process action items were updated, noting what accomplishments had been made, and whether the actions were still relevant; any new action items were identified at this time (see Volume III, Appendix B for more information on changes to action items).

Priority Action Items

Table CA-1 presents a list of mitigation actions. The steering committee 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 in **bold** text with grey 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 steering committee in terms of implementation, the steering committee 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 detailed information for each high priority action. Full text of the plan goals referenced in Table CA-1 is located on page CA-2.

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Table CA-I Carlton Action Items

Natural Hazard Action ID	Action Item	Coordinating Organization (Lead)	Partners	Potential Funding	Cost	Timing	Plan Goals Addressed							
							Goal 1	Goal 2	Goal 3	Goal 4	Goal 5	Goal 6	Goal 7	Goal 8
Multi-Hazard Actions														
Multi-Hazard #1	Develop, enhance, and implement public education and information materials concerning mitigation, preparedness and safety procedures for identified natural hazards.	Planning	Public Works, Fire District, Police, School District, Administration	General fund, grants	L	Ongoing	✓	✓	✓			✓	✓	
Multi-Hazard #2	Cross reference and incorporate mitigation planning provisions into all community planning processes such as comprehensive, capital improvement, land use, transportation plans, etc to demonstrate multi-benefit considerations and facilitate using multiple funding source consideration.	Planning	Public Works, Administration	General fund, utility rates	M	Medium	✓			✓	✓	✓	✓	
Multi-Hazard #3	Identify critical facilities, especially fire and police departments, without emergency power and encourage these facilities to secure emergency power to mitigate power outage events due to natural hazard events. Consider solar battery options due to PGE policy changes during fire risk. Consider outreach to private property owners.	Public Works	Planning, Fire, Administration, School District, PGE/BPA	General fund, utility rates	H	Medium	✓		✓			✓	✓	

Natural Hazard Action ID	Action Item	Coordinating Organization (Lead)	Partners	Potential Funding	Cost	Timing	Plan Goals Addressed							
							Goal 1	Goal 2	Goal 3	Goal 4	Goal 5	Goal 6	Goal 7	Goal 8
Multi-Hazard #4	Develop public and private sector partnerships to foster hazard mitigation activities.	Administration	Planning, Public Works, Fire, Police, CBA	General fund, grants	L	Short	✓	✓	✓	✓		✓		✓
Multi-Hazard #5	Perform hydrologic and hydraulic engineering, and drainage studies and analyses. Use information obtained for feasibility determination and project design. This information should be a key component, directly related to a proposed project.	Administration	Planning, Public Works, Tetra Tech	General fund, grants, Utility rates	H	Short	✓	✓	✓	✓		✓		✓
Multi-Hazard #6	Promote resilience, response, mitigation, and recovery planning for local businesses to continue operating after a disaster.	Administration	Planning, Public Works, Police, Fire, CBA	General funds, grants, private investment	L	Ongoing	✓	✓	✓	✓		✓	✓	✓

Drought Actions

No actions Identified at this time

Earthquake Actions

Earthquake #1	Conduct seismic strength evaluations of critical facilities and infrastructure to identify vulnerabilities and seismically retrofit (structural and nonstructural) identified critical facilities and infrastructure to meet life safety standards in order to continue operations post-earthquake.	Public Works	School District, Fire District, Planning	General funds, utility fees, grants	H	Medium		✓	✓	✓		✓	✓	✓
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Natural Hazard Action ID	Action Item	Coordinating Organization (Lead)	Partners	Potential Funding	Cost	Timing	Plan Goals Addressed							
							Goal 1	Goal 2	Goal 3	Goal 4	Goal 5	Goal 6	Goal 7	Goal 8
Earthquake #2	Seismically retrofit (structural and nonstructural) identified high risk critical facilities and infrastructure to meet life safety standards in order to continue operations post-earthquake.	Administration	Public Works, School District, Fire District, Planning, City Engineer	General fund, utility fees, grants	H	Long		✓	✓	✓		✓	✓	✓
Earthquake #3	Encourage utility companies to evaluate and harden vulnerable infrastructure elements for sustainability.	Public Works	Utilities, Planning, Administration	General fund, permit fees	L	Ongoing		✓	✓	✓		✓	✓	✓
Earthquake #4	Educate property owners about structural and non-structural retrofitting of vulnerable buildings and encourage retrofit.	Planning	FEMA, DLCD, OEM	General fund, permit fees	L	Ongoing		✓	✓	✓				
Earthquake #5	Develop an outreach program to educate and encourage homeowners and tenants to secure furnishings, storage cabinets, and utilities to prevent injuries and damage.	Planning	FEMA, DLCD, OEM	General fund, permit fees	L	Ongoing		✓	✓	✓				
Flood Actions														
Flood #1	Ensure continued compliance in the National Flood Insurance Program (NFIP) through enforcement of local floodplain management ordinances.	Planning	Administration, Public Works	General fund	L	Ongoing	✓	✓	✓	✓	✓	✓	✓	✓
Flood #2	Work with FEMA to update FIRMs. Request DOGAMI debris flow and lidar data be included in FIRM updates. Use the updated FIRMS for land use and mitigation planning.	Planning	Public Works, FEMA, DOGAMI, DLCD	General fund, HMA	M	Mid-Term	✓		✓	✓		✓		✓

Natural Hazard Action ID	Action Item	Coordinating Organization (Lead)	Partners	Potential Funding	Cost	Timing	Plan Goals Addressed							
							Goal 1	Goal 2	Goal 3	Goal 4	Goal 5	Goal 6	Goal 7	Goal 8
Flood #3	Provide flood protection to mitigate damage and contamination of wastewater treatment systems.	Public Works	Planning	General fund, utility fees	H	Long	✓		✓	✓		✓		✓
Flood #4	Install new streamflow and rainfall measuring gauges to better inform community and emergency responders of flood risk.	Public Works	Planning, Administration	Stormwater utility fees	L	Short Term	✓		✓	✓		✓		✓
Flood #5	Implement mitigation measures identified by critical facilities' owners, and other facility owners, to protect facilities located within the 100-year floodplain.	Administration	Planning, Public Works, Fire District, Police, School District	General fund, HMA	H	Long Term			✓	✓		✓		✓
Landslide Actions														
Landslide #1	Utilize technology, geologic resources and other available data (such as DOGAMI LIDAR data) to identify and map potential areas for landslides - high, moderate and low.	Planning	DOGAMI, Engineering, MW&L	General fund, utility fees, grants	M	Short	✓	✓	✓			✓		✓
Severe Weather Actions (Windstorm and Winter Storms – Snow/Ice)														
Severe Weather #1	Develop and implement programs to coordinate maintenance and mitigation activities to reduce risk to public infrastructure from severe winter storms.	Public Works	Planning, Administration	General fund, Utility fees	M	Ongoing		✓	✓	✓		✓		✓
Severe Weather #2	Purchase NOAA weather radios and develop a web portal linking residents to various weather information sites. (NWS, FEMA, The Weather Channel).	Public Works	Planning, Fire District, Police, School District	General funds, utility fees, grants	L	Short		✓		✓		✓		✓

Natural Hazard Action ID	Action Item	Coordinating Organization (Lead)	Partners	Potential Funding	Cost	Timing	Plan Goals Addressed							
							Goal 1	Goal 2	Goal 3	Goal 4	Goal 5	Goal 6	Goal 7	Goal 8
Severe Weather #3	Identify and prioritize critical facilities' overhead utilities that could be placed underground to reduce power disruption from windstorm / tree blow down damage.	Public Works	Planning, Utilities, property owners	General funds, utility fees, grants	H	Medium		✓	✓	✓		✓		✓
Severe Weather #4	Implement tree clearing mitigation programs to keep trees from threatening lives, property, and public infrastructure from severe weather events.	Public Works	Planning, Utilities, property owners	General funds, utility fees, grants	M	Ongoing		✓	✓	✓	✓	✓		✓
Volcanic Event Actions														
Volcanic Event #1	Evaluate ash impact on stormwater drainage system, utility infrastructure, transportation network, public facilities, and develop mitigation actions.	Engineering	Public works, Police, Fire District	General funds, utility fees, grants	L	Medium				✓	✓	✓		✓
Wildfire Actions														
Wildfire #1	Coordinate wildfire mitigation action items through the Yamhill County Community Wildfire Protection Plan.	Fire District	Planning	General fund, ODF, grants	M	Ongoing	✓	✓	✓	✓	✓	✓	✓	✓
Wildfire #2	Provide wildland fire information in an easily distributed format for all residents.	Fire District	Planning	General fund, utility fees	L	Ongoing	✓	✓	✓			✓		✓
Wildfire #3	Develop, implement, and enforce vegetation management codes/plans to reduce wildfire risk.	Planning, Fire	Public Works	General fund, grants	L	Short		✓	✓	✓	✓	✓	✓	✓

Natural Hazard Action ID	Action Item	Coordinating Organization (Lead)	Partners	Potential Funding	Cost	Timing	Plan Goals Addressed							
							Goal 1	Goal 2	Goal 3	Goal 4	Goal 5	Goal 6	Goal 7	Goal 8
Wildfire #4	Conduct residential audits for wildland and building fire hazard identification then develop an outreach program to disseminate the findings.	Fire	Planning, Public Works	General fund, grants	L	Short		✓	✓	✓	✓	✓	✓	✓

Source: City of Carlton steering committee, 2020.

Note: Full text of the plan goals referenced in this table is located on page CA-2.

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, Section 2, and Volume III, Appendix C. The risk assessment process is graphically depicted in Figure CA-1. Ultimately, the goal of hazard mitigation is to reduce the area of risk, where hazards overlap vulnerable systems.

Figure CA-1 Understanding Risk



Hazard Analysis

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

Table CA-2 shows the HVA matrix for Carlton 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 sense of hazard priorities but does not predict the occurrence of a hazard.

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

Table CA-2 Hazard Analysis Matrix

Hazard	Maximum				Total Threat Score	Hazard Rank	Hazard Tiers
	History	Vulnerability	Threat	Probability			
Winter Storm	16	40	80	56	192	#1	Top Tier
Earthquake - Cascadia	6	45	100	35	186	#2	
Windstorm	16	25	70	56	167	#3	
Flood	18	20	60	63	161	#4	
Wildfire	4	20	80	28	132	#5	Middle Tier
Drought	10	15	50	56	131	#6	
Earthquake - Crustal	6	20	60	21	107	#7	
Landslide	6	15	30	21	72	#8	Bottom Tier
Volcanic Event	4	10	30	7	51	#9	

Source: Carlton steering committee, 2019-2020.

Table CA-3 categorizes the probability, and vulnerability scores from the hazard analysis for the City and compares the results to the assessment completed by the Yamhill County steering committee. Variations between the City, and County are noted in **bold** text within the city ratings.

Table CA-3 Probability and Vulnerability Comparison

Hazard	Carlton		Yamhill County	
	Probability	Vulnerability	Probability	Vulnerability
Drought	High	Low	High	Moderate
Earthquake - Cascadia	Moderate	High	Moderate	High
Earthquake - Crustal	Low	Moderate	Low	Moderate
Flood	High	Moderate	High	High
Landslide	Low	Low	High	Low
Volcanic Event	Low	Low	Low	Low
Wildfire	Moderate	Moderate	Low	Low
Windstorm	High	Moderate	High	Moderate
Winter Storm	High	High	High	High

Source: Carlton and Yamhill County steering committee, 2019-2020.

Community Characteristics

Table CA-4 and the following section provides information on City specific demographics, and assets. 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. Between 2012 and 2019 the City grew by 660 people (41%).² According to the State's official coordinated population forecast, between 2019 and 2040 the City's population is forecast to grow by 41% to 3,204.³ *Note: the State is currently updating the official forecast and the proposed 2040 population is 3,152 which represents a 39% increase from 2019 population.*⁴ Median household income increased by 8% between 2012 and 2017.⁵

New development has complied with the standards of the [Oregon Building Code](#), and the city's development code including their floodplain ordinance.

Economy

The City of Carlton is in the north-central portion of Yamhill County along Highway 47. The economy of Carlton is largely related to agriculture and supporting services. Carlton's commercial areas developed along primary routes, and residential development followed nearby (see Figure CA-2).

Most workers residing in the city (97%, 824 people) travel outside of the city for work primarily to McMinnville, Portland Metro area, Newberg, and Salem.⁶ Most of the city's workforce travels to the city (93% of the workforce, 355 people) primarily from McMinnville, Newbery, and the City of Yamhill.

Carlton residents are employed in a variety of occupations including: construction, extraction, and maintenance (17%), professional (16%), office and administrative support (11%), management, business, and financial operations (9%), and sales (8%) occupations.⁷

The largest employer in the city is the Yamhill Carlton School District.

² Portland State University, Population Research Center, "Annual Population Estimates", 2019.

³ Portland State University, Population Research Center, "Oregon Population Forecast Program Cycle 1 (2014-2017)". 2017.

⁴ Portland State University, Population Research Center, "Oregon Population Forecast Program Cycle 2 (2018-2020)". 2020 (proposed).

⁵ Social Explorer, Table T57, U.S. Census Bureau, 2013-2017 and 2008-2012 American Community Survey Estimates.

⁶ U.S. Census Bureau. LEHD Origin-Destination Employment Statistics (2002-2017). Longitudinal-Employer Household Dynamics Program, accessed on April 25, 2020 at <https://onthemap.ces.census.gov>.

⁷ Social Explorer, Table A17008, U.S. Census Bureau, 2013-2017 American Community Survey Estimates.

Table CA-4 Community Characteristics

Population Characteristics		
2012 Population	1,610	
2019 Population	2,270	
2040 Forecasted Pop. [Proposed]*	3,204	[3,152]
Race (non-hispanic) and Ethnicity (Hispanic)		
White	85%	
Black/ African American	0%	
American Indian and Alaska Native	< 1%	
Asian	1%	
Native Hawaiian and Other Pacific Islander	0%	
Some Other Race	< 1%	
Two or More Races	5%	
Hispanic or Latino	9%	
Limited or No English Spoken	19	1%
Vulnerable Age Groups		
Less than 15 Years	445	23%
65 Years and Over	212	11%
Disability Status		
Total Population	257	13%
Children	29	5%
Seniors	48	23%
Income Characteristics		
Households by Income Category		
Less than \$15,000	40	6%
\$15,000-\$29,999	70	11%
\$30,000-\$44,999	69	11%
\$45,000-\$59,999	95	15%
\$60,000-\$74,999	104	16%
\$75,000-\$99,999	108	17%
\$100,000-\$199,999	150	24%
\$200,000 or more	-	-
Median Household Income	\$63,875	
Poverty Rates		
Total Population	122	6%
Children	44	8%
Seniors	13	6%
Housing Cost Burden		
Owners with Mortgage	120	25%
Renters	62	42%

Source: U.S. Census Bureau, 2013-2017 American Community Survey; Portland State University, Population Research Center, "Annual Population Estimates", 2019. Portland State University, Population Research Center, "Oregon Population Forecast Program Cycle 1 (2014-2017)". 2017. and "Oregon Population Forecast Program Cycle 2 (2018-2020)". 2020 (proposed).

Housing Characteristics		
Housing Units		
Single-Family	644	93%
Multi-Family	23	3%
Mobile Homes	29	4%
Year Structure Built		
Pre-1970	300	43%
1970-1989	112	16%
1990-2009	263	38%
2010 or later	21	3%
Housing Tenure and Vacancy		
Owner-occupied	489	70%
Renter-occupied	147	21%
Seasonal	9	1%
Vacant	51	7%

Carlton is in the north-central portion of Yamhill County. The North Yamhill River and Hawn Creek are the two drainage basins within the city.

Carlton is generally flat with hills located to the west of the city and in the area of the city's water treatment plant and reservoir. Soils in Carlton are moderately well-drained silt loam of the Woodburn series and the poorly drained Wapato silt loam series. The area is largely agricultural with uncultivated vegetation consisting of scattered Oak and Douglas Fir.

Carlton's temperatures range from a monthly average low of 34-38°F in the winter months to average highs of 75-83°F in the summer months. The coolest month is December and the warmest months are July and August. The average annual precipitation is about 42 inches and approximately 74% falls between November and March.

The City has an educated population with 88% of residents 25 years, and older holding a high school degree and 15% have a bachelor's degree or higher.

Carlton includes industrial and commercial development but is zoned primarily residential.

Figure CA-2 Oregon Transportation Map: City of Carlton



Source: Oregon Department of Transportation

Community Assets

This section outlines the resources, facilities, and infrastructure that, if damaged, could significantly impact the public safety, economic conditions, and environmental integrity of Carlton.

Critical facilities and infrastructure are those that support government and first responders' ability to act in an emergency. They are a top priority in any comprehensive hazard mitigation plan. These include locally designated shelters and other essential assets, such as fire stations, and water and wastewater treatment facilities (see Table CA-5). **Essential facilities and infrastructure** are those that support the continued delivery of key government services, and/or that may significantly impact the public's ability to recover from the emergency. These facilities may include: City buildings and other public facilities such as schools.

It is important to note that the facilities identified as "critical" and "essential" are characterized differently than the structural code that identifies buildings as "essential" and "non-essential." The structural code uses different language and criteria and therefore have completely different meanings than the buildings identified in this addendum.

Table CA-5 Critical and Essential Facilities

Facility Name	Address	
Government		
<i>See Table CA-6 for information on seismic vulnerability.</i>		
City Hall/EOC	191 E Main St	Critical
Water Treatment Plant	21511 NW Panther Creek Rd	Critical
Carlton Reservoir (not in City)	8-miles west (Panther Creek)	Critical
Public Works	945 W Grant	Critical
Sewage Lagoons (not in City)	1-mile west of city limits	Critical
US Post Office	438 W Main St	Essential
Emergency Response		
Fire District Station	343 W Roosevelt St	Critical
Police (City Hall)	191 E Main St	Critical
Educational (Public)		
Elementary School	300 Rice Ln	Essential
Community Assets		
Carlton Swimming Pool	225 W Grant St	

Transportation/Infrastructure

Mobility plays an important role in Carlton, and the daily experience of its residents, and businesses. Motor vehicles represent the dominant mode of travel through, and within Carlton. Carlton is served by Yamhill County Transit (route 33 connects Carlton to Forest Grove to the north and McMinnville to the south).

Infrastructure that provides critical and essential services include:

Railroads

There is no freight or passenger rail service in the city.

Airports

The city has no commercial service airports, however Portland International Airport (PDX), the largest and busiest airport in the state, is in nearby Multnomah County. The closest municipal airport is in McMinnville.

Roads/Seismic lifelines

The Tualatin Valley Highway (OR 47) is the major north-south transportation route through the city. Main St/Meadow Lake Rd/Hendricks Rd is the major east-west transit route in the city (see Figure CA-2).

Seismic lifeline routes help maintain transportation facilities for public safety and resilience in the case of natural disasters. Following a major earthquake, it is important for response and recovery agencies to know which roadways are most prepared for a major seismic event. The Oregon Department of Transportation has identified lifeline routes to provide a secure lifeline network of streets, highways, and bridges to facilitate emergency services response after a disaster.⁸

System connectivity and key geographical features were used to identify a three-tiered seismic lifeline system. Routes identified as Tier 1 are considered the most significant and necessary to ensure a functioning statewide transportation network. The Tier 2 system provides additional connectivity to the Tier 1 system, it allows for direct access to more locations and increased traffic volume capacity. The Tier 3 lifeline routes provide additional connectivity to the systems provided by Tiers 1 and 2.

The Lifeline Routes in Carlton:

- Tier I: None
- Tier II: None
- Tier III: None

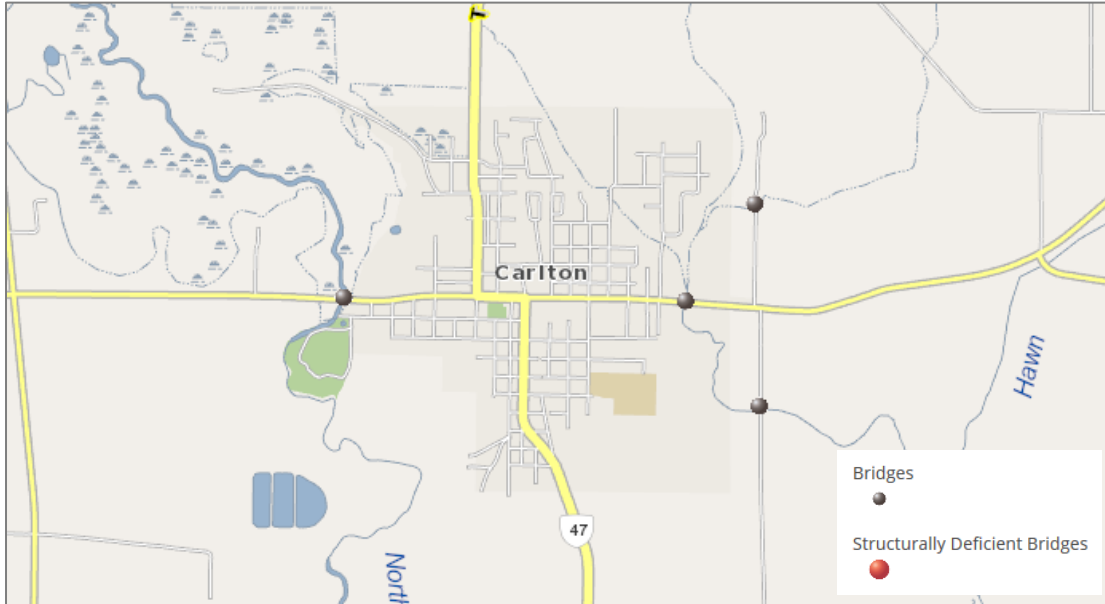
Bridges

Because of earthquake risk, the seismic vulnerability of the county's bridges is an important issue. Non-functional bridges can disrupt emergency operations, sever lifelines, and disrupt local and freight traffic. These disruptions may exacerbate local economic losses if industries are unable to transport goods. Bridges within the city that are critical or essential include:

- North Yamhill River, Meadow Lake Rd (ODOT 20066)
- Hawn Creek, Hendricks Rd (ODOT 11594A)

⁸ Oregon Department of Transportation. Oregon Seismic Lifeline Evaluation Vulnerability Synthesis Identification, *Oregon Seismic Lifeline Routes*, May 15 2012. Page 6-4 figure 6-1. Accessed September 12, 2019.

Figure CA-3 Oregon Bridges and Structurally Deficient Bridges



Source: Oregon Department of Transportation, ODOT TransGIS, accessed April 29, 2020

Utility Lifelines

Utility lifelines are the resources that the public relies on daily such as, electricity, fuel and communication lines. If these lines fail or are disrupted, the essential functions of the community can become severely impaired. Utility lifelines are closely related to physical infrastructures, like dams and power plants, as they transmit the power generated from these facilities.

Generally, the network of electricity transmission lines running throughout the city is operated by Portland General Electric.⁹ The Williams Gas Pipeline provides natural gas that is delivered to customers in the city by Northwest Natural Gas. These lines may be vulnerable as infrequent natural hazards, like earthquakes, could disrupt service to natural gas consumers across the region.

The city water and wastewater systems include the following:

- Panther Creek Reservoir (8 miles west of the city on Panther Creek)
- Water treatment plant (21511 NW Panther Creek Road)
- Two water storage tanks (1.38 MG, 1 mile west of the city)
- Lift station 1 (Howe) and Lift station 2 (Hahn)
- Approx. 47,000 feet transmission pipes
- Approx. 63,000 feet of distribution pipes
- 3 Sewer treatment lagoons (1 mile west of the city)
- Pump stations

⁹ Allan, Stuart et. al., Atlas of Oregon. Pg. 102.

Environmental Assets/Parks:

Environmental assets are those parks, green spaces, wetlands, and rivers that provide an aesthetic, and functional ecosystem services for the community include: Ladd Park, Wennerberg Park (Disc Golf), and Hawn Creek Park.

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:

Child Care Facilities

Yamhill Carlton Together Cares Learning for Life Preschool
Yamhill Carlton Child Development Center

Adult Care Facilities

None

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 Carlton 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. The following historic resources can be found in the City of Carlton:

Carlton State Bank and Savings Building (NW corner of Main and Pine)
Westerlook Farm (Charles Ladd Estate)
Wennerberg Wooden Barn (SW corner of Park and Taft)
Brooks Hotel and theater building (116 W Main Street)
Carlton Elementary school (229 E Monroe Street)
Southern Pacific Railroad Depot (120 N Pine Street)
Carlton Grain Elevator (168 S Pine Street)

Hazard Characteristics

Drought

The steering committee determined that the City's probability for drought is **high**, and that their vulnerability to drought is **low**.

Volume I, Section 2 describes the characteristics of drought hazards, history, as well as the location, extent, and probability of a potential event. Due to the climate of Yamhill County, past, and present weather conditions have shown an increasing potential for drought.

The City's primary water source is from Panther Creek Reservoir and Panther Creek. The City also has a water right permit for a potential source on Fall Creek and from the Willamette

River via the Yamhill Regional Water Authority (although infrastructure is not yet developed to access this source).

The city has one water reservoir (Panther Creek Reservoir) that holds 66-acre feet. The city's water treatment plant (ca. 2002) has the capacity of to treat 1.2 million gallons per day (MGD). The city has two storage tanks that hold a combined 1.38 million gallons (MG) that are located one mile west of the city. The city has approximately 63,000 feet of distribution pipes and 47,000 feet of transmission pipes. The City has adequate capacity for existing needs.

Vulnerability Assessment

Due to insufficient data and resources, Carlton is currently unable to perform a quantitative risk assessment, or exposure analysis, for this hazard. State-wide 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 apply to humans and resources. Industries important to the City of Carlton's local economy such as agriculture, and timber have historically been affected, and any future droughts would have tangible economic and potentially human impacts.

Mitigation Activities

The City engages in water conservation measures including water line leak detection and repair, replacement of deteriorating pipe (including major transmission and distribution line improvements in 2015), and replacement/repair of older and under-registering water meters and reducing dead end lines in order to increase water circulation throughout the system.

Carlton Codes Pertaining to Droughts

The following Carlton codes, plans, and policies pertain to droughts:

1. Carlton Comprehensive Plan, "Water Resources" and "Natural Hazards".
2. Carlton provides water conservation tips to residents that include voluntary measures individuals and households can take to increase conservation of water during times of low water availability.
3. The City has a Water Management and Conservation Plan.

Please review Volume I, Section 2 for additional information on this hazard.

Earthquake (Cascadia Subduction Zone)

The steering committee determined that the City's probability for a Cascadia Subduction Zone (CSZ) earthquake is **moderate** and that their vulnerability to a CSZ earthquake is **high**.

Volume I, Section 2 describes the characteristics of earthquake hazards, history, as well as the location, extent, and probability of a potential event. Generally, an event that affects the County is likely to affect Carlton as well. The causes, and characteristics of an earthquake event are appropriately described within the 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 Carlton as well.

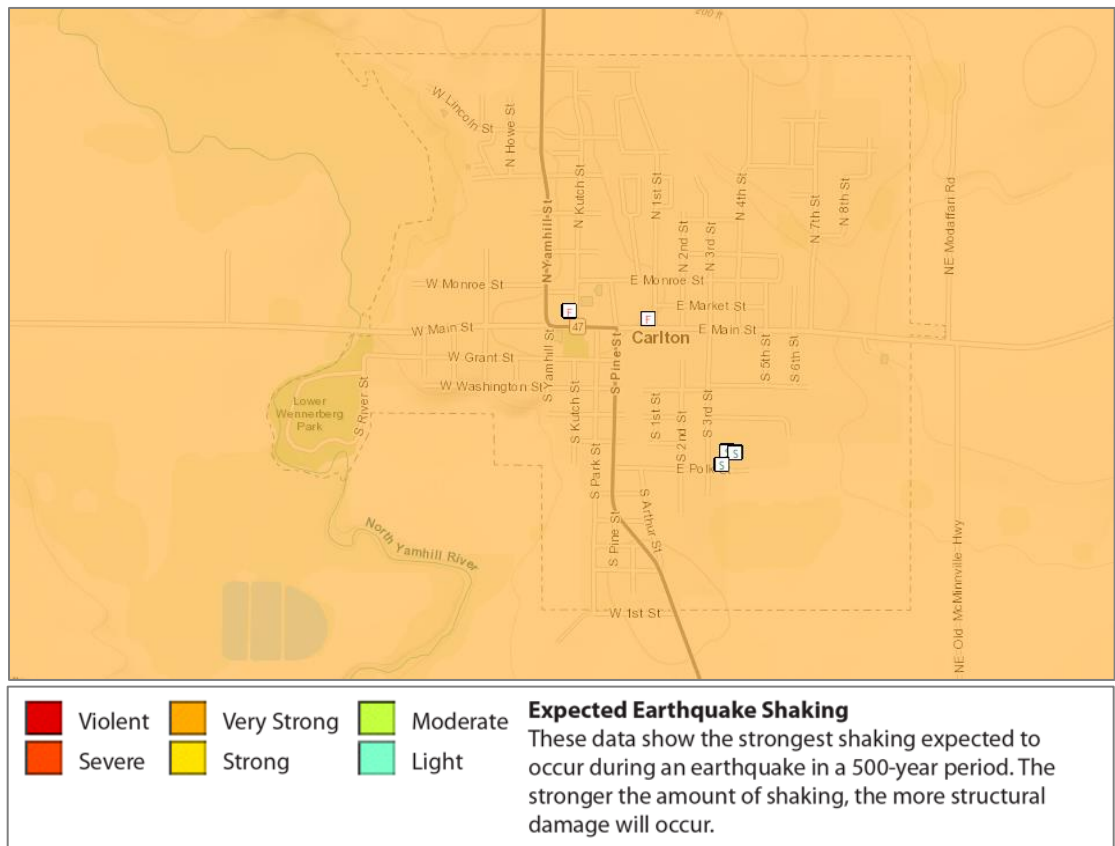
Within the Northern Willamette Valley are that includes Yamhill County, two potential faults and/or zones can generate high-magnitude earthquakes. These include the Cascadia Subduction Zone and the Gales Creek-Newberg-Mt. Angel Structural Zone (including the Newberg Fault).

Cascadia Subduction Zone

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 approximately 1700 A.D.¹⁰

Figure CA-4 displays relative shaking hazards from a Cascadia Subduction Zone earthquake event. As shown in the figure, the City is expected to experience very strong (orange) shaking in a CSZ event.

Figure CA-4 Cascadia Subduction Zone Expected Shaking



Source: [Oregon HazVu: Statewide Geohazards Viewer \(DOGAMI\)](#)

Note: To view detail click the link above to access Oregon HazVu.

¹⁰ The Cascadia Region Earthquake Workgroup, 2005. Cascadia Subduction Zone Earthquakes: A magnitude 9.0 earthquake scenario. <http://www.crew.org/PDFs/CREWSubductionZoneSmall.pdf>

The city'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 City 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 Carlton within the "Valley Zone" (Valley Zone, from the summit of the Coast Range to the summit of the Cascades). Within the Northwest Oregon region, 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.

Earthquake (Crustal)

The steering committee determined that the City's probability for a crustal earthquake is **low** and that their vulnerability to crustal earthquake is **moderate**.

Volume I, Section 2 describes the characteristics of earthquake hazards, history (see below), as well as the location, extent, and probability of a potential event. Generally, an event that affects the County is likely to affect Carlton 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 Carlton as well.

Figure CA-5 shows a generalized geologic map of the Carlton area that includes the areas for potential regional active faults, earthquake history (1971-2008), and soft soils (liquefaction) hazard. The figure shows the areas of greatest concern within the City limits as red (High liquefaction hazard). The inset map shows the county including the Newberg Fault and hazard history.

Vulnerability Assessment (subduction zone and crustal)

Due to insufficient data and resources, Carlton is currently unable to perform a quantitative risk assessment for this hazard. The western portion of Yamhill County is likely to experience higher levels of shaking than the eastern portion, as a result of its proximity to the Cascadia Subduction Zone.

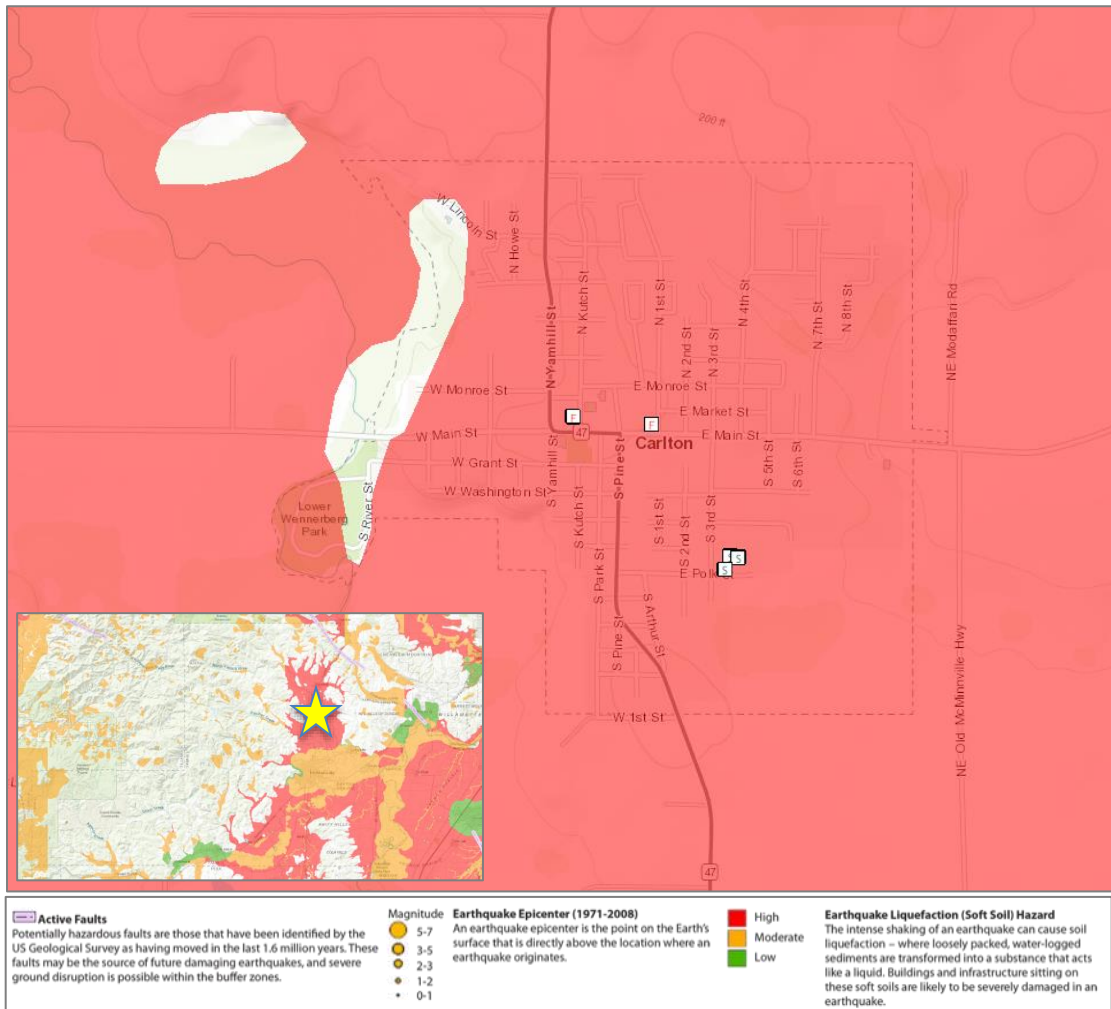
The City of Carlton is in the north-central portion of Yamhill County, in a region likely to experience strong shaking should a subduction zone or significant crustal earthquake occur. This rating represents the peak acceleration of the ground caused by the earthquake, and for a strong designation corresponds to 9-20 percent of the acceleration of gravity. The City is also in an area prone to liquefaction (soft soils) during either a subductions zone or crustal earthquake event. Carlton is located more distant from crustal earthquake faults (the closest is the Newberg fault approximately 10 miles to the east) and has not experienced a damaging earthquake.

Ground movement is likely to cause damage to weak, unreinforced masonry buildings, and to induce small landslides along unstable slopes. As well as landslide, earthquakes can trigger other hazards such as dam failure and disruption of transportation and utility systems.

Panther Creek Reservoir and the city's water mains are vulnerable to seismic activity. The drainage basin above the dam is 3.19 square miles. There has been some erosion caused by tree removal activities by local landowners during the rainy season. There is a main 4.5

mile, 10-inch diameter transmission line to the city, and includes a 6-inch emergency connection to the McMinnville Water and Light main transmission line.

Figure CA-5 Active Crustal Faults, Epicenters (1971-2008), and Soft Soils



Source: [Oregon HazVu: Statewide Geohazards Viewer \(DOGAMI\)](#)

Note: To view detail click the link above to access Oregon HazVu.

Utility systems will be significantly damaged, including damaged buildings, and damage to utility infrastructure, including water 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. 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.

Building codes were implemented in Oregon in the 1970s, however, stricter standards did not take effect until 1991 and early 2000s. As noted in the community characteristics section (Table CA-4), approximately 59% of residential buildings were built prior to 1990, which increases the City's vulnerability to the earthquake hazard. Information on specific

public buildings' (schools and public safety) estimated seismic resistance, determined by DOGAMI in 2007, is shown in Table CA-6; each "X" represents one building within that ranking category. Of the facilities evaluated by DOGAMI using their Rapid Visual Survey (RVS), none have a very high (100% chance) collapse potential, three buildings, two at Carlton Elementary School and the Carlton Fire Station, have a high (greater than 10% chance) collapse potential.

Table CA-6 Rapid Visual Survey Scores

Facility	Site ID*	Level of Collapse Potential			
		Low (<1%)	Moderate (>1%)	High (>10%)	Very High (100%)
Schools					
Carlton Elementary (420 S 3rd)	Yamh_sch02	X		X,X	
Public Safety					
Carlton Fire (209 N Kutch St)	Yamh_fir04			X	
Carlton Police/City Hall/EOC (191 E Main St)	Yamh_pol09	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 Yamhill County Map](#)

Mitigation Activities

Earthquake mitigation activities listed here include current mitigation programs and activities that are being implemented by Carlton agencies or organizations.

A primary mitigation objective is to construct or upgrade critical and essential facilities and infrastructure to withstand future earthquake events. Seismic retrofit grant awards per the [Seismic Rehabilitation Grant Program](#)¹¹ are available via the Oregon Infrastructure Finance Authority.

Carlton Codes Pertaining to Earthquakes

The following Carlton codes, plans, and policies pertain to earthquakes:

1. Carlton Comprehensive Plan, "Natural Hazards".
2. The City of Carlton enforces the [Oregon Building Code](#) which includes provisions for earthquakes.

Please review Volume I, Section 2 for additional information on this hazard.

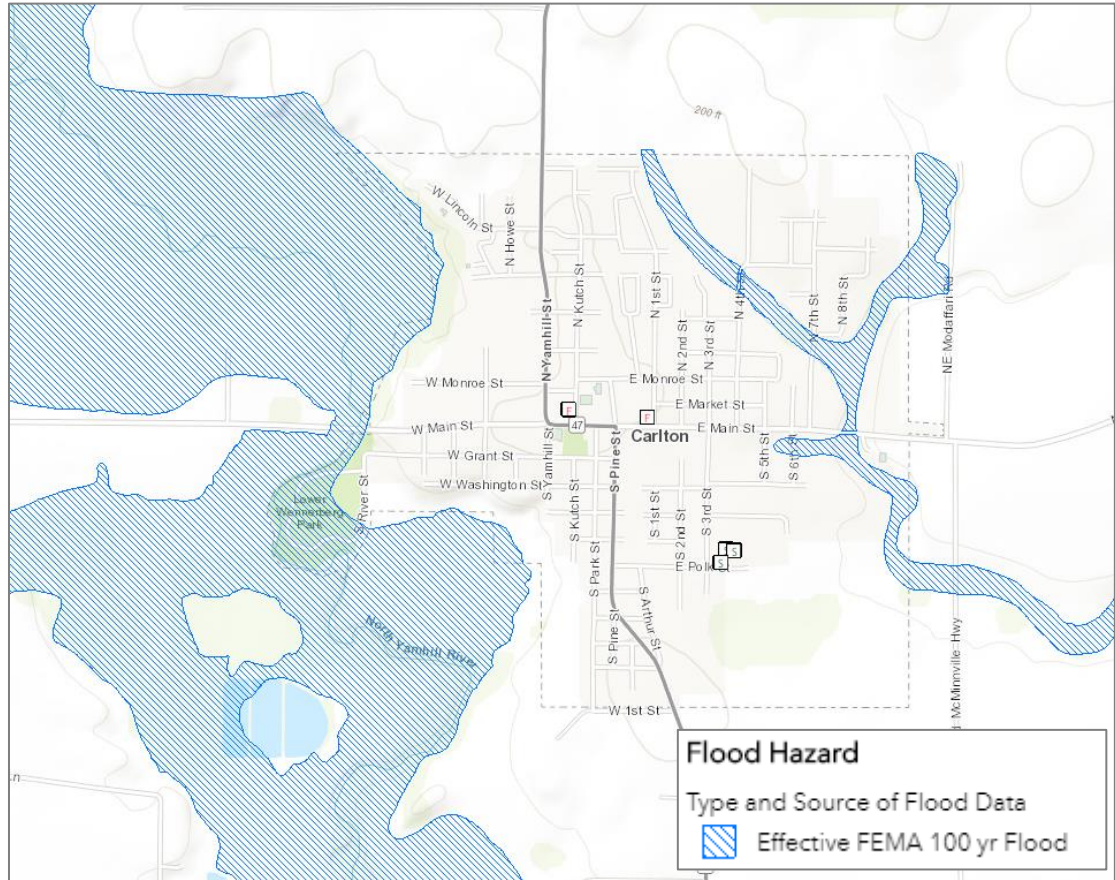
¹¹ The Seismic Rehabilitation Grant Program (SRGP) is a state of Oregon competitive grant program that provides funding for the seismic rehabilitation of critical public buildings, particularly public schools and emergency services facilities.

Flood

The steering committee determined that the City’s probability for flood is **high** and that their vulnerability to flood is **moderate**.

Volume I, Section 2 describes the characteristics of flood hazards, history, as well as the location, extent, and probability of a potential event. Portions of Carlton have areas of floodplains (special flood hazard areas, SFHA). These include areas include the North Yamhill River along the city’s west boundary and the Hawn Creek in the northeast section of the city (Figure CA-6).

Figure CA-6 Special Flood Hazard Area



Source: [Oregon HazVu: Statewide Geohazards Viewer \(DOGAMI\)](#)

Note: To view detail click the link above to access Oregon HazVu.

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 Carlton 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.

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. Business owners, and their employees are significantly impacted by flood events. Direct damages from flooding are the most common impacts, but indirect damages, such as diminished clientele, can be just as debilitating to a business.

Vulnerability Assessment

Due to insufficient data and resources, Carlton is currently unable to perform a quantitative risk assessment for this hazard. FEMA FIRMs were used to outline the 100-year and 500-year floodplains for the City of Carlton. The 100-year floodplain delineates an area of high risk, while the 500-year floodplain delineates an area of moderate risk. Most special flood hazard areas are within agricultural or open space use. Commercial development is generally located in the center of Carlton and is outside the special flood hazard area. The city's sewage lagoons are in an area susceptible to flooding from the North Yamhill River. A few residential properties to the east are susceptible to flooding of under one-foot flooding from Hawn Creek. Additionally, the city's water supply at Panther Creek Reservoir is within a special flood hazard area.

National Flood Insurance Program (NFIP)

FEMA's Flood Insurance Study (FIS), and Flood Insurance Rate Maps (FIRMs) are effective as of March 2, 2010. Table CA-7 shows that as of August 2019, Carlton has one (1) National Flood Insurance Program (NFIP) policies in force for a single-family residential property built after the initial FIRMs. The city has never had a Community Assistance Visit (CAV) and does not participate in the Community Rating System (CRS). There have been no paid flood insurance claims. The City complies with the NFIP through enforcement of their flood damage prevention ordinance and their floodplain management program.

The Community Repetitive Loss record for Carlton identifies no Repetitive Loss Properties¹² or Severe Repetitive Loss Properties¹³.

Mitigation Activities

Flood mitigation activities listed here include current mitigation programs and activities that are being implemented by Carlton agencies or organizations.

Carlton Codes Pertaining to Flooding

The following Carlton codes, plans, and policies pertain to flooding:

1. Carlton Comprehensive Plan, "Natural Hazards".

¹² 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.

¹³ 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.

2. Carlton Development Code Chapter 17.56 *Floodplain Management Overlay Zone*. This portion of the Community Development Code implements the Goal 7 policies of the Comprehensive Plan and regulates development within the floodplain.

Table CA-7 Flood Insurance Detail

	Yamhill County	Carlton
Effective FIRM and FIS	3/2/2010	3/2/2010
Initial FIRM Date	-	6/30/1976
Total Policies	446	1
Pre-FIRM Policies	153	0
Policies by Building Type		
Single Family	401	1
2 to 4 Family	14	0
Other Residential	10	0
Non-Residential	21	0
Minus Rated A Zone	72	0
Insurance in Force	\$100,617,300	\$350,000
Total Paid Claims	81	0
Pre-FIRM Claims Paid	68	0
Substantial Damage Claims	3	0
Total Paid Amount	\$1,166,076	\$0
Repetitive Loss Structures	4	0
Severe Repetitive Loss Properties	1	0
CRS Class Rating	-	NP
Last Community Assistance Visit	-	NA

Source: Department of Land Conservation and Development, August 2019. Repetitive Flood Loss information provided by FEMA correspondence on September 10, 2020.
 NP = Not Participating, NA = Not Applicable

Please review Volume I, Section 2 for additional information on this hazard.

Landslide

The steering committee determined that the City’s probability for landslide is **low** and that their vulnerability to landslide is **low**.

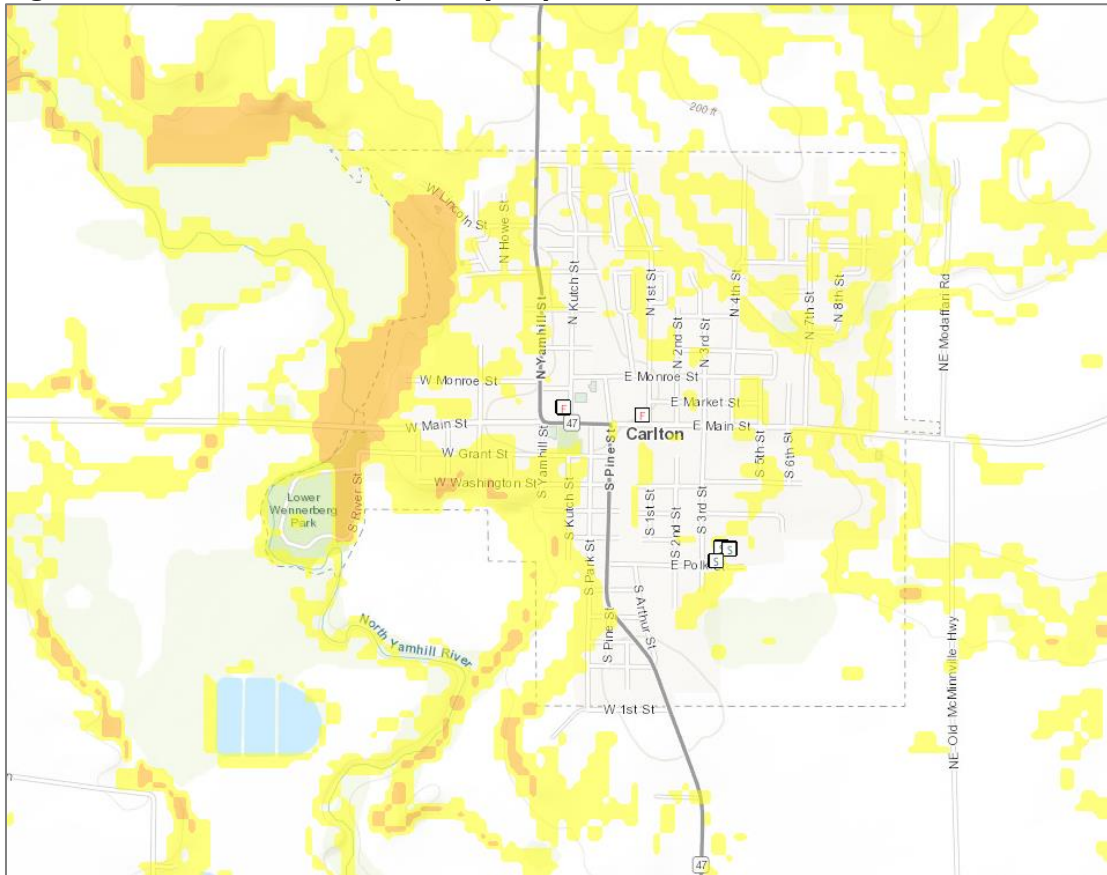
Volume I, Section 2 describes the characteristics of landslide hazards, history, as well as the location, extent, and probability of a potential event within the region.

Landslide susceptibility exposure for Carlton is shown in Figure CA-7. Approximately 5% of Carlton has very high or high, and approximately 33% moderate, landslide susceptibility exposure.¹⁴ Within the City areas of higher landslide risk tend to be located adjacent to the North Yamhill River and Hawn Creek and indicate erosion potential. In general, the areas of greater risk are located outside of the city to the west. *Note that even if a jurisdiction has a*

¹⁴ DOGAMI. [Open-File Report, O-16-02](#), *Landslide Susceptibility Overview Map of Oregon* (2016)

high percentage of area in a high or very high landslide exposure susceptibility zone, this does not mean there is a high risk, because risk is the intersection of hazard, and assets.

Figure CA-7 Landslide Susceptibility Exposure



Low	Landsliding unlikely. Areas classified as Landslide Density = Low (less than 7%) and areas classified as Slopes Prone to Landsliding = Low.
Moderate	Landsliding possible. Areas classified as Landslide Density = Low to Moderate (less than 17%) and areas classified as Slopes Prone to Landsliding = Moderate OR areas classified as Landslide Density = Moderate (7%-17%) and areas classified as Slopes Prone to Landsliding = Low.
High	Landsliding likely. Areas classified as Landslide Density = High (greater than 17%) and areas classified as Slopes Prone to Landsliding = Low and Moderate OR areas classified as Landslide Density = Low and Moderate (less than 17%) and areas classified as Slopes Prone to Landsliding = High.
Very High	Existing landslides Landslide Density and Slopes Prone to Landsliding data were not considered in this category. Note: the quality of landslide inventory (existing landslides) mapping varies across the state.

Source: [Oregon HazVu: Statewide Geohazards Viewer \(DOGAMI\)](#)

Note: To view detail click the link above to access Oregon HazVu

Potential landslide-related impacts are adequately described within Volume I, Section 2, and include infrastructure 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 occur during any winter, and thoroughfares beyond City limits are susceptible to obstruction as well.

The most common type of landslides 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.

Vulnerability Assessment

Due to insufficient data and resources, Carlton is currently unable to perform a quantitative risk assessment for this hazard. DOGAMI completed a statewide landslide susceptibility assessment in 2016 ([O-16-02](#)), general findings from that report are provided above and within Figure CA-7. Response and recovery efforts will likely vary from minor cleanup to more extensive utility system rebuilding. Utility disruptions are usually local and terrain dependent. Damages may require reestablishing electrical, communication, and gas pipeline connections occurring from specific breakage points. Initial debris clearing from emergency routes and high traffic areas may be required. Water and wastewater utilities may need treatment to quickly improve water quality by reducing excessive water turbidity and reestablishing waste disposal capability.

Mitigation Activities

Landslide mitigation activities listed here include current mitigation programs and activities that are being implemented by the City of Carlton agencies or organizations.

City of Carlton Codes Pertaining to Landslides

The following Carlton codes, plans, and policies pertain to landslides:

1. Carlton Comprehensive Plan, “Natural Hazards”.
2. The City of Carlton enforces the [Oregon Building Code](#) which includes provisions that address the potential of geologic hazards including landslides.

Please review Volume I, Section 2 for additional information on this hazard.

Severe Weather

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

Windstorm

The steering committee determined that the City’s probability for windstorm is **high** and that their vulnerability to windstorm is **moderate**.

Volume I, Section 2 describes the characteristics of windstorm hazards, history, 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 flooding and winter storms (ice, freezing rain, and very rarely, snow). Other severe weather events that may accompany windstorms, including thunderstorms, hail, lightning strikes, and tornadoes are generally negligible for Carlton.

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.

Damage from high winds generally has resulted in downed utility lines, and trees usually limited to several localized areas. 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 may cause localized urban flooding.

Please review Volume I, Section 2 for additional information on this hazard.

Winter Storm (Snow/Ice)

The steering committee determined that the City's probability for winter storm is **high** and that their vulnerability to winter storm is **high**.

Volume I, Section 2 describes the characteristics of winter storm hazards, history, 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.

Vulnerability Assessment

Due to insufficient data and resources, Carlton is currently unable to perform a quantitative risk assessment, or exposure analysis, for the windstorm and winter storm hazards. All areas within the City of Carlton are equally at risk of a windstorm or winter storm event.

Mitigation Activities

The City works to mitigate problems regarding windstorm and winter storm issues when they arise. Mitigation activities listed here include current mitigation programs and activities that are being implemented by Carlton agencies or organizations.

- ODOT is responsible for sanding and de-icing state managed roads including: OR 47 within city limits.
- The City requires that all new utility lines, cables or wires, on new development be placed underground.
- The City via Yamhill County provides education on winter weather preparedness
- The City encourages property owners to trim hazard trees, and to maintain trees within public rights-of-way. Utility companies maintain trees along their utility easements.

City of Carlton Codes Pertaining to Windstorms and Winter Storms

The following Carlton codes, plans, and policies pertain to windstorms and winter storms:

1. The City of Carlton Development Code provides standards for public infrastructure and utilities, including design.
2. The City of Carlton enforces the [Oregon Building Code](#) which regulates building material requirements and includes provisions for windstorms and winter storms.

Please review Volume I, Section 2 for additional information on this hazard.

Volcanic Event

The steering committee determined that the City's probability for a volcanic event is **low** and that their vulnerability to a volcanic event is **low**.

Volume I, Section 2 describes the characteristics of volcanic hazards, history, as well as the location, extent, and probability of a potential event within the region. Generally, an event that affects the Eastern portion of the County is likely to affect Carlton as well. Several volcanoes are located near Carlton, the closest of which are Mount Hood, Mount Adams, Mount Saint Helens, Mount Rainier, and the Three Sisters.

Due to Carlton'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). Although the City of Carlton is unlikely to experience lahars or lava flows, tephra (sand- sized or finer particles of volcanic rock that is ejected rapidly into the air from volcanic vents) drifts downwind from the explosions and can form a blanket-like deposit of ash. 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 heavier coating of ash. Tephra is a public health threat, and can damage agriculture and transportation systems (i.e., aircraft and on- the-ground vehicles). Tephra can also clog drainage systems and create major debris management problems. Within Carlton, public health would be a primary concern, and keeping transportation routes open/accessible would be important as well.

Vulnerability Assessment

Due to insufficient data and resources, Carlton is currently unable to perform a quantitative risk assessment, or exposure analysis, for this hazard.

Mitigation Activities

The existing volcanic event hazard mitigation activities are conducted at the county, regional, state, and federal levels and are described in the Yamhill County NHMP.

City of Carlton Codes Pertaining to Volcanic Events

The City does not have specific codes, plans, or policies that pertain to volcanic events:

Please review Volume I, Section 2 for additional information on this hazard.

Wildfire

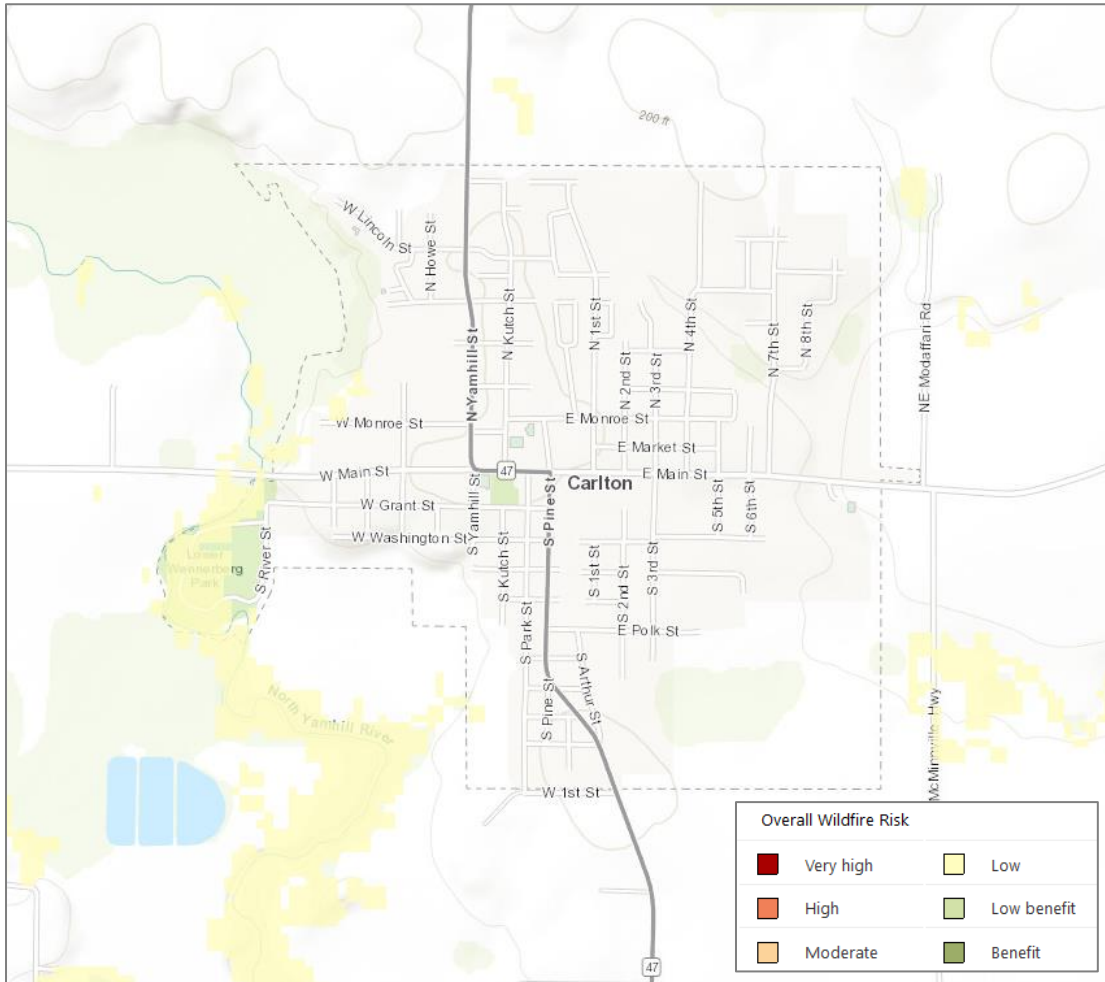
The steering committee determined that the City's probability for wildfire is **low** and that their vulnerability to wildfire is **low**.

The [Yamhill County Community Wildfire Protection Plan \(CWPP\)](#) was completed in August 2009 and revised in 2015. The CWPP is hereby incorporated into this NHMP addendum by reference, and it will serve as the wildfire section for this addendum.

Volume I, Section 2 describes the characteristics of wildland fire hazards, history, as well as the location, extent, and probability of a potential event within the region. The location, and extent of a wildland fire vary depending on fuel, topography, and weather conditions. Weather, and urbanization conditions are primarily at cause for the hazard level. Carlton has not experienced a wildfire within City limits. The city is surrounded by irrigated agricultural

land. However, some wooded areas are a concern in the case of a wildfire event. Figure CA-8 shows overall wildfire risk in Carlton.

Figure CA-8 Overall Wildfire Risk



Source: [Oregon Wildfire Risk Explorer](#), date accessed April 29, 2020.

There have been no wildfires in the City, however, several small wildfires have occurred west of the city in the regions near the city's water treatment plant and Panther Creek Reservoir. Wildland fires can be a problem in late summer to early fall and are usually caused by human activity (illegal brush burning, etc.).

The forested areas within, and surrounding Carlton are interface areas. These areas (outside of the city) are characterized by varying housing structures (often large houses on small lots, some with shake roofs), natural, and ornamental vegetation, and topography that may increase the risk for wildfire spreading (particularly to the north and northeast).

Most of the city has less severe (low to none) wildfire burn probability that includes expected flame lengths less than four feet under normal weather conditions.¹⁵ However, conditions vary widely and with local topography, fuels, and local weather (including wind)

¹⁵ [Oregon Wildfire Risk Explorer](#).

conditions. Under warm, dry, windy, and drought conditions expect higher likelihood of fire starts, higher intensity, more ember activity, and a more difficult to control wildfire that will include more fire effects and impacts.

Carlton's fire response is provided by Carlton Fire District. The CWPP assesses wildfire risk, maps wildland urban interface areas, and includes actions to mitigate wildfire risk (all identified actions are outside the city limits). However, several identified projects are located near the city or within the city's watershed including moderate priority defensible space projects at the BPA and PGE substations located to the west of the city, and a high priority survey/defensible space project for the Panther Creek Area near the city's water reservoir. The City will update the City's wildfire risk assessment if the CWPP presents better data during future updates (an action item is included to participate in future updates to the CWPP).

Vulnerability Assessment

Due to insufficient data and resources, Carlton is currently unable to perform a quantitative risk assessment for this hazard.

The potential community impacts, and vulnerabilities described in Volume I, Section 2 are generally accurate for the City as well.

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).

Exposed infrastructure including wastewater main lines, major water lines, natural gas pipeline and fiber optic lines are buried, decreasing their vulnerability to damage from wildfire hazards. However, wildfire conditions could potentially limit or delay access for the purposes of operation or repair.

Mitigation Activities

The Carlton Fire District works to mitigate problems regarding wildfire issues when they arise. Wildfire mitigation activities listed here include current mitigation programs and activities that are being implemented by Carlton agencies or organizations.

City of Carlton Codes Pertaining to Wildfires

The following Carlton codes, plans, and policies pertain to wildfires:

1. The City of Carlton Development Code provides standards for public infrastructure and utilities, including design.
2. The City of Carlton enforces the [Oregon Building Code](#) which regulates building material requirements and includes provisions for fire.

Please review the [Yamhill County Community Wildfire Protection Plan \(CWPP\)](#) and Volume I, Section 2 for additional information on this hazard.

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ATTACHMENT A: ACTION ITEM FORMS

Table CA-1 provides a summary list of 2020 NHMP Actions for the city. Each high priority action item has a corresponding action item worksheet describing the activity, identifying the rationale for the project, identifying potential ideas for implementation, and assigning coordinating and partner organizations. The action item worksheets can assist the community in pre-packaging potential projects for grant funding. The worksheet components are described below.

ALIGNMENT WITH EXISTING PLANS/POLICIES

The City NHMP includes a range of action items that, when implemented, will reduce loss from hazard events in the City. Within the plan, FEMA requires the identification of existing programs that might be used to implement these action items. The City addresses statewide planning goals and legislative requirements through its comprehensive land use plan, capital improvements plan, mandated standards and building codes. To the extent possible, the City will work to incorporate the recommended mitigation action items into existing programs and procedures. Each action item identifies related existing plans and policies.

STATUS/RATIONALE FOR PROPOSED ACTION ITEM

Action items should be fact-based and tied directly to issues or needs identified throughout the planning process. Action items can be developed at any time during the planning process and can come from several sources, including participants in the planning process, noted deficiencies in local capability, or issues identified through the risk assessment. The rationale for proposed action items is based on the information documented in this addendum and within Volume I, Section 2. The worksheet provides information on the activities that have occurred since the previous plan for each action item.

IDEAS FOR IMPLEMENTATION

The ideas for implementation offer a transition from theory to practice and serve as a starting point for this plan. This component of the action item is dynamic, since some ideas may prove to not be feasible, and new ideas may be added during the plan maintenance process. Ideas for implementation include such things as collaboration with relevant organizations, grant programs, tax incentives, human resources, education and outreach, research, and physical manipulation of buildings and infrastructure.

COORDINATING (LEAD) ORGANIZATION:

The coordinating organization is the public agency with the regulatory responsibility to address natural hazards, or that is willing and able to organize resources, find appropriate funding, or oversee activity implementation, monitoring and evaluation.

INTERNAL AND EXTERNAL PARTNERS:

The internal and external partner organizations listed in the Action Item Worksheets are potential partners recommended by the project steering committee but not necessarily contacted during the development of the plan. The coordinating organization should contact the identified partner organizations to see if they are capable of and interested in participation. This initial contact is also to gain a commitment of time and/or resources toward completion of the action items.

Internal partner organizations are departments within the City or other participating jurisdiction that may be able to assist in the implementation of action items by providing relevant resources to the coordinating organization.

External partner organizations can assist the coordinating organization in implementing the action items in various functions and may include local, regional, state, or federal agencies, as well as local and regional public and private sector organizations.

PLAN GOALS ADDRESSED:

The plan goals addressed by each action item are identified as a means for monitoring and evaluating how well the mitigation plan is achieving its goals, following implementation.

TIMELINE:

All broad scale action items have been determined to be ongoing, as opposed to short (0 to 2 years), medium (2-5 years), or long (6 or more years). This is because the action items are broad ideas, and although actions may be implemented to address the broad ideas, the efforts should be ongoing.

POTENTIAL FUNDING SOURCE

Where possible potential funding sources have been identified. Example funding sources may include: Federal Hazard Mitigation Assistance programs, state funding sources such as the Oregon Seismic Rehabilitation Grant Program, or local funding sources such as capital improvement or general funds. An action item may include several potential funding sources.

ESTIMATED COST

A rough estimate of the cost for implementing each action item is included. Costs are shown in general categories showing low, medium, or high cost. The estimated cost for each category is outlined below:

Low - Less than \$50,000

Medium - \$50,000 – \$100,000

High - More than \$100,000

Multi-Hazard #1

Proposed Action Item:		Alignment with Plan Goals:	
Develop, enhance, and implement public education and information materials concerning mitigation, preparedness and safety procedures for identified natural hazards.		Gopal 1, Goal 2, Goal 3, Goal 6, Goal 8	
Alignment with Existing Plans/Policies:			
Emergency Operations Plan, Community Wildfire Protection Plan			
2020 Status/Rationale for Proposed Action Item:			
<p>The natural hazard sections of the City's addendum (Volume II) to the Yamhill Co. NHMP and Yamhill County's risk assessment (Volume I, Section 2 and Volume III, Appendix C) identify vulnerable populations and property within the various identified hazard areas. Increasing public outreach to educate residents about their risk to natural hazards affecting their community as well as what to do in the event of a natural hazard will help decrease their vulnerability to natural hazards.</p> <p>The Disaster Mitigation Act of 2000 requires communities to identify how the community will continue to involve the public in the plan maintenance process [201.6(c)(4)(iii)]. Educating landowners on how to mitigate the effects of natural hazards helps keep the public informed of what is being done with the plan, how the City is working to mitigate its risk to natural hazards, and allows for feedback and suggestions from the public for improving, updating, and maintaining the plan.</p>			
Ideas for Implementation:			
<p>Distribution of natural hazard information describing dangers and evacuation routes for visitors to Carlton and continued educational outreach for residents and business owners.</p> <p>Update brochures with new information provided as part of reports provided by DOGAMI, ODF, DLCD, and FEMA (among others).</p> <p>Identify and use existing mechanisms for public outreach (e.g., SWCD, NRCS, watershed councils, OSU Extension, etc.).</p>			
Coordinating Organization:		Planning	
Internal Partners:		External Partners:	
Public Works, Fire District, Police, School District, Administration		DOGAMI, DLCD, FEMA, ODF	
Potential Funding Sources:		Estimated cost:	Timeline:
General fund, grants		Low	<input type="checkbox"/> Short (0-2 years) <input type="checkbox"/> Medium (2-5 years) <input type="checkbox"/> Long (6+ years) <input checked="" type="checkbox"/> Ongoing
Form Submitted by:	2019-20 NHMP Steering Committee		
Priority:	High		

Multi-Hazard #2

Proposed Action Item:		Alignment with Plan Goals:	
Cross reference and incorporate mitigation planning provisions into all community planning processes such as comprehensive, capital improvement, land use, transportation plans, etc to demonstrate multi-benefit considerations and facilitate using multiple funding source consideration.		Goal 1, Goal 4, Goal 5, Goal 6, Goal 7, Goal 8	
Alignment with Existing Plans/Policies:			
Comprehensive Plan, Development Code, Building Code			
2020 Status/Rationale for Proposed Action Item:			
<p>Comprehensive plans provide the framework for the physical design of a community. They shape overall growth and development while addressing economic, environmental and social issues. Oregon’s statewide goals are accomplished through local comprehensive plans. State Law requires local governments to adopt a comprehensive plan and the zoning and land-division ordinances needed to put the plan into action.</p> <p>Integration of NHMPs into comprehensive plans and other plans will help to reduce a community’s vulnerability to natural hazards, support in mitigation activities, help to increase the speed in which action items are implemented and therefore the speed in which communities recover from natural disasters.</p> <p>Integration of NHMPs into local plans gives the action items identified in the NHMP legal status for guiding local decision-making regarding land use and/ or capital expenditures. .</p>			
Ideas for Implementation:			
<p>Conduct a policy crosswalk of the NHMP, the comprehensive plan, and other planning documents, to identify areas of possible integration.</p> <p>Integrate natural hazards information and policies into the comprehensive plan and other plans.</p> <p>Engage in collaborative planning and integration.</p> <p>Coordinate future NHMP and comprehensive plan reviews and updates.</p>			
Coordinating Organization:		Planning	
Internal Partners:		External Partners:	
Public Works, Administration		DLCD	
Potential Funding Sources:		Estimated cost:	Timeline:
General fund, utility rates		Medium	<input type="checkbox"/> Short (0-2 years) <input checked="" type="checkbox"/> Medium (2-5 years) <input type="checkbox"/> Long (6+ years) <input type="checkbox"/> Ongoing
Form Submitted by:	2019-20 NHMP Steering Committee		
Priority:	High		

Earthquake #1

Proposed Action Item:		Alignment with Plan Goals:	
Seismically retrofit (structural and nonstructural) identified high risk critical facilities and infrastructure to meet life safety standards in order to continue operations post-earthquake.		Goal 2, Goal 3, Goal 4, Goal 6, Goal 7, Goal 8	
Alignment with Existing Plans/Policies:			
2020 Status/Rationale for Proposed Action Item:			
<p>Currently, all new facilities must comply with and meet seismic standards. If someone moves into an old building, they must upgrade to current standards.</p> <p>DOGAMI did a windshield survey of schools, fire stations, police, and city halls (2007 RVS). The focus was on action of existing buildings and information was shared with participants.</p>			
Ideas for Implementation:			
<p>Provide information to government building and school facility managers and teachers on nonstructural mitigation techniques including: securing bookcases, filing cabinets, light fixtures, and other objects that can cause injuries and block exits;</p> <p>Encourage facility managers, business owners, and teachers to refer to FEMA’s practical guidebook: Reducing the Risks of Nonstructural Earthquake Damage;</p> <p>Encourage homeowners and renters to use Is Your Home Protected from Earthquake Disaster? A Homeowner's Guide to Earthquake Retrofit (IBHS) for economic and efficient mitigation techniques;</p> <p>Use the FEMA 154 seismic evaluations generated by DOGAMI to prioritize critical and essential buildings for upgrades;</p> <p>Explore partnerships to provide retrofitting classes for homeowners, renters, building professionals, and contractors; and</p> <p>Target development located in potential fault zones or in unstable soils for intensive education and retrofitting resources.</p>			
Coordinating Organization:		Administration	
Internal Partners:		External Partners:	
Public Works, Planning, City Engineer		DOGAMI, School District, Fire District	
Potential Funding Sources:		Estimated cost:	Timeline:
General funds, utility fees, grants (SRGP, HMA)		High	<input type="checkbox"/> Short (0-2 years) <input type="checkbox"/> Medium (2-5 years) <input checked="" type="checkbox"/> Long (6+ years) <input type="checkbox"/> Ongoing
Form Submitted by:	2019-20 NHMP Steering Committee		
Priority:	High		

Flood #3

Proposed Action Item:		Alignment with Plan Goals:	
Provide flood protection to mitigate damage and contamination of wastewater treatment systems.		Goal 1, Goal 3, Goal 4, Goal 6, Goal 8	
Alignment with Existing Plans/Policies:			
Sewer Master Plan			
2020 Status/Rationale for Proposed Action Item:			
The Disaster Mitigation Act of 2000 requires communities to identify actions and projects that reduce the effects of hazards on the community [201.6(c)(3)(ii)]. Mitigating flood impacts to the wastewater treatment system will allow for continuous operation during a flood event and decrease interruptions during and after a hazard event.			
Ideas for Implementation:			
Implement improvements identified in the Sewer Master Plan.			
Coordinating Organization:		Public Works	
Internal Partners:		External Partners:	
Planning			
Potential Funding Sources:		Estimated cost:	Timeline:
General funds, HMA, utility fees		High	<input type="checkbox"/> Short (0-2 years) <input type="checkbox"/> Medium (2-5 years) <input checked="" type="checkbox"/> Long (6+ years) <input type="checkbox"/> Ongoing
Form Submitted by:	2019-20 NHMP Steering Committee		
Priority:	High		

Severe Weather #1

Proposed Action Item:		Alignment with Plan Goals:	
Develop and implement programs to coordinate maintenance and mitigation activities to reduce risk to public infrastructure from severe winter storms.		Goal 2, Goal 3, Goal 4, Goal 6, Goal 8	
Alignment with Existing Plans/Policies:			
2020 Status/Rationale for Proposed Action Item:			
<p>Currently, all new facilities and infrastructure must comply with development standards including undergrounding.</p> <p>The Disaster Mitigation Act of 2000 requires communities to identify actions and projects that reduce the effects of hazards on the community [201.6(c)(3)(ii)]. Reducing risk to public infrastructure will decrease service interruptions during and after a hazard event.</p>			
Ideas for Implementation:			
<p>Develop, implement, and maintain partnership with electric utilities to underground existing utilities where and when possible.</p> <p>Mitigate impacts to public infrastructure snow, ice, wind, and rain events.</p> <p>Consider possible incentives.</p> <p>Develop a tree clearing program to mitigate related threats to infrastructure, people, and property.</p>			
Coordinating Organization:		Public Works	
Internal Partners:		External Partners:	
Planning, Administration		Oregon Energy Trust, Pacific Power, ODOT	
Potential Funding Sources:		Estimated cost:	Timeline:
General funds, utility fees		Medium	<input type="checkbox"/> Short (0-2 years) <input type="checkbox"/> Medium (2-5 years) <input type="checkbox"/> Long (6+ years) <input checked="" type="checkbox"/> Ongoing
Form Submitted by:	2019-20 NHMP Steering Committee		
Priority:	High		

Wildfire #1

Proposed Action Item:		Alignment with Plan Goals:	
Coordinate wildfire mitigation action items through the Yamhill County Community Wildfire Protection Plan.		Goal 1, Goal 2, Goal 3, Goal 4, Goal 5, Goal 6, Goal 7, Goal 8	
Alignment with Existing Plans/Policies:			
Yamhill County Community Wildfire Protection Plan			
2020 Status/Rationale for Proposed Action Item:			
The wildfire mitigation action items provide direction on specific activities that organizations and residents in Carlton can take to reduce wildfire hazards.			
Ideas for Implementation:			
Implement high and medium priority projects including defensible space and fuels reduction projects identified in the CWPP.			
Coordinating Organization:		Carlton Fire District	
Internal Partners:		External Partners:	
Planning		ODF	
Potential Funding Sources:		Estimated cost:	Timeline:
General fund, ODF grants		Medium	<input type="checkbox"/> Short (0-2 years) <input type="checkbox"/> Medium (2-5 years) <input type="checkbox"/> Long (6+ years) <input checked="" type="checkbox"/> Ongoing
Form Submitted by:	2019-20 NHMP Steering Committee		
Priority:	High		

ATTACHMENT B: PUBLIC INVOLVEMENT SUMMARY

Members of the steering committee provided edits and updates to the NHMP prior to the public review period as reflected in the final document.

To provide the public information regarding the draft NHMP addendum, and provide an opportunity for comment, an announcement (see text below) was announced on the county's website and was discussed during the City Council work session on September 1, 2020 (it was previously noticed and provided in the Council agenda packet on August 4, 2020). Residents and adjoining jurisdictions had opportunities to comment.

During the public review period there were no comments provided.



The mission of Yamhill County Emergency Management is to provide a program that educates County residents in the Mitigation of, Preparedness for, Response to and Recovery from all hazards either natural or manmade.

Yamhill County seeks additional public input on update to Natural Hazard Mitigation Plan

(Posted July 14, 2020)

Yamhill County is currently in the process of updating their existing Natural Hazard Mitigation Plan (NHMP). This work is being performed in cooperation with the University of Oregon's Community Service Center - Oregon Partnership for Disaster Resilience and the Oregon Military Department's Office of Emergency Management utilizing funds obtained from the Federal Emergency Management Agency's (FEMA) Pre-Disaster Mitigation Grant Program. With re-adoption of the plan, Yamhill County will maintain its eligibility to apply for federal funding towards natural hazard mitigation projects. This local planning process includes a wide range of representatives from city and county government, emergency management personnel, and outreach to members of the public in the form of an electronic survey. This NHMP also affects the cities of Amity, Carlton, Dayton, McMinnville, Newberg, Sheridan, Willamina, and Yamhill.

A natural hazard mitigation plan provides communities with a set of goals, action items, and resources designed to reduce risk from future natural disaster events. Engaging in mitigation activities provides jurisdictions with a number of benefits, including reduced loss of life, property, essential services, critical facilities, and economic hardship; reduced short-term and long-term recovery and reconstruction costs; increased cooperation and communication within the community through the planning process; and increased potential for state and federal funding for recovery and reconstruction projects.

The electronic draft is available [here](#); to submit any comments or questions you have regarding the draft plan, please email Brian Young, Yamhill County Emergency Manager emergencymanagement@co.yamhill.or.us

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City of Dayton Addendum to the Yamhill County Multi-Jurisdictional Hazard Mitigation Plan



Effective: December 22, 2020 through December 21, 2025



Prepared for:

City of Dayton

Prepared by:

**University of Oregon
Institute for Policy Research and Engagement
Oregon Partnership for Disaster Resilience**

Planning grant funding provided by:



FEMA

Federal Emergency Management Agency (FEMA)
Pre-Disaster Mitigation Program
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Disaster Award Number: 97.039

and

Additional Support Provided by:



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FEMA

January 20, 2021

The Honorable Casey Kulla
Chair Kulla, Yamhill County Board of Commissioners
535 NE 5th St.
McMinnville, Oregon 97128

Dear Chair Kulla:

On December 22, 2020, the U.S. Department of Homeland Security's Federal Emergency Management Agency (FEMA) Region 10, approved the Yamhill County Hazard Mitigation Plan as a multi-jurisdictional local plan as outlined in Code of Federal Regulations Title 44 Part 201. This approval provides the below jurisdictions eligibility to apply for the Robert T. Stafford Disaster Relief and Emergency Assistance Act's, Hazard Mitigation Assistance grants projects through December 21, 2025, through your state:

Yamhill County	City of Amity	City of Carlton	City of Dayton
City of McMinnville	City of Newberg	City of Sheridan	City of Yamhill

FEMA individually evaluates all application requests for funding according to the specific eligibility requirements of the applicable program. Though a specific mitigation activity or project identified in the plan may meet the eligibility requirements, it may not automatically receive approval for FEMA funding under any of the aforementioned programs.

Approved mitigation plans may be eligible for points under the National Flood Insurance Program's Community Rating System (CRS). For additional information regarding the CRS, please visit: www.fema.gov/national-flood-insurance-program-community-rating-system or contact your local floodplain manager. Over the next five years, we encourage your communities to follow the plan's schedule for monitoring and updating, and to develop further mitigation actions. To continue eligibility, jurisdictions must review, revise as appropriate, and resubmit the plan within five years of the original approval date.

If you have questions regarding your plan's approval or FEMA's mitigation grant programs, please contact Joseph Murray, Planner with Oregon Office of Emergency Management, at (503) 378-2911, who locally coordinates and administers these efforts.

Sincerely,

Kristen Meyers, Director
Mitigation Division

Enclosure

cc: Amie Bashant, Oregon Office of Emergency Management

EG:vl

RESOLUTION No. 2020/21-04
City of Dayton, Oregon

A Resolution Adopting the City of Dayton Representation in the Updates to the Yamhill County Multi-Jurisdictional Natural Hazards Mitigation Plan

WHEREAS, the City of Dayton recognizes the threat that natural hazards pose to people, property and infrastructure within our community; and

WHEREAS, undertaking hazard mitigation actions will reduce the potential for harm to people, property and infrastructure from future hazard occurrences; and

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

WHEREAS, the City of Dayton has fully participated in the FEMA prescribed mitigation planning process to prepare the Yamhill County, Multi-Jurisdictional Natural Hazard Mitigation Plan, which has established a comprehensive, coordinated planning process to eliminate or minimize these vulnerabilities; and

WHEREAS, the City of Dayton has identified natural hazard risks and prioritized a number of proposed actions and programs needed to mitigate the vulnerabilities of the City of Dayton to the impacts of future disasters within the Yamhill County, Multi-Jurisdictional Natural Hazard Mitigation Plan; and

WHEREAS, these proposed projects and programs have been incorporated into the Yamhill County, Multi-Jurisdictional Natural Hazard Mitigation Plan that has been prepared and promulgated for consideration and implementation by the cities of Yamhill County; and

WHEREAS, the Oregon Office of Emergency Management and Federal Emergency Management Agency, Region X officials have reviewed the City of Dayton addendum to the Yamhill County Multi-Jurisdictional Natural Hazard Mitigation Plan and pre-approved it (dated, July 23, 2020) contingent upon this official adoption of the participating governments and entities;

WHEREAS, the NHMP is comprised of comprised of three volumes: Volume I: Basic Plan, Volume II: Jurisdictional Addenda, and Volume III: Appendices, collectively referred to herein as the NHMP; and

WHEREAS, the NHMP is in an on-going cycle of development and revision to improve its effectiveness; and

WHEREAS, City of Dayton adopts the NHMP and directs the City Manager to develop, approve, and implement the mitigation strategies and any administrative changes to the NHMP.

Therefore, the City of Dayton resolves as follows:

- 1) **THAT** the City of Dayton adopts the Yamhill County Multi-Jurisdictional Natural Hazards Mitigation Plan as an official plan; and

- 2) **THAT** the City of Dayton will submit this Adoption Resolution to the Oregon Office of Emergency Management and Federal Emergency Management Agency, Region X officials to enable final approval of the Yamhill County Multi-Jurisdictional Natural Hazards Mitigation Plan.
- 3) **THAT** this resolution shall become effective immediately upon adoption.

ADOPTED this 8th day of September 2020.

In Favor: Collins, Holbrook, Mackin, Price, Sandoval-Perez, Wytoski

Opposed: None

Absent: Marquez

Abstained: None


Elizabeth Wytoski, Mayor


Date Signed

ATTEST:


Patty Ringnalda, City Recorder


Date of Enactment

Purpose

This is an update of the Dayton addendum to the Yamhill County Multi-Jurisdictional Natural Hazard Mitigation Plan (NHMP). This addendum supplements information contained in Volume I (Basic Plan) which serves as the NHMP foundation, and Volume III (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 Dayton's addendum are further discussed throughout the NHMP, and within Volume III, Appendix B, which provides an overview of alterations to the document that took place during the update process.

Dayton adopted their addendum to the Yamhill County Multi-jurisdictional NHMP on **September 8, 2020**. FEMA Region X approved the Yamhill County NHMP and the City's addendum on **December 22, 2020**. With approval of this NHMP the City is now eligible to apply for the Robert T. Stafford Disaster Relief and Emergency Assistance Act's hazard mitigation project grants through **December 21, 2025**.

Mitigation Plan Mission

The NHMP mission states the purpose and defines the primary functions of the 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 City concurs with the mission statement developed during the Yamhill County planning process (Volume I, Section 3):

To promote public policy and mitigation activities which will enhance the safety to life and property from natural hazards.

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

Mitigation Plan Goals

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

The City concurs with the goals developed during the Yamhill County planning process (Volume I, Section 3). All NHMP goals are important and are listed below in no 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.

Below is a list of the NHMP goals:

GOAL 1: EMERGENCY OPERATIONS

- Coordinate natural hazard mitigation activities, where appropriate, with emergency operations plans and procedures and with other agencies.

GOAL 2: EDUCATION AND OUTREACH

- Develop and implement education and outreach programs to increase public awareness of the risks associated with natural hazards.

GOAL 3: PARTNERSHIPS

- Develop effective partnerships with public and private sector organizations and significant agencies and businesses for future natural hazard mitigation efforts.
- Coordinate natural hazard mitigation actions between the County and local jurisdictions to create more cohesive and effective hazard mitigation efforts.

GOAL 4: PREVENTIVE

- Develop and implement activities to protect human life, commerce, and property from natural hazards.
- Reduce losses and repetitive damage for chronic hazard events while promoting insurance coverage for catastrophic hazards.

GOAL 5: NATURAL RESOURCES UTILIZATION

- Link natural resources management, land use planning, and watershed planning with natural hazard mitigation activities to protect natural systems and allow them to serve natural hazard mitigation functions.

GOAL 6: IMPLEMENTATION

- Implement strategies to mitigate the effects of natural hazards and increase the quality of life and resilience of economies in Yamhill County.

GOAL 7: DEVELOPMENT

- Communities appropriately apply development standards that consider the potential impacts of natural hazards.

GOAL 8: DOCUMENTATION

- Document and evaluate progress in achieving hazard mitigation strategies and action items.

Process and Participation

This section of the NHMP addendum addresses 44 CFR 201.6(a)(3), *Participation*.

In addition to establishing a comprehensive community-level mitigation strategy, the Disaster Mitigation Act of 2000 (DMA2K), and the regulations contained in 44 CFR 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 pre-, and post-disaster mitigation project grants.

The Oregon Partnership for Disaster Resilience (OPDR) at the University of Oregon's Institute for Policy Research and Engagement (IPRE) collaborated with the Oregon Office of Emergency Management (OEM), Yamhill County, and Dayton to update their NHMP. This project is funded through the Federal Emergency Management Agency's (FEMA) Hazard Mitigation Grant Program for DR-4328 (HMGP-DR-4328-OR-5-P). Members of the Dayton NHMP Steering committee also participated in the County NHMP update process (Volume III, Appendix B).

The Yamhill County NHMP, and Dayton addendum, are the result of a collaborative effort between citizens, public agencies, non-profit organizations, the private sector, and regional organizations. The Dayton NHMP Steering Committee guided the process of developing the NHMP.

Convener and Committee

The Dayton City Manager serves as the NHMP addendum convener. The convener of the NHMP will take the lead in implementing, maintaining, and updating the addendum to the Yamhill County NHMP in collaboration with the designated convener of the Yamhill County NHMP (Yamhill County Emergency Manager).

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

This addendum reflects decisions made at the designated meetings, and during subsequent work, and communication with Yamhill County Emergency Manager, and 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, action items, and community profile.

The Dayton steering committee was comprised of the following representatives:

- Convener, Rochelle Roaden, City Manager
- Steve Sagmiller, Public Works Director

Public Participation

Public participation was achieved by posting the NHMP publicly and providing community members the opportunity to make comments and suggestions during the review process. Community members were also provided an opportunity for comment via a survey administered by IPRE (Volume III, Appendix F). During the City public review period (Attachment B) there were no comments provided.

Implementation and Maintenance

The City Council will be responsible for adopting the Dayton addendum to the Yamhill County NHMP. This addendum designates the 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 Dayton 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 Manager 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; 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 City will utilize the same action item prioritization process as the County (Volume I, Section 4).

Implementation through Existing Programs

This NHMP is strategic and non-regulatory in nature, meaning that it does not necessarily set forth any new policy. It does, however, provide: (1) a foundation for coordination and collaboration among agencies and the public in the city; (2) identification and prioritization of future mitigation activities; and (3) aid in meeting federal planning requirements and qualifying for assistance programs. The mitigation plan works in conjunction with other city plans and programs including the Comprehensive Land Use Plan, Capital Improvements Plan, and Building Codes, as well as the [Yamhill County NHMP](#), and the [State of Oregon NHMP](#).

The mitigation actions described herein (and priority actions in Attachment A) 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, Dayton 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. Implementation opportunities are further defined in action items when applicable.

Future development without proper planning may result in worsening problems associated with natural hazards. Dayton's acknowledged comprehensive plan is the City of Dayton Comprehensive Plan. The City implements the plan through the Community Development Code.

Dayton currently has the following plans that relate to natural hazard mitigation. For a complete list visit the City's [website](#):

- Comprehensive Plan
- [Dayton Municipal Code](#)
 - Chapter 4 Building Codes
 - Chapter 6 Public Improvements
 - Chapter 7 Land Use and Development Code
 - Chapter 7.2.113 Flood Plain Overlay District
 - Chapter 8 Utilities
- Building Code, [2017 Oregon State Building Code](#) based on 2015 International Residential Code (IRC), and 2012 International Building Code (*to be updated to the 2020 Oregon State Building Code, anticipated October 2020*)
- [Parks and Recreation Master Plan](#)
- [Wastewater System Facilities Plan](#) (2012)
- [Water System Master Plan](#)

Other plans:

- [Yamhill County Community Wildfire Protection Plan](#) (2009, revised Nov. 2015)

Government Structure

The Dayton City Charter establishes a Mayor-Council-Manager form of government, which vests policy authority in a volunteer City Council, and administrative authority for day-to-day operations in an appointed, professional City Manager. The Dayton City Council consists of a Mayor and six Councilors who serve four-year terms. The Council meets at least once per month at City Hall. The agenda of each meeting includes time for citizen comment.

The City of Dayton currently has the following departments which have a role in natural hazard mitigation:

Administration services are provided by the City Manager and includes strategic planning, budget and finance, and development of public policy recommendations to the City Council.

Public Works provides many of the basic urban services to the citizens of Dayton, including operating and maintaining the City's buildings, parks, streets, stormwater system, wastewater system, and water system. The City has a public works director and four paid maintenance staff.

Building services are provided through a contract with the City of Newberg and include plan review and inspections on commercial, industrial and residential developments. City Engineer services are provided through a contract with Westech Engineering, Inc.

Planning services are provided through a contract with the Mid-Willamette Valley Council of Government and includes all long range and current planning for new development, as well as the City's flood plain management zone. Planning is also responsible for implementation of the Comprehensive Plan.

Police services are provided through a contract with Yamhill County Sheriff's Office. In addition to law enforcement activities police services include emergency management (emergency preparedness, mitigation, response and recovery efforts for Dayton during emergencies, disasters, or disruptions).

Fire protection services are provided through a contract with Dayton Fire District which includes emergency response to more than 5,000 residents (including city residents) over 80 square miles. The main fire station is in Dayton. Emergency services include fire suppression and fire protection, the district has two sub-stations and provide service for Grand Island and Hopewell.

Emergency Management coordinates emergency preparedness, mitigation, response and recovery efforts for Dayton during emergencies, disasters, or disruptions through a contract with Yamhill County.

Continued Public Participation

An open public involvement process is essential to the development of an effective NHMP. To develop a comprehensive approach to reducing the effects of natural disasters, the planning process shall include opportunities for the public, neighboring communities, local, and regional agencies, as well as, private, and non-profit entities to comment on the NHMP during review.¹ Keeping the public informed of efforts to reduce its risk to future natural hazard events is important for successful NHMP implementation, and maintenance. As such, the City is committed to involving the public in the NHMP review and update process (Volume I, Section 4). The City posted the plan update for public comment before FEMA approval, and after approval will maintain the plan on the City's website:

<https://www.ci.dayton.or.us/page/homepage>

NHMP Maintenance

The Yamhill County NHMP, and City addendum will be updated every five years in accordance with the update schedule outlined in the Disaster Mitigation Act of 2000. During the County NHMP update process, the City will also review, and update its addendum (Volume I, Section 4). The convener will be responsible for convening the steering committee to address the questions outlined below.

- Are there new partners that should be brought to the table?
- Are there new local, regional, state or federal policies influencing natural hazards that should be addressed?

¹ Code of Federal Regulations, Chapter 44. Section 201.6, subsection (b). 2015

- Has the community successfully implemented any mitigation activities since the NHMP was last updated?
- Have new issues or problems related to hazards been identified in the community?
- Are the actions still appropriate given current resources?
- Have there been any changes in development patterns that could influence the effects of hazards?
- Have there been any significant changes in the community's demographics that could influence the effects of hazards?
- Are there new studies or data available that would enhance the risk assessment?
- Has the community been affected by any disasters? Did the NHMP accurately address the impacts of this event?

These questions will help the steering committee determine what components of the mitigation plan need updating. The steering committee will be responsible for updating any deficiencies found in the NHMP.

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) were first developed during the 2009 NHMP planning process and revised during subsequent NHMP updates. During these processes, the steering committee assessed the City's risk, identified potential issues, and developed a mitigation strategy (action items).

During the 2019-2020 update process the City re-evaluated their mitigation strategy (action items). During this process action items were updated, noting what accomplishments had been made, and whether the actions were still relevant; any new action items were identified at this time (see Volume III, Appendix B for more information on changes to action items).

Priority Action Items

Table DA-1 presents a list of mitigation actions. The steering committee 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 in **bold** text with grey 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 steering committee in terms of implementation, the steering committee 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 detailed information for each high priority action. Full text of the plan goals referenced in Table DA-1 is located on page DA-2.

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Table DA-I Dayton Action Items

Natural Hazard Action ID	Action Item	Coordinating Organization (Lead)	Partners	Potential Funding	Cost	Timing	Plan Goals Addressed							
							Goal 1	Goal 2	Goal 3	Goal 4	Goal 5	Goal 6	Goal 7	Goal 8
Multi-Hazard Actions														
Multi-Hazard #1	Develop, enhance, and implement public education and information materials concerning mitigation, preparedness and safety procedures for identified natural hazards.	Administration, Fire District	City Council	General fund, grants	L	Ongoing	✓	✓	✓			✓	✓	
Multi-Hazard #2	Incorporate Natural Hazard Mitigation Plan actions and goals into regulatory documents, e.g., Comprehensive Plan and the zoning code, and in existing plans, policies, or programs in the county that address natural hazards.	Planning	Administration	General funds, DLCDC TA	L	Medium	✓			✓	✓	✓	✓	
Multi-Hazard #3	Identify critical facilities, especially fire and police departments, without emergency power and encourage these facilities to secure emergency power to mitigate power outage events due to natural hazard events. Consider solar battery options due to PGE policy changes during fire risk. Consider outreach to private property owners.	Administration, Fire District	School District	General fund, utility rates, grants	H	Short	✓		✓		✓	✓	✓	
Multi-Hazard #4	Plan for solar + battery storage systems, which can serve as mini power-supply stations or provide residents the ability to shelter in place after any electricity supply-disrupting event, at varying scales (project, neighborhood and district) and locations (critical City facilities, low-	Public Works	Administration, School District	General fund, grants, private investment	H	Long	✓		✓	✓	✓	✓	✓	

Natural Hazard Action ID	Action Item	Coordinating Organization (Lead)	Partners	Potential Funding	Cost	Timing	Plan Goals Addressed											
							Goal 1	Goal 2	Goal 3	Goal 4	Goal 5	Goal 6	Goal 7	Goal 8				
	income housing, community gathering spots).																	
Multi-Hazard #5	Replace Footbridge (utility bridge with pedestrian access) that carries water/sewer lines across the Yamhill River.	Community Development	Public Works	General fund, HMA, utility rates	H	Long		✓	✓	✓			✓	✓	✓			
Drought Actions																		
<i>No actions Identified at this time</i>																		
Earthquake Actions																		
Earthquake #1	Conduct seismic strength evaluations of critical facilities and infrastructure to identify vulnerabilities and seismically retrofit (structural and nonstructural) identified critical facilities and infrastructure to meet life safety standards in order to continue operations post-earthquake.	Administration	School District, Fire District, Planning, Public Works	General funds, utility fees, grants, SRGP	H	Long		✓	✓	✓			✓	✓	✓			
Flood Actions																		
Flood #1	Ensure continued compliance in the National Flood Insurance Program (NFIP) through enforcement of local floodplain management ordinances.	Planning	Administration, Public Works	General fund	L	Ongoing	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Flood #2	Install new streamflow and rainfall measuring gauges to better inform community and emergency responders of flood risks.	Public Works	Administration	General fund	L	Medium	✓		✓	✓			✓					✓

Natural Hazard Action ID	Action Item	Coordinating Organization (Lead)	Partners	Potential Funding	Cost	Timing	Plan Goals Addressed							
							Goal 1	Goal 2	Goal 3	Goal 4	Goal 5	Goal 6	Goal 7	Goal 8
Flood #3	Inventory culverts in need of modification to increase culvert size to increase its drainage efficiency.	Public Works	Administration	General fund, HMA	L	Short	✓		✓	✓		✓		✓
Flood #4	Develop and maintain GIS mapped critical facility inventory for all structures and residential and commercial buildings located within 100-year and 500-year floodplains.	Planning	Public Works, Administration	General fund	L	Short	✓		✓	✓		✓		✓
Flood #5	Establish flood mitigation priorities for critical facilities and residential and commercial buildings located within the 100- year floodplain using survey elevation data.	Public Works	Planning, Administration	General fund	L	Long			✓	✓		✓		✓
Landslide Actions														
Landslide #1	Use DOGAMI landslide risk maps to improve public knowledge of landslide hazard areas and understanding of vulnerability and risk to life and property in hazard-prone areas in the city.	Planning	DOGAMI, Administration, Emergency Management	General fund	L	Short	✓	✓	✓			✓		✓
Landslide #2	Regulate development in erosion prone areas through the comprehensive plan and zoning ordinances	Planning	Administration	General fund	L	Ongoing		✓		✓	✓	✓	✓	✓
Landslide #3	Continue outreach program to educate the public concerning planting processes and materials used to stabilize hill slopes or stream banks. This is known as bio-engineering; which uses logs, root wads, or wood debris or other vegetation to reduce	Administration	Watershed Council	General fund	L	Ongoing	✓	✓	✓		✓			✓

Natural Hazard Action ID	Action Item	Coordinating Organization (Lead)	Partners	Potential Funding	Cost	Timing	Plan Goals Addressed										
							Goal 1	Goal 2	Goal 3	Goal 4	Goal 5	Goal 6	Goal 7	Goal 8			
	scour and erosion. (Partnership with watershed council)																
Landslide #4	Maintain erosion protection by city park at city sewer outfall header	Public Works	Administration	General fund	L	Ongoing			✓	✓	✓	✓					✓
Landslide #5	Coordinate with county to protect county park boat landing	Public Works	Administration	General fund	L	Medium			✓	✓	✓	✓					✓
Severe Weather Actions (Windstorm and Winter Storms – Snow/Ice)																	
Severe Weather #1	Develop and implement programs to coordinate maintenance and mitigation activities to reduce risk to public infrastructure from severe winter storms.	Public Works	Administration, Planning	General fund, grants, utility rates	M	Ongoing	✓	✓	✓				✓				✓
Severe Weather #2	Review critical facilities and government building energy efficiency, winter readiness, and electrical protection capability. Identify, prioritize, and implement infrastructure upgrade or rehabilitation project prioritization and development.	Public Works	Administration	General fund	L	Medium	✓		✓				✓				✓
Severe Weather #3	Coordinate with County debris management plans.	Public Works	Administration	General fund	L	Ongoing	✓	✓	✓				✓				✓
Severe Weather #4	Continue tree clearing mitigation programs to keep trees from threatening lives, property, and public infrastructure from severe weather events.	Public Works	Administration	General fund	M	Ongoing	✓	✓	✓	✓	✓						✓
Severe Weather #5	Maintain partnership program with electrical utilities to use underground utility placement methods where possible to reduce or eliminate power outages in new development from severe winter storms. Consider developing incentive programs.	Public Works	Administration, Planning	General fund	L	Ongoing	✓		✓	✓			✓				✓

Natural Hazard Action ID	Action Item	Coordinating Organization (Lead)	Partners	Potential Funding	Cost	Timing	Plan Goals Addressed							
							Goal 1	Goal 2	Goal 3	Goal 4	Goal 5	Goal 6	Goal 7	Goal 8
Volcanic Event Actions														
Volcanic Event #1	Update public emergency notification procedures and develop an outreach program for ash fall events.	Public Works	Administration	General fund	L	Long				✓	✓	✓	✓	
Wildfire Actions														
Wildfire #1	Coordinate wildfire mitigation action items through the Yamhill County Community Wildfire Protection Plan.	Fire District	Community Development	General fund, ODF, grants	M	Ongoing	✓	✓	✓	✓	✓	✓	✓	
Wildfire #2	Develop, adopt, and enforce burn ordinances that require burn permits, restricts campfires, and controls outdoor burning.	Planning, Fire District	Administration	General fund	L	Long		✓	✓	✓	✓	✓	✓	
Wildfire #3	Conduct regular fuel-reduction projects throughout wildfire hazard-prone areas in the city.	Fire District, Administration	Planning, Public Works	General fund	M	Short		✓	✓	✓	✓	✓	✓	

Source: City of Dayton steering committee, 2020.

Note: Full text of the plan goals referenced in this table is located on page DA-2.

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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, Section 2, and Volume III, Appendix C. The risk assessment process is graphically depicted in Figure DA-1. Ultimately, the goal of hazard mitigation is to reduce the area of risk, where hazards overlap vulnerable systems.

Figure DA-1 Understanding Risk



Hazard Analysis

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

Table DA-2 shows the HVA matrix for Dayton 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 sense of hazard priorities but does not predict the occurrence of a hazard.

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

Table DA-2 Hazard Analysis Matrix

Hazard	Maximum				Total Threat Score	Hazard Rank	Hazard Tiers
	History	Vulnerability	Threat	Probability			
Winter Storm	16	40	80	56	192	#1	Top Tier
Earthquake - Cascadia	6	45	100	35	186	#2	
Windstorm	16	25	70	56	167	#3	
Flood	18	25	50	63	156	#4	Middle Tier
Drought	10	25	50	56	141	#5	
Earthquake - Crustal	6	20	60	21	107	#6	
Wildfire	8	15	50	21	94	#7	Bottom Tier
Landslide	6	15	30	21	72	#8	
Volcanic Event	4	10	30	7	51	#9	

Source: Dayton steering committee, 2019-2020.

Table DA-3 categorizes the probability, and vulnerability scores from the hazard analysis for the City and compares the results to the assessment completed by the Yamhill County steering committee. Variations between the City, and County are noted in **bold** text within the city ratings.

Table DA-3 Probability and Vulnerability Comparison

Hazard	Dayton		Yamhill County	
	Probability	Vulnerability	Probability	Vulnerability
Drought	High	Moderate	High	Moderate
Earthquake - Cascadia	Moderate	High	Moderate	High
Earthquake - Crustal	Low	Moderate	Low	Moderate
Flood	High	Moderate	High	High
Landslide	Low	Low	High	Low
Volcanic Event	Low	Low	Low	Low
Wildfire	Low	Low	Low	Low
Windstorm	High	Moderate	High	Moderate
Winter Storm	High	High	High	High

Source: Dayton and Yamhill County steering committee, 2019-2020.

Community Characteristics

Table DA-4 and the following section provides information on City specific demographics, and assets. 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. Between 2012 and 2019 the City grew by 205 people (8%).² According to the State's official coordinated population forecast, between 2019 and 2040 the City's population is forecast to grow by 20% to 3,290.³ *Note: the State is currently updating the official forecast and the proposed 2040 population is 3,364 which represents a 23% increase from 2019 population.*⁴ Median household income increased by 13% between 2012 and 2017.⁵

There have been three housing developments since the previous plan that are either completed or underway: a nine (9) home subdivision in 2017, a 16-home subdivision (currently in development on Ferry St between 8th and 9th), and a proposed 12 lot affordable housing development. New development has complied with the standards of the [Oregon Building Code](#), and the city's development code including their floodplain ordinance.

Economy

The City of Dayton is in the eastern portion of Yamhill County, its northeastern city limit is the Yamhill River. Dayton's commercial areas developed along primary routes (Ferry St and 3rd St), and residential development followed nearby (see Figure DA-2).

Most workers residing in the city (95%, 1,217 people) travel outside of the city for work primarily to McMinnville, Newberg, Portland Metro area, and Salem.⁶

Dayton residents are employed in a variety of occupations including professional (17%), management, business, and financial operations (11%), office and administrative support (11%), production (10%), construction, extraction, and maintenance (10%), and transportation and material moving (9%) occupations.⁷

The largest employers in the city are the Dayton School District, Baker Rock, C&D Landscaping and Gray & Company.

² Portland State University, Population Research Center, "Annual Population Estimates", 2019.

³ Portland State University, Population Research Center, "Oregon Population Forecast Program Cycle 1 (2014-2017)". 2017.

⁴ Portland State University, Population Research Center, "Oregon Population Forecast Program Cycle 2 (2018-2020)". 2020 (proposed).

⁵ Social Explorer, Table T57, U.S. Census Bureau, 2013-2017 and 2008-2012 American Community Survey Estimates.

⁶ U.S. Census Bureau. LEHD Origin-Destination Employment Statistics (2002-2017). Longitudinal-Employer Household Dynamics Program, accessed on April 25, 2020 at <https://onthemap.ces.census.gov>.

⁷ Social Explorer, Table A17008, U.S. Census Bureau, 2013-2017 American Community Survey Estimates.

Table DA-4 Community Characteristics

Population Characteristics		
2012 Population	2,535	
2019 Population	2,740	
2040 Forecasted Pop. [Proposed]*	3,290 [3,364]	
Race (non-hispanic) and Ethnicity (Hispanic)		
White	55%	
Black/ African American	< 1%	
American Indian and Alaska Native	< 1%	
Asian	1%	
Native Hawaiian and Other Pacific Islander	0%	
Some Other Race	0%	
Two or More Races	4%	
Hispanic or Latino	40%	
Limited or No English Spoken	7%	
Vulnerable Age Groups		
Less than 15 Years	798	31%
65 Years and Over	282	11%
Disability Status		
Total Population	329	13%
Children	57	6%
Seniors	116	41%
Income Characteristics		
Households by Income Category		
Less than \$15,000	76	10%
\$15,000-\$29,999	98	13%
\$30,000-\$44,999	122	16%
\$45,000-\$59,999	134	18%
\$60,000-\$74,999	71	10%
\$75,000-\$99,999	128	17%
\$100,000-\$199,999	103	14%
\$200,000 or more	16	2%
Median Household Income	\$54,265	
Poverty Rates		
Total Population	411	16%
Children	218	24%
Seniors	162	12%
Housing Cost Burden		
Owners with Mortgage	130	24%
Renters	106	51%

Source: U.S. Census Bureau, 2013-2017 American Community Survey; Portland State University, Population Research Center, "Annual Population Estimates", 2019. Portland State University, Population Research Center, "Oregon Population Forecast Program Cycle 1 (2014-2017)". 2017. and "Oregon Population Forecast Program Cycle 2 (2018-2020)". 2020 (proposed).

Housing Characteristics		
Housing Units		
Single-Family	656	82%
Multi-Family	61	8%
Mobile Homes	84	10%
Year Structure Built		
Pre-1970	216	27%
1970-1989	194	24%
1990-2009	384	48%
2010 or later	7	1%
Housing Tenure and Vacancy		
Owner-occupied	541	68%
Renter-occupied	207	26%
Seasonal	0	0%
Vacant	53	7%

Dayton is in eastern portion of Yamhill County, approximately seven (7) miles east of McMinnville. The Willamette River is to the east of the city and there are three drainage basins within the city: Yamhill River, Palmer Creek, and an unnamed creek in the northwestern portion of the city that becomes an overflow side channel of the Yamhill River during flood events. Dayton is generally flat and its soils are moderately well-drained silt loams primarily of the Amity and Dayton series. The area that is not urbanized is cultivated or comprised of grass, scattered Oak, and Douglas Fir.

Dayton's temperatures range from a monthly average low of 34-38°F in the winter months to average highs of 75-83°F in the summer months. The coolest months are December-February and the warmest months are July and August. The average annual precipitation is about 42 inches and approximately 80% falls between November and April.

The City has an educated population with 79% of residents 25 years, and older holding a high school degree, 18% have a bachelor's degree or higher. The Dayton School District has a 94% graduation rate as of 2019. Dayton includes industrial and commercial development but is zoned primarily residential.

Figure DA-2 Oregon Transportation Map: City of Dayton



Source: Oregon Department of Transportation

Community Assets

This section outlines the resources, facilities, and infrastructure that, if damaged, could significantly impact the public safety, economic conditions, and environmental integrity of Dayton.

Critical facilities and infrastructure are those that support government and first responders' ability to act in an emergency. They are a top priority in any comprehensive hazard mitigation plan. These include locally designated shelters and other essential assets, such as fire stations, and water and wastewater treatment facilities (see Table DA-5). **Essential facilities and infrastructure** are those that support the continued delivery of key government services, and/or that may significantly impact the public's ability to recover from the emergency. These facilities may include: City buildings and other public facilities such as schools.

It is important to note that the facilities identified as "critical" and "essential" are characterized differently than the structural code that identifies buildings as "essential" and "non-essential." The structural code uses different language and criteria and therefore have completely different meanings than the buildings identified in this addendum.

Table DA-5 Critical and Essential Facilities

Facility Name	Address	
Government		
<i>See Table DA-6 for information on seismic vulnerability.</i>		
City Hall/Library	416 Ferry St	Critical
Community Center (City Hall Annex) / Palmer Creek Lodge	606 4 th St	Essential
Public Works Shop	416 Ferry St	Essential
US Post Office	530 Ferry St	Essential
Water Treatment Facility	1209 Ferry St	Critical
Sewer Lagoons #1-5	SE Kreder Rd & Yamhill River	Essential
Emergency Response		
Dayton Fire District Station	500 7 th St	Critical
Sheriff Sub-Station (City Hall Annex)	606 4 th St	
Educational (Public)		
Dayton SD 8 (Admin Office)	780 Ferry St	Essential
Dayton Grade School	526 Ferry St	Essential
Dayton Junior High School	801 Ferry St	Essential
Dayton High School	801 Ferry St	Essential
Educational (Private/Charter/Montessori, etc.)		
Dayton Head Start	528 Ferry St	Essential

Transportation/Infrastructure

Mobility plays an important role in Dayton, and the daily experience of its residents, and businesses. Motor vehicles represent the dominant mode of travel through, and within Dayton. Dayton is served by Yamhill County Transit, Oregon POINT, among other transit providers.

Infrastructure that provides critical and essential services include:

Railroads

There is no freight or passenger rail service in the city.

Airports

The city has no commercial service airport, however, the McMinnville Municipal Airport is 3.5 miles west of the city along the Salmon River Hwy (OR 18)/SE Dayton Bypass. The Portland International Airport (PDX), the largest and busiest airport in the state, is in nearby Multnomah County.

Roads/Seismic lifelines

Oregon 18 (Salmon River Highway) is the major east-west transportation route through the city. The Amity-Dayton Hwy (OR 233), and the Salem-Dayton Highway (OR 221) are also major transit routes (see Figure DA-2).

Seismic lifeline routes help maintain transportation facilities for public safety and resilience in the case of natural disasters. Following a major earthquake, it is important for response and recovery agencies to know which roadways are most prepared for a major seismic event. The Oregon Department of Transportation has identified lifeline routes to provide a secure lifeline network of streets, highways, and bridges to facilitate emergency services response after a disaster.⁸

System connectivity and key geographical features were used to identify a three-tiered seismic lifeline system. Routes identified as Tier 1 are considered the most significant and necessary to ensure a functioning statewide transportation network. The Tier 2 system provides additional connectivity to the Tier 1 system, it allows for direct access to more locations and increased traffic volume capacity. The Tier 3 lifeline routes provide additional connectivity to the systems provided by Tiers 1 and 2.

The Lifeline Routes in Dayton:

- Tier I: None
- Tier II: None
- Tier III: None

Bridges

Because of earthquake risk, the seismic vulnerability of the city's bridges is an important issue. Non-functional bridges can disrupt emergency operations, sever lifelines, and disrupt

⁸ Oregon Department of Transportation. Oregon Seismic Lifeline Evaluation, Vulnerability Synthesis, and Identification, *Oregon Seismic Lifeline Routes*, May 15 2012. Page 6-4 figure 6-1. Accessed September 12, 2019.

local and freight traffic. These disruptions may exacerbate local economic losses if industries are unable to transport goods. Bridges within the city that are critical or essential include:

- Ferry St Footbridge (over the Yamhill River; water and sewer lines run underneath)
- Yamhill River, Hwy 39 (OR 18) bridge (ODOT 08003)
- Hwy 39 (OR 18) over Hwy 150 (OR 221) (ODOT 08013)
- Palmer Creek, Hwy 150 (OR 221) bridge (ODOT 01470A)

Utility Lifelines

Utility lifelines are the resources that the public relies on daily such as, electricity, fuel and communication lines. If these lines fail or are disrupted, the essential functions of the community can become severely impaired. Utility lifelines are closely related to physical infrastructures, like dams and power plants, as they transmit the power generated from these facilities.

Generally, the network of electricity transmission lines running throughout the city is operated by Portland General Electric. The Williams Gas Pipeline provides natural gas that is delivered to customers in the city by Northwest Natural Gas. These lines may be vulnerable as infrequent natural hazards, like earthquakes, could disrupt service to natural gas consumers across the region.

The city water and wastewater systems include the following:

- Breyman Watershed
- Water Reservoirs:
 - Concrete Reservoir (165,000 gallons)
 - Steel Reservoir (600,000 gallons)
 - Enclosed water tank (1.5 million gallons)
- Lift Station #1 (4th and 9th St)
- Lift station #2 (Hwy 221 and Wall St)
- Lift station #3 (Footbridge and Ferry St)(rebuilt September 2019)
- Lift station #4 (Palmer Creek and Sweeney St)
- 8 Community potable water wells
- Sewer treatment lagoons (SE Kreder Rd & Yamhill River)
- Water treatment plant (1209 Ferry St)

Environmental Assets/Parks:

Environmental assets are those parks, green spaces, wetlands, and rivers that provide an aesthetic, and functional ecosystem services for the community include:

Alderman Park & Off-Leash Area
Courthouse Square Park
Legion Field

Andrew Smith Park
Palmer Creek Trail
Dayton Landing (County Park)

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:

Child Care Facilities

None registered.

Adult Care Facilities

None registered.

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 Dayton 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. The following historic resources can be found in the City:

Community Center/Palmer Creek Lodge	Gabriel – Filer Residence (525 Church St)
Court House Square Park	Curtis W Powell Residence (524 Ash St)
Fort Yamhill Blockhouse	Rippey Residence (523 Ash Street)
Gabriel-Will Residence (401 3 rd St)	Morse House (101 5th Street)
Baptist Church (301 Main St)	Monahan Residence (120 5th Street)
Nichols Residence (303 Main St)	Free Methodist Church (411 Oak Street)
Londershausen (Paul) Residence (309 Main St)	Robert Morris Residence (409 Oak St)
Fisher Butcher Shop (400 Ferry Street)	Fletcher-Stretch Residence (401 Oak St)
Dayton Common School (506 4th Street)	Methodist Episcopal Parsonage (202 4th St)
Brookside Cemetery (3rd & Mill Streets)	Avery Residence (403 Church Street)
Cain House (208 Alder Street)	Methodist Episcopal Church (302 4th St)
Foster Oil Company (216 Ferry Street)	Gottlieb Londershausen Residence (402 Main St)
Harris Building (302 Ferry Street)	Samuel Sigler Residence (521 Ferry St)
Commercial Club SC Stuckey Building (304 Ferry Street)	Lewis – Shippy Residence (421 6th St)
Dayton Post Office (308 Ferry Street)	Jessen–Goodrich Residence (324 6th St)
William Hibbert Residence (426 5th St)	Bonome Residence (700 Church Street)
James Mellinger Residence (414 5th St)	Mabee–Mayberry Residence (309 7th St)
Smith - Jones Residence (308 5th Street)	Dayton High School (801 Ferry Street)
Evangelical United Brethren Church (302 5th Street)	Hole Residence (623 Ferry Street)
John Baxter Residence (407 Church St)	Joel Palmer House (600 Ferry Street)
Carter - Goodrich Residence (521 Church Street)	Mellinger - Ponnay House (102 Tribbett Court)

Hazard Characteristics

Drought

The steering committee determined that the City's probability for drought is **high**, and that their vulnerability to drought is **moderate**.

Volume I, Section 2 describes the characteristics of drought hazards, history, as well as the location, extent, and probability of a potential event. The spring/summer of 2018 was particularly dry period for the City. Due to the climate of Yamhill County, past, and present weather conditions have shown an increasing potential for drought.

The City of Dayton owns and operates a water treatment facility and a well field (jointly used by Dayton and Lafayette through an intergovernmental agreement) that support 26% of the water supply for the City. The existing water capacity allows for a minimum of 216 million gallons per day (MGD) to a maximum of 888 MGD via two (2) water transmission mains (one 8-inch diameter main is suspended from a city owned decommissioned footbridge over the Yamhill River to the east of the city).

The city has three reservoirs with a combined capacity of about 2.265 million gallons (MG):

- Main Reservoir (1.5 MG) Ferry Street
- Steel Reservoir (.600 MG) Breyman Watershed
- Concrete Reservoir (.165 MG) Breyman Watershed

For more information on Dayton's water supply visit their website:

https://www.ci.dayton.or.us/page/water_home

Vulnerability Assessment

Due to insufficient data and resources, Dayton is currently unable to perform a quantitative risk assessment, or exposure analysis, for this hazard. State-wide 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 apply to humans and resources. Industries important to the City of Dayton's local economy such as agriculture, fishing, and timber have historically been affected, and any future droughts would have tangible economic and potentially human impacts.

The city's existing water supply is vulnerable to flooding during the winter wet season. The city's water mains are vulnerable to seismic activity that could cause them to crack or impact the pedestrian footbridge over the Yamhill River.

Mitigation Activities

The City provides information on water conservation to Dayton water customers. The city also offers a \$50 utility credit (per household) for customers who show proof of water saving devices (dishwashers, clothes washers, and 1.28 gallons per flush toilets). The City engages in other water conservation measures including water line leak detection and repair, replacement of deteriorating pipe, and replacement/repair of older and under-registering water meters and reducing dead end lines in order to increase water circulation throughout the system.

Dayton Codes Pertaining to Droughts

The following Dayton codes, plans, and policies pertain to droughts:

1. Dayton Comprehensive Plan
2. Dayton Municipal Code Chapter 8.2, *Water Curtailment*

Please review Volume I, Section 2 for additional information on this hazard.

Earthquake (Cascadia Subduction Zone)

The steering committee determined that the City's probability for a Cascadia Subduction Zone (CSZ) earthquake is **moderate** and that their vulnerability to a CSZ earthquake is **high**.

Volume I, Section 2 describes the characteristics of earthquake hazards, history, as well as the location, extent, and probability of a potential event. Generally, an event that affects the County is likely to affect Dayton as well. The causes, and characteristics of an earthquake event are appropriately described within the 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 Dayton as well.

Within the Northern Willamette Valley are that includes Yamhill County, two potential faults and/or zones can generate high-magnitude earthquakes. These include the Cascadia Subduction Zone and the Gales Creek-Newberg-Mt. Angel Structural Zone (including the Newberg Fault).

Cascadia Subduction Zone

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 approximately 1700 A.D.⁹

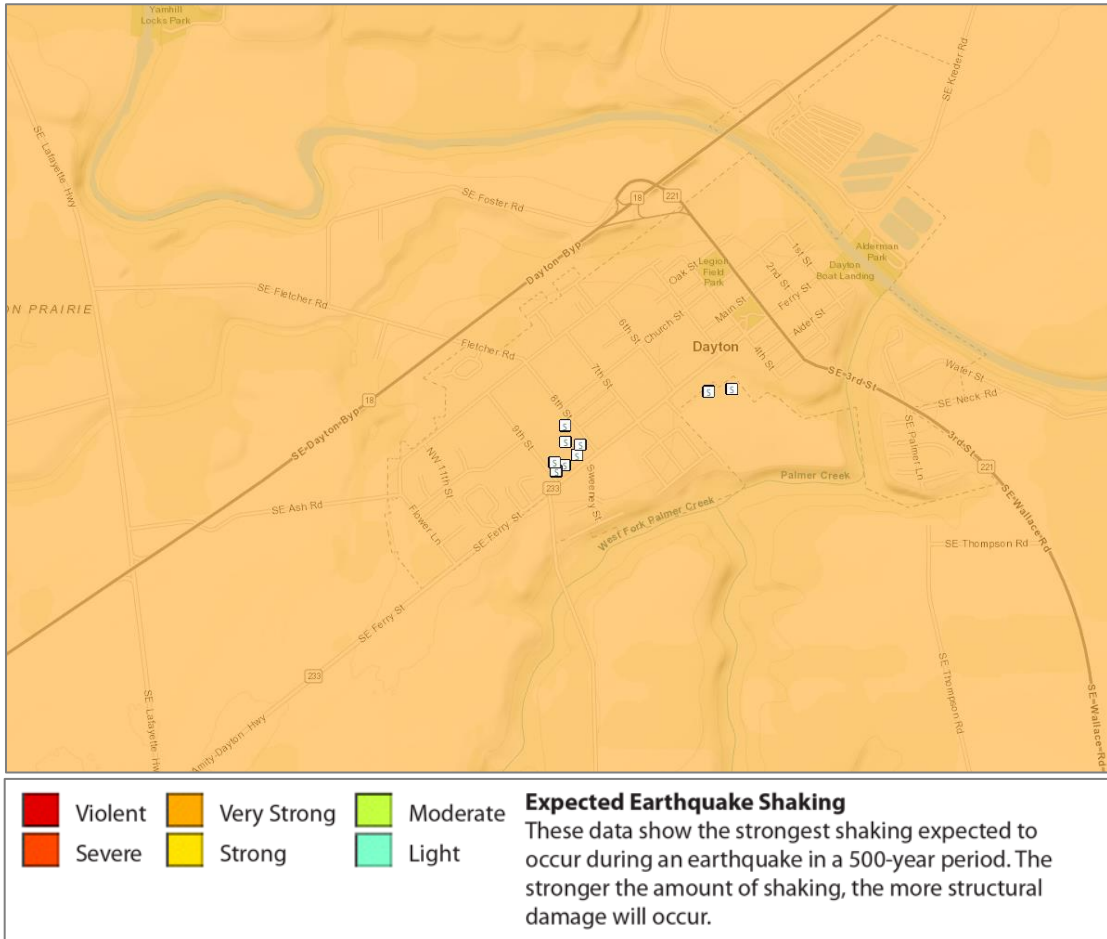
Figure DA-3 displays relative shaking hazards from a Cascadia Subduction Zone earthquake event. As shown in the figure, most of the City is expected to experience very strong (orange) shaking in a CSZ event.

The city'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 City 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 Dayton within the "Valley Zone" (Valley Zone, from the summit of the Coast Range to the summit of the Cascades). Within the Northwest Oregon region, damage, and shaking is expected to be

⁹ The Cascadia Region Earthquake Workgroup, 2005. Cascadia Subduction Zone Earthquakes: A magnitude 9.0 earthquake scenario. <http://www.crew.org/PDFs/CREWSubductionZoneSmall.pdf>

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.

Figure DA-3 Cascadia Subduction Zone Expected Shaking



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

Earthquake (Crustal)

The steering committee determined that the City’s probability for a crustal earthquake is **low** and that their vulnerability to crustal earthquake is **moderate**.

Volume I, Section 2 describes the characteristics of earthquake hazards, history (see below), as well as the location, extent, and probability of a potential event. Generally, an event that affects the County is likely to affect Dayton 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 Dayton as well.

Figure DA-4 shows a generalized geologic map of the Dayton area that includes the areas for potential regional active faults, earthquake history (1971-2008), and soft soils (liquefaction) hazard. The figure shows the areas of greatest concern within the City limits as red and orange and shows the Newberg Fault.

Vulnerability Assessment (subduction zone and crustal)

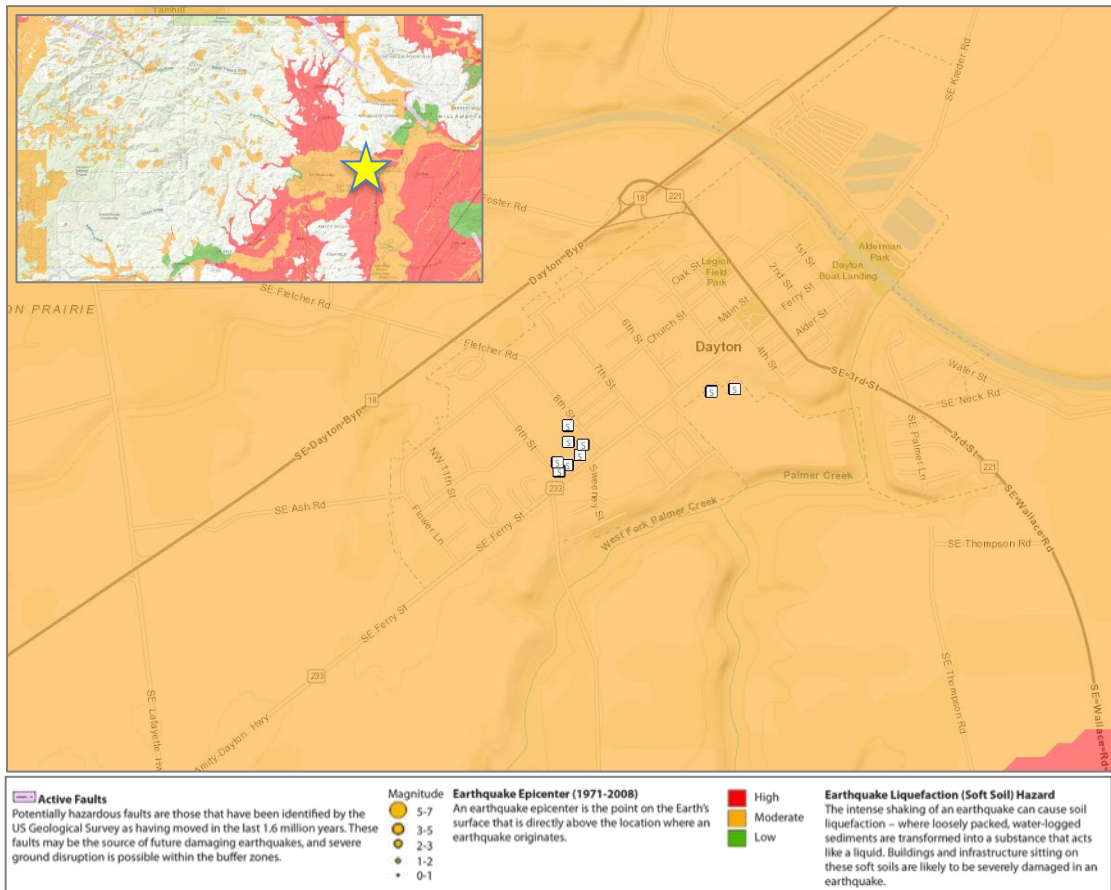
Due to insufficient data and resources, Dayton is currently unable to perform a quantitative risk assessment for this hazard.

The western portion of Yamhill County is likely to experience higher levels of shaking than the eastern portion, as a result of its proximity to the Cascadia Subduction Zone.

The City of Dayton is in the eastern portion of Yamhill County, in a region likely to experience strong shaking should a subduction zone or significant crustal earthquake occur. This rating represents the peak acceleration of the ground caused by the earthquake, and for a strong designation corresponds to 9-20 percent of the acceleration of gravity.

Ground movement in both areas, however, is likely to cause damage to weak, unreinforced masonry buildings, and to induce small landslides along unstable slopes. As well as landslide, earthquakes can trigger other hazards such as dam failure and disruption of transportation and utility systems.

Figure DA-4 Active Crustal Faults, Epicenters (1971-2008), and Soft Soils



Source: [Oregon HazVu: Statewide Geohazards Viewer \(DOGAMI\)](#)

Note: To view detail click the link above to access Oregon HazVu.

Utility systems will be significantly damaged, including damaged buildings, and damage to utility infrastructure, including water 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. 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.

Building codes were implemented in Oregon in the 1970s, however, stricter standards did not take effect until 1991 and early 2000s. As noted in the community characteristics section (Table DA-4), approximately 51% of residential buildings were built prior to 1990, which increases the City’s vulnerability to the earthquake hazard. Information on specific public buildings’ (schools and public safety) estimated seismic resistance, determined by DOGAMI in 2007, is shown in Table DA-6; each “X” represents one building within that ranking category. Of the facilities evaluated by DOGAMI using their Rapid Visual Survey (RVS), none have a very high (100% chance) collapse potential, however, four (4) school buildings have a high (greater than 10% chance) collapse potential.

Table DA-6 Rapid Visual Survey Scores

Facility	Site ID*	Level of Collapse Potential			
		Low (<1%)	Moderate (>1%)	High (>10%)	Very High (100%)
Schools					
Dayton Grade School (526 Ferry St)	Yamh_sc301	SRGP 2017-19 Phase II: \$2,499,570			
Dayton Junior High School (801 Ferry St)	Yamh_sch25	X,X			
Dayton High School (801 Ferry St)	Yamh_sch01	X	X	X,X,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 Yamhill County Map](#)

Mitigation Activities

Earthquake mitigation activities listed here include current mitigation programs and activities that are being implemented by Dayton agencies or organizations.

A primary mitigation objective is to construct or upgrade critical and essential facilities and infrastructure to withstand future earthquake events. Seismic retrofit grant awards per the [Seismic Rehabilitation Grant Program](#)¹⁰ have been funded to retrofit the Dayton Grade School (2017-19, Phase II, grant award, \$2,499,570).

The City of Dayton website refers to the Yamhill County [Community Emergency Response Team](#) (CERT) program that trains members in mitigation as well as preparedness and response. The City’s Emergency Management Program works with community groups, businesses, residential facilities, and public and private schools in promoting earthquake preparedness and mitigation.

¹⁰ 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.

Dayton Codes Pertaining to Earthquakes

The following Dayton codes, plans, and policies pertain to earthquakes:

1. Dayton Comprehensive Plan.
2. The City of Dayton enforces the [Oregon Building Code](#) which includes provisions for earthquakes.

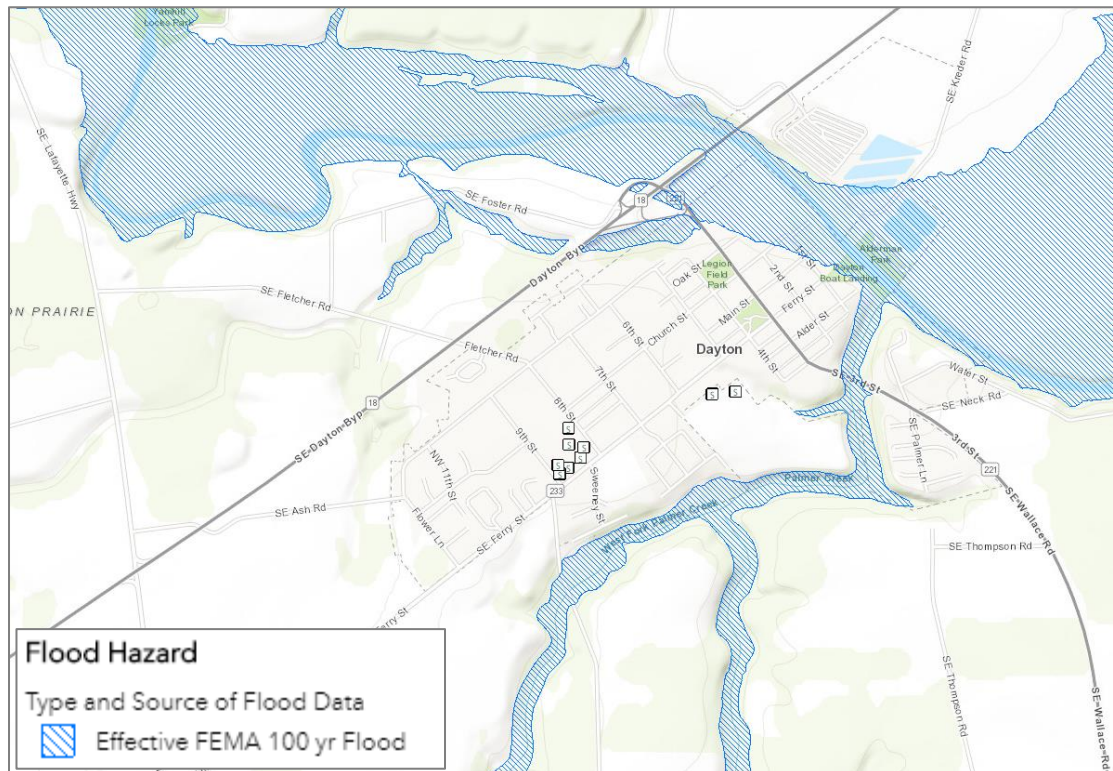
Please review Volume I, Section 2 for additional information on this hazard.

Flood

The steering committee determined that the City's probability for flood is **high** and that their vulnerability to flood is **moderate**.

Volume I, Section 2 describes the characteristics of flood hazards, history, as well as the location, extent, and probability of a potential event. Portions of Dayton have areas of floodplains (special flood hazard areas, SFHA). These include areas include along the Yamhill River, Palmer Creek, and an unnamed creek that becomes an overflow side channel for the Yamhill River during some flood events (Figure DA-5). The Willamette River is approximately one mile southeast of the city limits.

Figure DA-5 Special Flood Hazard Area- update



Source: [Oregon HazVu: Statewide Geohazards Viewer \(DOGAMI\)](#)

Note: To view detail click the link above to access Oregon HazVu.

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 Dayton

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.

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. Business owners, and their employees are significantly impacted by flood events. Direct damages from flooding are the most common impacts, but indirect damages, such as diminished clientele, can be just as debilitating to a business.

Vulnerability Assessment

Due to insufficient data and resources, Dayton is currently unable to perform a quantitative risk assessment for this hazard. FEMA FIRMs were used to outline the 100-year and 500-year floodplains for the City of Dayton. The 100-year floodplain delineates an area of high risk, while the 500-year floodplain delineates an area of moderate risk. Commercial, industrial, and residential development is largely on higher ground outside of the special flood hazard area (SFHS). At the eastern edge of the city several residential properties, two city sewer lagoons, and a commercial rock operation are within the mapped special flood hazard area of the Yamhill River. Localized flooding can occur due to various factors including blocked stream channels or storm drains.

National Flood Insurance Program (NFIP)

FEMA's Flood Insurance Study (FIS), and Flood Insurance Rate Maps (FIRMs) are effective as of March 2, 2010. Table DA-7 shows that as of August 2019, Dayton has three (3) National Flood Insurance Program (NFIP) policies in force. Of those, none are for property that was constructed before the initial FIRMs. Dayton has not had a Community Assistance Visit (CAV) and does not participate in the Community Rating System (CRS). The table shows that all flood insurance policies are for residential structures, all single-family homes. There have been no paid flood insurance claims. The City complies with the NFIP through enforcement of their flood damage prevention ordinance and their floodplain management program.

The Community Repetitive Loss record for Dayton identifies no Repetitive Loss Properties¹¹ or Severe Repetitive Loss Properties¹².

¹¹ 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.

¹² 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.

Table DA-7 Flood Insurance Detail

	Yamhill County	Dayton
Effective FIRM and FIS	3/2/2010	3/2/2010
Initial FIRM Date	-	6/1/1982
Total Policies	446	3
Pre-FIRM Policies	153	0
Policies by Building Type		
Single Family	401	3
2 to 4 Family	14	0
Other Residential	10	0
Non-Residential	21	0
Minus Rated A Zone	72	0
Insurance in Force	\$100,617,300	\$613,900
Total Paid Claims	81	0
Pre-FIRM Claims Paid	68	0
Substantial Damage Claims	3	0
Total Paid Amount	\$1,166,076	\$0
Repetitive Loss Structures	4	0
Severe Repetitive Loss Properties	1	0
CRS Class Rating	-	NP
Last Community Assistance Visit	-	NA

Source: Department of Land Conservation and Development, August 2019. Repetitive Flood Loss information provided by FEMA correspondence on September 10, 2020.
NP = Not Participating, NA = Not Available

Mitigation Activities

Flood mitigation activities listed here include current mitigation programs and activities that are being implemented by Dayton agencies or organizations.

Dayton Codes Pertaining to Flooding

The following Dayton codes, plans, and policies pertain to flooding:

1. Dayton Comprehensive Plan.
2. Dayton Municipal Code Chapter 7.2.113 *Flood Plain Overlay District*. This portion of the Community Development Code implements the Goal 7 policies of the Comprehensive Plan and regulates development within the floodplain.

Please review Volume I, Section 2 for additional information on this hazard.

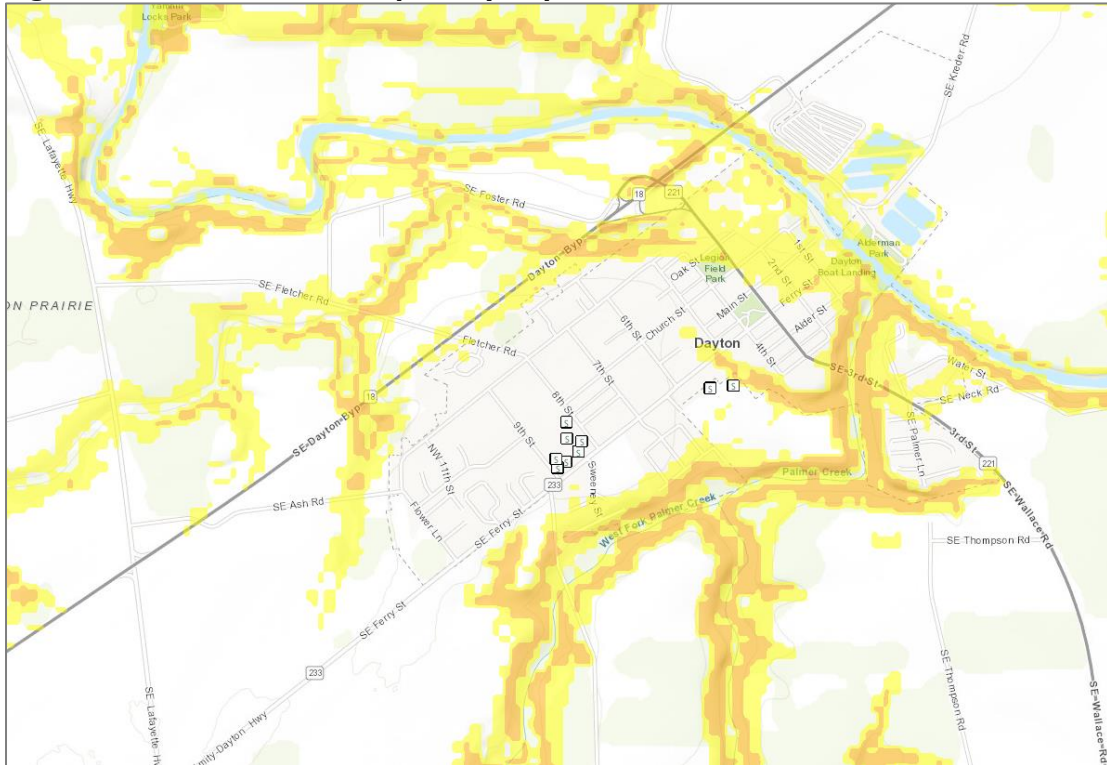
Landslide

The steering committee determined that the City's probability for landslide is **low** and that their vulnerability to landslide is **low**.

Volume I, Section 2 describes the characteristics of landslide hazards, history, as well as the location, extent, and probability of a potential event within the region.

Landslide susceptibility exposure for Dayton is shown in Figure DA-6. Approximately 10% of Dayton has very high or high, and approximately 19% moderate, landslide susceptibility exposure.¹³ In general, the areas of greater risk are located adjacent to rivers and creeks and indicate potential areas of erosions. *Note that even if a jurisdiction has a high percentage of area in a high or very high landslide exposure susceptibility zone, this does not mean there is a high risk, because risk is the intersection of hazard, and assets.*

Figure DA-6 Landslide Susceptibility Exposure



Low	Landsliding unlikely. Areas classified as Landslide Density = Low (less than 7%) and areas classified as Slopes Prone to Landsliding = Low.
Moderate	Landsliding possible. Areas classified as Landslide Density = Low to Moderate (less than 17%) and areas classified as Slopes Prone to Landsliding = Moderate OR areas classified as Landslide Density = Moderate (7%-17%) and areas classified as Slopes Prone to Landsliding = Low.
High	Landsliding likely. Areas classified as Landslide Density = High (greater than 17%) and areas classified as Slopes Prone to Landsliding = Low and Moderate OR areas classified as Landslide Density = Low and Moderate (less than 17%) and areas classified as Slopes Prone to Landsliding = High.
Very High	Existing landslides Landslide Density and Slopes Prone to Landsliding data were not considered in this category. Note: the quality of landslide inventory (existing landslides) mapping varies across the state.

Source: [Oregon HazVu: Statewide Geohazards Viewer \(DOGAMI\)](#)

Note: To view detail click the link above to access Oregon HazVu

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

¹³ DOGAMI. [Open-File Report, O-16-02, Landslide Susceptibility Overview Map of Oregon](#) (2016)

and debris flows can potentially occur during any winter, and thoroughfares beyond City limits are susceptible to obstruction as well.

The most common type of landslides 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.

Vulnerability Assessment

Due to insufficient data and resources, Dayton is currently unable to perform a quantitative risk assessment for this hazard. DOGAMI completed a statewide landslide susceptibility assessment in 2016 ([O-16-02](#)), general findings from that report are provided above and within Figure DA-6. Response and recovery efforts will likely vary from minor cleanup to more extensive utility system rebuilding. Utility disruptions are usually local and terrain dependent. Damages may require reestablishing electrical, communication, and gas pipeline connections occurring from specific breakage points. Initial debris clearing from emergency routes and high traffic areas may be required. Water and wastewater utilities may need treatment to quickly improve water quality by reducing excessive water turbidity and reestablishing waste disposal capability.

Mitigation Activities

Landslide mitigation activities listed here include current mitigation programs and activities that are being implemented by the City of Dayton agencies or organizations.

City of Dayton Codes Pertaining to Landslides

The following Dayton codes, plans, and policies pertain to landslides:

1. Dayton Comprehensive Plan.
3. The City of Dayton enforces the [Oregon Building Code](#) which includes provisions that address the potential for geologic hazards including landslides.

Please review Volume I, Section 2 for additional information on this hazard.

Severe Weather

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

Windstorm

The steering committee determined that the City's probability for windstorm is **high** and that their vulnerability to windstorm is **moderate**.

Volume I, Section 2 describes the characteristics of windstorm hazards, history, 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 flooding and winter storms (ice, freezing rain, and very rarely, snow). Other severe weather events that may accompany windstorms, including thunderstorms, hail, lightning strikes, and tornadoes are generally negligible for Dayton.

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.

Damage from high winds generally has resulted in downed utility lines, and trees usually limited to several localized areas. 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 may cause localized urban flooding.

Please review Volume I, Section 2 for additional information on this hazard.

Winter Storm (Snow/Ice)

The steering committee determined that the City's probability for winter storm is **high** and that their vulnerability to winter storm is **high**.

Volume I, Section 2 describes the characteristics of winter storm hazards, history, 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.

Vulnerability Assessment

Due to insufficient data and resources, Dayton is currently unable to perform a quantitative risk assessment, or exposure analysis, for the windstorm and winter storm hazards. All areas within the City of Dayton are equally at risk of a windstorm or winter storm event.

Mitigation Activities

The City works to mitigate problems regarding windstorm and winter storm issues when they arise. Mitigation activities listed here include current mitigation programs and activities that are being implemented by Dayton agencies or organizations.

- ODOT is responsible for sanding and de-icing state managed roads including: OR 99W within city limits.
- The City requires that all new utility lines, cables or wires, on new development be placed underground.
- The City provides education on winter weather preparedness
- The City encourages property owners to trim hazard trees, and to maintain trees within public rights-of-way. Utility companies maintain trees along their utility easements.

City of Dayton Codes Pertaining to Windstorms and Winter Storms

The following Dayton codes, plans, and policies pertain to windstorms and winter storms:

1. The City of Dayton Municipal Code Chapter 8 provides standards for public infrastructure and utilities.
2. The City of Dayton enforces the [Oregon Building Code](#) which regulates building material requirements and includes provisions for windstorms and winter storms.

Please review Volume I, Section 2 for additional information on this hazard.

Volcanic Event

The steering committee determined that the City's probability for a volcanic event is **low** and that their vulnerability to a volcanic event is **low**.

Volume I, Section 2 describes the characteristics of volcanic hazards, history, as well as the location, extent, and probability of a potential event within the region. Generally, an event that affects the Eastern portion of the County is likely to affect Dayton as well. Several volcanoes are located near Dayton, the closest of which are Mount Hood, Mount Adams, Mount Saint Helens, Mount Rainier, and the Three Sisters.

Due to Dayton'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). Although the City of Dayton is unlikely to experience lahars or lava flows, tephra (sand- sized or finer particles of volcanic rock that is ejected rapidly into the air from volcanic vents) drifts downwind from the explosions and can form a blanket-like deposit of ash. 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 heavier coating of ash. Tephra is a public health threat, and can damage agriculture and transportation systems (i.e., aircraft and on- the-ground vehicles). Tephra can also clog drainage systems and create major debris management problems. Within Dayton, public health would be a primary concern, and keeping transportation routes open/accessible would be important as well.

Vulnerability Assessment

Due to insufficient data and resources, Dayton is currently unable to perform a quantitative risk assessment, or exposure analysis, for this hazard.

Mitigation Activities

The existing volcanic event hazard mitigation activities are conducted at the county, regional, state, and federal levels and are described in the Yamhill County NHMP.

City of Dayton Codes Pertaining to Volcanic Events

The City does not have specific codes, plans, or policies that pertain to volcanic events:

Please review Volume I, Section 2 for additional information on this hazard.

Wildfire

The steering committee determined that the City's probability for wildfire is **low** and that their vulnerability to wildfire is **low**.

The [Yamhill County Community Wildfire Protection Plan \(CWPP\)](#) was completed in August 2009 and revised in 2015. The CWPP is hereby incorporated into this NHMP addendum by reference, and it will serve as the wildfire section for this addendum.

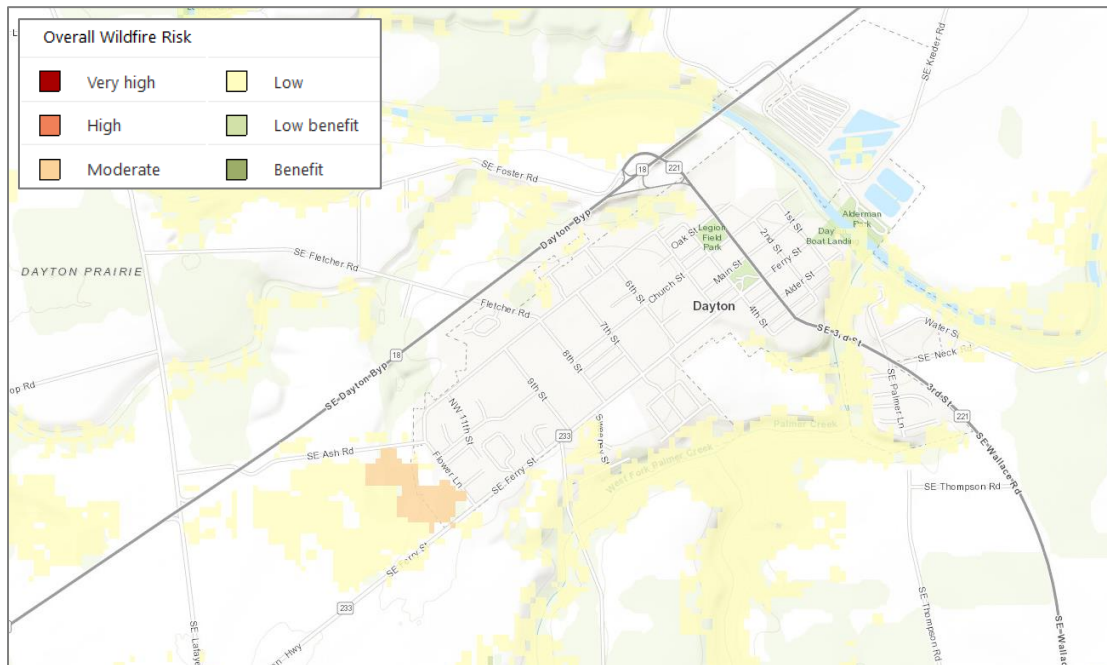
Volume I, Section 2 describes the characteristics of wildland fire hazards, history, as well as the location, extent, and probability of a potential event within the region. The location, and extent of a wildland fire vary depending on fuel, topography, and weather conditions. Weather, and urbanization conditions are primarily at cause for the hazard level. Dayton has not experienced a wildfire within City limits. The city is surrounded by developed land,

rivers, and/or irrigated agricultural land. However, some wooded areas are a concern in the case of a wildfire event. Figure DA-7 shows overall wildfire risk in Dayton.

The forested areas within, and surrounding Dayton are interface areas. These areas are characterized by varying housing structures (often large houses on small lots, some with shake roofs), natural, and ornamental vegetation, and topography that may increase the risk for wildfire spreading (particularly to the north and northeast).

Most of the city has less severe (low) wildfire burn probability that includes expected flame lengths less than four feet under normal weather conditions.¹⁴ However, conditions vary widely and with local topography, fuels, and local weather (including wind) conditions. Under warm, dry, windy, and drought conditions expect higher likelihood of fire starts, higher intensity, more ember activity, and a more difficult to control wildfire that will include more fire effects and impacts. The potential community impacts, and vulnerabilities described in Volume I, Section 2 are generally accurate for the City as well. Dayton’s fire response is provided by the Dayton Fire District. The CWPP assesses wildfire risk, maps wildland urban interface areas, and includes actions to mitigate wildfire risk (all identified actions are outside the city limits). The City will update the City’s wildfire risk assessment if the CWPP presents better data during future updates (an action item is included to participate in future updates to the CWPP).

Figure DA-7 Overall Wildfire Risk



Source: [Oregon Wildfire Risk Explorer](#), date accessed April 25, 2020.

Vulnerability Assessment

Due to insufficient data and resources, Dayton is currently unable to perform a quantitative risk assessment for this hazard.

¹⁴ [Oregon Wildfire Risk Explorer](#),

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).

Exposed infrastructure including wastewater main lines, major water lines, natural gas pipeline and fiber optic lines are buried, decreasing their vulnerability to damage from wildfire hazards. However, wildfire conditions could potentially limit or delay access for the purposes of operation or repair.

Mitigation Activities

The Dayton Fire District works to mitigate problems regarding wildfire issues when they arise. Wildfire mitigation activities listed here include current mitigation programs and activities that are being implemented by Dayton agencies or organizations.

City of Dayton Codes Pertaining to Wildfires

The following Dayton codes, plans, and policies pertain to wildfires:

1. The City of Dayton Municipal Code Chapter 8 provides standards for public infrastructure and utilities.
2. The City of Dayton enforces the [Oregon Building Code](#) which regulates building material requirements and includes provisions for fires.

Please review the [Yamhill County Community Wildfire Protection Plan \(CWPP\)](#) and Volume I, Section 2 for additional information on this hazard.

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ATTACHMENT A: ACTION ITEM FORMS

In the previous plan the City identified three high priority action items. These actions are those the city considered during the 2015-2020 Implementation and Maintenance period and they are listed in Table DA-8 along with their status.

Table DA-8 2015 High Priority Action Item Status

2014 Priority Action ID	Status (2020 Action ID) (Complete, Deferred, Deleted, Ongoing)	Comment	Description
Action #1	Ongoing (Multi-hazard #5)/ (Earthquake #1)	Lack of funding and capacity	Evaluate and harden public infrastructure crossing bridges or rivers
Action #2	Ongoing (Multi-hazard #3)	Description modified.	Develop and maintain severe winter storm public outreach program defining mitigation activity benefits through educational outreach aimed at households and businesses while targeting special needs populations.
Action #3	Ongoing (Multi-hazard #3)	Critical facilities identified. Some generators still needed.	Identify and prioritize all "jurisdiction- owned" and "non-jurisdiction owned" critical facilities that have backup power and emergency operations plans.

Table DA-1 provides a summary list of 2020 NHMP Actions for the city. Each high priority action item has a corresponding action item worksheet describing the activity, identifying the rationale for the project, identifying potential ideas for implementation, and assigning coordinating and partner organizations. The action item worksheets can assist the community in pre-packaging potential projects for grant funding. The worksheet components are described below.

ALIGNMENT WITH EXISTING PLANS/POLICIES

The City NHMP includes a range of action items that, when implemented, will reduce loss from hazard events in the City. Within the plan, FEMA requires the identification of existing programs that might be used to implement these action items. The City addresses statewide planning goals and legislative requirements through its comprehensive land use plan, capital improvements plan, mandated standards and building codes. To the extent possible, the City will work to incorporate the recommended mitigation action items into existing programs and procedures. Each action item identifies related existing plans and policies.

STATUS/RATIONALE FOR PROPOSED ACTION ITEM

Action items should be fact-based and tied directly to issues or needs identified throughout the planning process. Action items can be developed at any time during the planning process and can come from several sources, including participants in the planning process, noted deficiencies in local capability, or issues identified through the risk assessment. The rationale for proposed action items is based on the information documented in this addendum and within Volume I, Section 2. The worksheet provides information on the activities that have occurred since the previous plan for each action item.

IDEAS FOR IMPLEMENTATION

The ideas for implementation offer a transition from theory to practice and serve as a starting point for this plan. This component of the action item is dynamic, since some ideas may prove to not be feasible, and new ideas may be added during the plan maintenance process. Ideas for implementation include such things as collaboration with relevant organizations, grant programs, tax incentives, human resources, education and outreach, research, and physical manipulation of buildings and infrastructure.

COORDINATING (LEAD) ORGANIZATION:

The coordinating organization is the public agency with the regulatory responsibility to address natural hazards, or that is willing and able to organize resources, find appropriate funding, or oversee activity implementation, monitoring and evaluation.

INTERNAL AND EXTERNAL PARTNERS:

The internal and external partner organizations listed in the Action Item Worksheets are potential partners recommended by the project steering committee but not necessarily contacted during the development of the plan. The coordinating organization should contact the identified partner organizations to see if they are capable of and interested in participation. This initial contact is also to gain a commitment of time and/or resources toward completion of the action items.

Internal partner organizations are departments within the City or other participating jurisdiction that may be able to assist in the implementation of action items by providing relevant resources to the coordinating organization.

External partner organizations can assist the coordinating organization in implementing the action items in various functions and may include local, regional, state, or federal agencies, as well as local and regional public and private sector organizations.

PLAN GOALS ADDRESSED:

The plan goals addressed by each action item are identified as a means for monitoring and evaluating how well the mitigation plan is achieving its goals, following implementation.

TIMELINE:

All broad scale action items have been determined to be ongoing, as opposed to short (0 to 2 years), medium (2-5 years), or long (6 or more years). This is because the action items are broad ideas, and although actions may be implemented to address the broad ideas, the efforts should be ongoing.

POTENTIAL FUNDING SOURCE

Where possible potential funding sources have been identified. Example funding sources may include: Federal Hazard Mitigation Assistance programs, state funding sources such as the Oregon Seismic Rehabilitation Grant Program, or local funding sources such as capital improvement or general funds. An action item may include several potential funding sources.

ESTIMATED COST

A rough estimate of the cost for implementing each action item is included. Costs are shown in general categories showing low, medium, or high cost. The estimated cost for each category is outlined below:

Low - Less than \$50,000

Medium - \$50,000 – \$100,000

High - More than \$100,000

Multi-Hazard #1

Proposed Action Item:		Alignment with Plan Goals:	
Develop, enhance, and implement public education and information materials concerning mitigation, preparedness and safety procedures for identified natural hazards.		Gopal 1, Goal 2, Goal 3, Goal 6, Goal 8	
Alignment with Existing Plans/Policies:			
Community Wildfire Protection Plan			
2020 Status/Rationale for Proposed Action Item:			
<p>The natural hazard sections of the City's addendum (Volume II) to the Yamhill Co. NHMP and Yamhill County's risk assessment (Volume I, Section 2 and Volume III, Appendix C) identify vulnerable populations and property within the various identified hazard areas. Increasing public outreach to educate residents about their risk to natural hazards affecting their community as well as what to do in the event of a natural hazard will help decrease their vulnerability to natural hazards.</p> <p>The Disaster Mitigation Act of 2000 requires communities to identify how the community will continue to involve the public in the plan maintenance process [201.6(c)(4)(iii)]. Educating landowners on how to mitigate the effects of natural hazards helps keep the public informed of what is being done with the plan, how the City is working to mitigate its risk to natural hazards, and allows for feedback and suggestions from the public for improving, updating, and maintaining the plan.</p>			
Ideas for Implementation:			
<p>Distribution of natural hazard information describing dangers and evacuation routes for visitors to the City and continued educational outreach for residents and business owners.</p> <p>Update brochures with new information provided as part of reports provided by DOGAMI, ODF, DLCD, and FEMA (among others).</p> <p>Identify and use existing mechanisms for public outreach (e.g., SWCD, NRCS, watershed councils, OSU Extension, etc.).</p>			
Coordinating Organization:		Administration, Fire District	
Internal Partners:		External Partners:	
City Council, School District		DOGAMI, DLCD, FEMA, ODF	
Potential Funding Sources:		Estimated cost:	Timeline:
General fund, grants		Low	<input type="checkbox"/> Short (0-2 years) <input type="checkbox"/> Medium (2-5 years) <input type="checkbox"/> Long (6+ years) <input checked="" type="checkbox"/> Ongoing
Form Submitted by:	2019-20 NHMP Steering Committee		
Priority:	High		

Multi-Hazard #4

Proposed Action Item:		Alignment with Plan Goals:	
Plan for solar + battery storage systems, which can serve as mini power-supply stations or provide residents the ability to shelter in place after any electricity supply-disrupting event, at varying scales (project, neighborhood and district) and locations (critical City facilities, low-income housing, community gathering spots).		Goal 1, Goal 3, Goal 4, Goal 6, Goal 8	
Alignment with Existing Plans/Policies:			
Comprehensive Plan, Development Code, Building Code			
2020 Status/Rationale for Proposed Action Item:			
<p>Power outages are possible during hazard events including wildfire, wind, and winter storms (snow/ice). If severe weather threatens a portion of the electric system, it may be necessary for PG&E to turn off electricity in the interest of public safety. No single factor drives a Public Safety Power Shutoff (PSPS), as each situation is unique. PG&E carefully reviews a combination of many criteria when determining if power should be turned off for safety. These factors generally include, but are not limited to:</p> <ul style="list-style-type: none"> • A Red Flag Warning declared by the National Weather Service • Low humidity levels, generally 20 percent and below • Forecasted sustained winds generally above 25 mph and wind gusts in excess of approximately 45 mph, depending on location and site-specific conditions such as temperature, terrain and local climate • Condition of dry material on the ground and live vegetation (moisture content) • On-the-ground, real-time observations from PG&E's Wildfire Safety Operations Center and field crews <p>PGE monitors and takes into consideration Red Flag Warnings issued from the National Weather Service, the issuance of a Red Flag Warning does not automatically trigger a PSPS if local conditions do not warrant activation.</p> <p>When you combine solar with battery storage you can power your home or business with solar and save any extra solar power in the battery to use later when you really need it.</p>			
Ideas for Implementation:			
Coordinate with utility provider (PG&E) and Energy Trust of Oregon and residents/business owners to develop and pilot solar + batter storage systems in private residences, businesses, and critical/essential facilities.			
Coordinating Organization:		Public Works	
Internal Partners:		External Partners:	
Administration, School District		Portland General Electric, Energy Trust of Oregon	
Potential Funding Sources:		Estimated cost:	Timeline:
General fund, grants, private investment		High	<input type="checkbox"/> Short (0-2 years) <input type="checkbox"/> Medium (2-5 years) <input checked="" type="checkbox"/> Long (6+ years) <input type="checkbox"/> Ongoing
Form Submitted by:	2019-20 NHMP Steering Committee		
Priority:	High		

Multi-Hazard #5

Proposed Action Item:		Alignment with Plan Goals:	
Replace Footbridge (utility bridge with pedestrian access) that carries water/sewer lines across the Yamhill River.		Goal 2, Goal 3, Goal 4, Goal 6, Goal 7, Goal 8	
Alignment with Existing Plans/Policies:			
Comprehensive Plan, Development Code, Building Code, Water System Master Plan, Wastewater System Facilities Plan			
2020 Status/Rationale for Proposed Action Item:			
The City has two (2) water transmission mains. One 8-inch diameter main is suspended from the city owned decommissioned Ferry St footbridge over the Yamhill River to the east of the city. The city's sewer main is also located under the Ferry St footbridge. These mains are vulnerable to seismic activity that could cause them to crack or impact the pedestrian footbridge over the Yamhill River.			
Ideas for Implementation:			
Retrofit or replace the Ferry Street footbridge to provide greater resilience to seismic activity.			
Coordinating Organization:		Community Development	
Internal Partners:		External Partners:	
Public Works		DLCD, DSL	
Potential Funding Sources:		Estimated cost:	Timeline:
General fund, HMA, utility rates		High	<input type="checkbox"/> Short (0-2 years) <input type="checkbox"/> Medium (2-5 years) <input checked="" type="checkbox"/> Long (6+ years) <input type="checkbox"/> Ongoing
Form Submitted by:	2019-20 NHMP Steering Committee		
Priority:	High		

Earthquake #1

Proposed Action Item:		Alignment with Plan Goals:	
Conduct seismic strength evaluations of critical facilities and infrastructure to identify vulnerabilities and seismically retrofit (structural and nonstructural) identified critical facilities and infrastructure to meet life safety standards in order to continue operations post-earthquake.		Goal 2, Goal 3, Goal 4, Goal 6, Goal 7, Goal 8	
Alignment with Existing Plans/Policies:			
2020 Status/Rationale for Proposed Action Item:			
<p>Currently, all new facilities must comply with and meet seismic standards. If someone moves into an old building, they must upgrade to current standards.</p> <p>DOGAMI did a windshield survey of schools, fire stations, police, and city halls (2007 RVS). The focus was on action of existing buildings and information was shared with participants.</p>			
Ideas for Implementation:			
<p>Provide information to government building and school facility managers and teachers on nonstructural mitigation techniques including: securing bookcases, filing cabinets, light fixtures, and other objects that can cause injuries and block exits;</p> <p>Encourage facility managers, business owners, and teachers to refer to FEMA's practical guidebook: Reducing the Risks of Nonstructural Earthquake Damage;</p> <p>Encourage homeowners and renters to use Is Your Home Protected from Earthquake Disaster? A Homeowner's Guide to Earthquake Retrofit (IBHS) for economic and efficient mitigation techniques;</p> <p>Use the FEMA 154 seismic evaluations generated by DOGAMI to prioritize critical and essential buildings for upgrades;</p> <p>Explore partnerships to provide retrofitting classes for homeowners, renters, building professionals, and contractors; and</p> <p>Target development located in potential fault zones or in unstable soils for intensive education and retrofitting resources.</p>			
Coordinating Organization:		Administration	
Internal Partners:		External Partners:	
Public Works, Planning		DOGAMI, School District, Fire District	
Potential Funding Sources:		Estimated cost:	Timeline:
General funds, utility fees, grants (SRGP, HMA)		High	<input type="checkbox"/> Short (0-2 years) <input type="checkbox"/> Medium (2-5 years) <input checked="" type="checkbox"/> Long (6+ years) <input type="checkbox"/> Ongoing
Form Submitted by:	2019-20 NHMP Steering Committee		
Priority:	High		

Wildfire #1

Proposed Action Item:		Alignment with Plan Goals:	
Coordinate wildfire mitigation action items through the Yamhill County Community Wildfire Protection Plan.		Goal 1, Goal 2, Goal 3, Goal 4, Goal 5, Goal 6, Goal 7, Goal 8	
Alignment with Existing Plans/Policies:			
Yamhill County Community Wildfire Protection Plan			
2020 Status/Rationale for Proposed Action Item:			
The wildfire mitigation action items provide direction on specific activities that organizations and residents in Dayton can take to reduce wildfire hazards.			
Ideas for Implementation:			
Implement high and medium priority projects including defensible space and fuels reduction projects identified in the CWPP.			
Coordinating Organization:		Dayton Fire District	
Internal Partners:		External Partners:	
Community Development		ODF	
Potential Funding Sources:		Estimated cost:	Timeline:
General fund, ODF grants		Medium	<input type="checkbox"/> Short (0-2 years) <input type="checkbox"/> Medium (2-5 years) <input type="checkbox"/> Long (6+ years) <input checked="" type="checkbox"/> Ongoing
Form Submitted by:	2019-20 NHMP Steering Committee		
Priority:	High		

ATTACHMENT B: PUBLIC INVOLVEMENT SUMMARY

Members of the steering committee provided edits and updates to the NHMP prior to the public review period as reflected in the final document.

To provide the public information regarding the draft NHMP addendum, and provide an opportunity for comment, an announcement (see text below) was announced on the city's website and an email contact was provided for public comment.

During the public review period there were no comments provided.

City of Dayton Public Comment


Dayton seeks additional public input on update to Natural Hazard Mitigation Plan

(Dayton, OR) – Dayton is in the process of updating their existing Natural Hazard Mitigation Plan (NHMP). This work is being performed in cooperation with the University of Oregon's Institute for Policy Research and Engagement - Oregon Partnership for Disaster Resilience and the Oregon Military Department's Office of Emergency Management utilizing funds obtained from the Federal Emergency Management Agency's (FEMA) Pre-Disaster Mitigation Grant Program. With re-adoption of the plan, Dayton will regain its eligibility to apply for federal funding towards natural hazard mitigation projects. This local planning process includes a wide range of representatives from city and county government, emergency management personnel, and outreach to members of the public in the form of an electronic survey.

A natural hazard mitigation plan provides communities with a set of goals, action items, and resources designed to reduce risk from future natural disaster events. Engaging in mitigation activities provides jurisdictions with a number of benefits, including reduced loss of life, property, essential services, critical facilities, and economic hardship; reduced short-term and long-term recovery and reconstruction costs; increased cooperation and communication within the community through the planning process; and increased potential for state and federal funding for recovery and reconstruction projects.

An electronic version of the updated draft Dayton NHMP addendum will be available for formal public comment beginning **August 14, 2020**. To view the draft please visit: www.ci.dayton.or.us/admin_comments.

If you have any questions regarding the Dayton NHMP addendum or the update process in general, please contact: Rochelle Roaden, City Manager, at (503) 864-2221 or roaden@ci.dayton.or.us; or Michael Howard, Assistant Program Director for the Oregon Partnership for Disaster Resilience at mrhoward@uoregon.edu.

 Dayton_Addendum_REVIEW DRAFT.pdf

The City invites your comments on this plan below:

Name

Physical Address

Mailing Address
If different than your physical address

Email:

What would you like us to know about the Dayton Addendum to the Yamhill County Multi-Jurisdictional Hazard Mitigation Plan?

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City of McMinnville Addendum to the Yamhill County Multi-Jurisdictional Hazard Mitigation Plan



Photo Credits: Gary Halvorson, Oregon State Archives

Effective: December 22, 2020 through December 21, 2025



Prepared for:
City of McMinnville

Prepared by:
University of Oregon
Institute for Policy Research and Engagement
Oregon Partnership for Disaster Resilience

Planning grant funding provided by:



FEMA

Federal Emergency Management Agency (FEMA)
Pre-Disaster Mitigation Program
Grant: HMGP-DR4328-5-P-OR
Disaster Award Number: 97.039

and

Additional Support Provided by:



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FEMA

January 20, 2021

The Honorable Casey Kulla
Chair Kulla, Yamhill County Board of Commissioners
535 NE 5th St.
McMinnville, Oregon 97128

Dear Chair Kulla:

On December 22, 2020, the U.S. Department of Homeland Security's Federal Emergency Management Agency (FEMA) Region 10, approved the Yamhill County Hazard Mitigation Plan as a multi-jurisdictional local plan as outlined in Code of Federal Regulations Title 44 Part 201. This approval provides the below jurisdictions eligibility to apply for the Robert T. Stafford Disaster Relief and Emergency Assistance Act's, Hazard Mitigation Assistance grants projects through December 21, 2025, through your state:

Yamhill County	City of Amity	City of Carlton	City of Dayton
City of McMinnville	City of Newberg	City of Sheridan	City of Yamhill

FEMA individually evaluates all application requests for funding according to the specific eligibility requirements of the applicable program. Though a specific mitigation activity or project identified in the plan may meet the eligibility requirements, it may not automatically receive approval for FEMA funding under any of the aforementioned programs.

Approved mitigation plans may be eligible for points under the National Flood Insurance Program's Community Rating System (CRS). For additional information regarding the CRS, please visit: www.fema.gov/national-flood-insurance-program-community-rating-system or contact your local floodplain manager. Over the next five years, we encourage your communities to follow the plan's schedule for monitoring and updating, and to develop further mitigation actions. To continue eligibility, jurisdictions must review, revise as appropriate, and resubmit the plan within five years of the original approval date.

If you have questions regarding your plan's approval or FEMA's mitigation grant programs, please contact Joseph Murray, Planner with Oregon Office of Emergency Management, at (503) 378-2911, who locally coordinates and administers these efforts.

Sincerely,

Kristen Meyers, Director
Mitigation Division

Enclosure

cc: Amie Bashant, Oregon Office of Emergency Management

EG:vl

RESOLUTION NO. 2020 – 67

A Resolution Adopting the City of McMinnville Representation in the Updates to the Yamhill County Multi-Jurisdictional Natural Hazards Mitigation Plan

RECITALS:

Whereas, the City of McMinnville recognizes the threat that natural hazards pose to people, property and infrastructure within our community; and

Whereas, undertaking hazard mitigation actions will reduce the potential for harm to people, property and infrastructure from future hazard occurrences; and

Whereas, an adopted Natural Hazards Mitigation Plan is required as a condition of future funding for mitigation projects under multiple FEMA pre- and post-disaster mitigation grant programs; and

Whereas, the City of McMinnville has fully participated in the FEMA prescribed mitigation planning process to prepare the *Yamhill County, Multi-Jurisdictional Natural Hazard Mitigation Plan*, which has established a comprehensive, coordinated planning process to eliminate or minimize these vulnerabilities; and

Whereas, the City of McMinnville has identified natural hazard risks and prioritized a number of proposed actions and programs needed to mitigate the vulnerabilities of the City of McMinnville to the impacts of future disasters within the *Yamhill County, Multi-Jurisdictional Natural Hazard Mitigation Plan*; and

Whereas, these proposed projects and programs have been incorporated into the *Yamhill County, Multi-Jurisdictional Natural Hazard Mitigation Plan* that has been prepared and promulgated for consideration and implementation by the cities of Yamhill County; and

Whereas, the Oregon Office of Emergency Management and Federal Emergency Management Agency, Region X officials have reviewed the *City of McMinnville addendum* to the *Yamhill County Multi-Jurisdictional Natural Hazard Mitigation Plan* and pre-approved it (dated, September 10, 2020) contingent upon this official adoption of the participating governments and entities; and

Whereas, the NHMP is comprised of comprised of three volumes: Volume I: Basic Plan, Volume II: Jurisdictional Addenda, and Volume III: Appendices, collectively referred to herein as the NHMP; and

Whereas, the NHMP is in an on-going cycle of development and revision to improve its effectiveness; and

Whereas, City of McMinnville adopts the NHMP and directs the staff to develop, approve, and implement the mitigation strategies and any administrative changes to the NHMP.

NOW, THEREFORE, BE IT RESOLVED BY THE COMMON COUNCIL OF THE CITY OF McMinnville, OREGON, as follows:

1. That the City of McMinnville adopts *the Yamhill County Multi-Jurisdictional Natural Hazards Mitigation Plan* as an official plan; and
2. That the City of McMinnville will submit this Adoption Resolution to the Oregon Office of Emergency Management and Federal Emergency Management Agency, Region X officials to enable final approval of the *Yamhill County Multi-Jurisdictional Natural Hazards Mitigation Plan*.
3. That this resolution shall take effect immediately upon passage and shall continue in full force and effect until revoked or replaced

Adopted by the Common Council of the City of McMinnville at a regular meeting held the 8th day of December 2020 by the following votes:

Ayes: Drabkin, Garvin, Geary, Menke, Peralta, Stassens

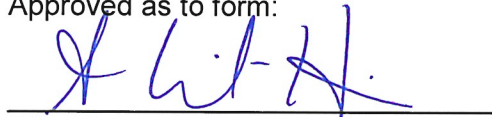
Nays: _____

Approved this 8th day of December 2020.



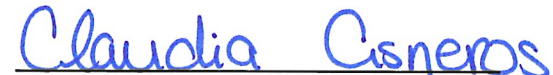
MAYOR

Approved as to form:



City Attorney

Attest:



City Recorder

**A RESOLUTION BY THE MCMINNVILLE WATER AND LIGHT COMMISSION
ADOPTING THE CITY OF MCMINNVILLE REPRESENTATION IN THE
UPDATES TO THE YAMHILL COUNTY MULTI-JURISDICTIONAL NATURAL
HAZARD MITIGATION PLAN**

WHEREAS, the City of McMinnville, a municipal corporation of the State of Oregon, acting by and through its Water and Light Commission (“McMinnville Water and Light Commission”) is responsible for the management of the water, electric, and fiber-optic systems of McMinnville; and

WHEREAS, the McMinnville Water and Light Commission recognizes the threat that natural hazards pose to people, property and infrastructure within our community; and

WHEREAS, undertaking hazard mitigation actions will reduce the potential for harm to people, property and infrastructure from future hazard occurrences; and

WHEREAS, an adopted Natural Hazard Mitigation Plan (NHMP) is required as a condition of future funding for mitigation projects under multiple FEMA pre- and post-disaster mitigation grant programs; and

WHEREAS, by participation of its professional management staff on the McMinnville NHMP Steering Committee, and review of the addendum in the commission meeting record of November 17, 2020, the McMinnville Water and Light Commission has fully participated in the FEMA prescribed mitigation planning process to prepare the *City-of-McMinnville addendum to the Yamhill County, Multi-Jurisdictional Natural Hazard Mitigation Plan*, which has established a comprehensive, coordinated planning process to eliminate or minimize these vulnerabilities; and

WHEREAS, in the addendum the McMinnville Water and Light Commission and the McMinnville City Council have identified natural hazard risks and prioritized a number of proposed actions and programs needed to mitigate the vulnerabilities of the City of McMinnville to the impacts of future disasters within the *Yamhill County, Multi-Jurisdictional Natural Hazard Mitigation Plan*; and

WHEREAS, these proposed projects and programs have been incorporated into the *Yamhill County, Multi-Jurisdictional Natural Hazard Mitigation Plan* that has been prepared and promulgated for consideration and implementation by the cities of Yamhill County; and

WHEREAS, the Oregon Office of Emergency Management and Federal Emergency Management Agency, Region X officials have reviewed the *City-of-McMinnville addendum* to the *Yamhill County Multi-Jurisdictional Natural Hazard Mitigation Plan* and pre-approved it (dated, September 10, 2020) contingent upon this official adoption of the participating governments and entities;

WHEREAS, the NHMP is comprised of three volumes: Volume I: Basic Plan, Volume II: Jurisdictional Addenda, and Volume III: Appendices, collectively referred to herein as the NHMP; and

WHEREAS, the NHMP is in an on-going cycle of development and revision to improve its effectiveness; and

WHEREAS, the McMinnville Water and Light Commission adopts the NHMP and directs its general manager to develop, approve, and implement the mitigation strategies and any administrative changes to the NHMP.

NOW, THEREFORE, BE IT RESOLVED, that the McMinnville Water and Light Commission adopts *the City-of-McMinnville addendum to the Yamhill County Multi-Jurisdictional Natural Hazard Mitigation Plan, as set forth in the commission meeting record of November 17, 2020*, as an official plan; and

BE IT FURTHER RESOLVED, that the McMinnville Water and Light Commission will submit this Adoption Resolution to the Oregon Office of Emergency Management and Federal Emergency Management Agency, Region X officials to enable final approval of the *Yamhill County Multi-Jurisdictional Natural Hazard Mitigation Plan*.

Adopted this 17 day of November, 2020



Mayor and ex-officio member of the Water and Light Commission

ATTEST:


Clerk of the Commission

Date: 11/30/20

Purpose

This is an update of the McMinnville addendum to the Yamhill County Multi-Jurisdictional Natural Hazard Mitigation Plan (NHMP). This addendum supplements information contained in Volume I (Basic Plan) which serves as the NHMP foundation, and Volume III (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 McMinnville's addendum are further discussed throughout the NHMP, and within Volume III, Appendix B, which provides an overview of alterations to the document that took place during the update process.

The City of McMinnville and the McMinnville Water and Light Commission (collectively "the City" or "McMinnville") adopted their addendum to the Yamhill County Multi-jurisdictional NHMP on **December 8 and November 17, 2020** respectively. FEMA Region X approved the Yamhill County NHMP and the City's addendum on **December 22, 2020**. With approval of this NHMP the City is now eligible to apply for the Robert T. Stafford Disaster Relief and Emergency Assistance Act's hazard mitigation project grants through **December 21, 2025**.

Mitigation Plan Mission

The NHMP mission states the purpose and defines the primary functions of the 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 City concurs with the mission statement developed during the Yamhill County planning process (Volume I, Section 3):

To promote public policy and mitigation activities which will enhance the safety to life and property from natural hazards.

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

Mitigation Plan Goals

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

The City concurs with the goals developed during the Yamhill County planning process (Volume I, Section 3). All NHMP goals are important and are listed below in no 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.

Below is a list of the NHMP goals:

GOAL 1: EMERGENCY OPERATIONS

- Coordinate natural hazard mitigation activities, where appropriate, with emergency operations plans and procedures and with other agencies.

GOAL 2: EDUCATION AND OUTREACH

- Develop and implement education and outreach programs to increase public awareness of the risks associated with natural hazards.

GOAL 3: PARTNERSHIPS

- Develop effective partnerships with public and private sector organizations and significant agencies and businesses for future natural hazard mitigation efforts.
- Coordinate natural hazard mitigation actions between the County and local jurisdictions to create more cohesive and effective hazard mitigation efforts.

GOAL 4: PREVENTIVE

- Develop and implement activities to protect human life, commerce, and property from natural hazards.
- Reduce losses and repetitive damage for chronic hazard events while promoting insurance coverage for catastrophic hazards.

GOAL 5: NATURAL RESOURCES UTILIZATION

- Link natural resources management, land use planning, and watershed planning with natural hazard mitigation activities to protect natural systems and allow them to serve natural hazard mitigation functions.

GOAL 6: IMPLEMENTATION

- Implement strategies to mitigate the effects of natural hazards and increase the quality of life and resilience of economies in Yamhill County.

GOAL 7: DEVELOPMENT

- Communities appropriately apply development standards that consider the potential impacts of natural hazards.

GOAL 8: DOCUMENTATION

- Document and evaluate progress in achieving hazard mitigation strategies and action items.

Process and Participation

This section of the NHMP addendum addresses 44 CFR 201.6(a)(3), *Participation*.

In addition to establishing a comprehensive community-level mitigation strategy, the Disaster Mitigation Act of 2000 (DMA2K), and the regulations contained in 44 CFR 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 pre-, and post-disaster mitigation project grants.

The Oregon Partnership for Disaster Resilience (OPDR) at the University of Oregon's Institute for Policy Research and Engagement (IPRE) collaborated with the Oregon Office of Emergency Management (OEM), Yamhill County, and McMinnville to update their NHMP. This project is funded through the Federal Emergency Management Agency's (FEMA) Hazard Mitigation Grant Program for DR-4328 (HMGP-DR-4328-OR-5-P). Members of the McMinnville NHMP Steering committee also participated in the County NHMP update process (Volume III, Appendix B).

The Yamhill County NHMP, and McMinnville addendum, are the result of a collaborative effort between citizens, public agencies, non-profit organizations, the private sector, and regional organizations. The McMinnville NHMP Steering Committee guided the process of developing the NHMP.

Convener and Committee

The McMinnville Community Development Director serves as the NHMP addendum convener. The convener of the NHMP will take the lead in implementing, maintaining, and updating the addendum to the Yamhill County NHMP in collaboration with the designated convener of the Yamhill County NHMP (Yamhill County Emergency Manager).

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

This addendum reflects decisions made at the designated meetings, and during subsequent work, and communication with Yamhill County Emergency Manager, and 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, action items, and community profile.

The McMinnville steering committee was comprised of the following representatives:

- Convener, Mike Bisset, Community Development Director
- Jenny Berg, Library Director
- James Burke, McMinnville Water & Light, Water Division Director
- Scott Burke, Information Technology Director
- John Dietz, McMinnville Water & Light, General Manager
- David Koch, City Attorney
- Leland Koester, Wastewater Services Manager
- Rich Leipfert, Fire Chief
- David Renshaw, Superintendent

- Heather Richards, Planning Director
- Scott Rosenbalm, McMinnville Water & Light, Electric Division Director
- Matt Scales, Chief of Police
- Larry Sherwood, Engineering Technician and Inspector
- Jeff Towery, City Manager

Public Participation

Public participation was achieved by posting the NHMP publicly and providing community members the opportunity to make comments and suggestions during the review process. Community members were also provided an opportunity for comment via a survey administered by IPRE (Volume III, Appendix F). During the City public review period (Attachment B) there were no comments provided.

Implementation and Maintenance

The City Council and the Water and Light Commission will be responsible for adopting the McMinnville addendum to the Yamhill County NHMP. This addendum designates the 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 McMinnville 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 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; 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 City will utilize the same action item prioritization process as the County (Volume I, Section 4).

Implementation through Existing Programs

This NHMP is strategic and non-regulatory in nature, meaning that it does not necessarily set forth any new policy. It does, however, provide: (1) a foundation for coordination and collaboration among agencies and the public in the city; (2) identification and prioritization of future mitigation activities; and (3) aid in meeting federal planning requirements and qualifying for assistance programs. The mitigation plan works in conjunction with other city plans and programs including the Comprehensive Land Use Plan, Capital Improvements Plan, and Building Codes, as well as the [Yamhill County NHMP](#), and the [State of Oregon NHMP](#).

The mitigation actions described herein (and priority actions in Attachment A) 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, McMinnville 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. Implementation opportunities are further defined in action items when applicable.

Future development without proper planning may result in worsening problems associated with natural hazards. McMinnville's acknowledged comprehensive plan is the City of McMinnville Comprehensive Plan. The City implements the plan through the Community Development Code.

McMinnville currently has the following plans that relate to natural hazard mitigation. For a complete list visit the City's [website](#):

- Comprehensive Plan (Volume 1, [Volume 2](#), Volume 3)
- [McMinnville Municipal Code](#)
 - Title 13 Public Utilities
 - Title 15 Building and Construction
 - Title 17 Zoning ([17.48 – Flood Area Zone](#), [17.53 Land Division Standards](#))
- Building Code, [2017 Oregon State Building Code](#) based on 2015 International Residential Code (IRC), and 2012 International Building Code (*to be updated to the 2020 Oregon State Building Code, anticipated October 2020*)
- [Emergency Operations Plan](#) (2010)
- [Public Facility Plan](#) (1995)
- [Transportation System Plan](#) (2010)
- [Conveyance System Master Plan](#) (2008)
- Water Master Plan (2010)
- [Storm Drainage Master Plan](#) (2009)
- Electric System Planning Study (2015)
- [Water Reclamation Facilities Plan](#) (2009)
- McGuire Emergency Action Plan (2018)
- Fire District Seismic Assessment (2018)
- Facilities Assessment (2018)
- [Highway 18/99w South Interchange Access Management Plan](#) (2002)
- [McMinnville Westside Bicycle and Pedestrian Plan](#) (1995)
- [Downtown Improvement Plan](#) (2000)
- [Northeast Gateway Plan](#) (2012)
- [Urban Renewal Plan](#) (2013)
- [Economic Development Strategic Plan](#) (2019)
- McMinnville Water & Light COOP (2018)

Other plans:

- [Yamhill County Community Wildfire Protection Plan](#) (2009, revised Nov. 2015)

Government Structure

The McMinnville City Charter establishes a Mayor-Council form of government, which vests policy authority in a volunteer City Council, and administrative authority for day-to-day operations in an appointed, professional City Manager. The McMinnville City Council consists of a Mayor and six Councilors (two from each ward) who serve four-year terms. The Council meets at least once per month at City Hall. The agenda of each meeting includes time for citizen comment. The city charter vest authority over the water and electric systems of the city in the Water and Light Commission (MW&L). The Commission consists of the mayor and four commissioners whom are appointed to four-year terms by the mayor and approved by the city council. The commission meets at least once per month.

The City of McMinnville currently has the following departments which have a role in natural hazard mitigation:

City Manager office provides strategic planning, budget and finance, and development of public policy recommendations to the City Council.

Community Development is composed of the airport, public works, engineering, and wastewater treatment facilities. Together the departments are responsible for maintaining and operating many of the basic urban services including the City's buildings and fleet (equipment), parks, streets, stormwater system, and wastewater system. The Public Works Department is responsible for the city's [Snow & Ice Response Plan](#).

Planning services include all long range and current planning for new development, as well as the City's flood plain management zone. Planning is also responsible for implementation of the Comprehensive Plan. The planning department also includes the building division which reviews and inspects commercial, industrial, and residential developments.

Police services include law enforcement activities and emergency management (emergency preparedness, mitigation, response and recovery efforts for McMinnville during emergencies, disasters, or disruptions).

Fire provides emergency services including fire suppression, emergency medical response, hospital ambulance transportation, water and dive rescue operations, hazardous materials incidents, and disaster response. Non-emergency services include fire prevention and inspection services, code enforcement, public safety education services/CPR training, fire extinguisher use, residential safety surveys, home fire escape planning, emergency and disaster preparedness planning and training for citizens (CERT), and fire and life safety education in McMinnville schools.

McMinnville Water & Light (MW&L) provides water, power, and fiber to the greater McMinnville area. A general manager oversees daily operations, budgets, finances, and advises the commission on strategic planning. MW&L serves approximately 17,000 electrical customers, 12,000 water customers, and fiber to the City of McMinnville and McMinnville School District facilities. MW&L's electric utility encompasses approximately 75 square miles, has 7 electric sub-stations (11 power transformers), 332 miles of primary distribution lines (55% overhead, 45% underground), and a 115 KV transmission line (5.6 miles). The water utility owns 6350 acres of watershed in the Coast Mountain Range where McGuire and Haskins Reservoirs are located (3.5 billion gallons capacity). Water from McGuire and Haskins Reservoirs is treated at the Norman Scott Water Treatment Plant, which operates

24 hours a day/365 days per year and has the capacity to treat up to 22 million gallons of water per day. After treatment, water is stored in four water reservoirs with storage capacity of 22.7 million gallons.

Continued Public Participation

An open public involvement process is essential to the development of an effective NHMP. To develop a comprehensive approach to reducing the effects of natural disasters, the planning process shall include opportunities for the public, neighboring communities, local, and regional agencies, as well as, private, and non-profit entities to comment on the NHMP during review.¹ Keeping the public informed of efforts to reduce its risk to future natural hazard events is important for successful NHMP implementation, and maintenance. As such, the City is committed to involving the public in the NHMP review and update process (Volume I, Section 4). The City posted the plan update for public comment before FEMA approval, and after approval will maintain the plan on the City's website:

<https://www.mcminnvilleoregon.gov/>.

NHMP Maintenance

The Yamhill County NHMP, and City addendum will be updated every five years in accordance with the update schedule outlined in the Disaster Mitigation Act of 2000. During the County NHMP update process, the City will also review, and update its addendum (Volume I, Section 4). The convener will be responsible for convening the steering committee to address the questions outlined below.

- Are there new partners that should be brought to the table?
- Are there new local, regional, state or federal policies influencing natural hazards that should be addressed?
- Has the community successfully implemented any mitigation activities since the NHMP was last updated?
- Have new issues or problems related to hazards been identified in the community?
- Are the actions still appropriate given current resources?
- Have there been any changes in development patterns that could influence the effects of hazards?
- Have there been any significant changes in the community's demographics that could influence the effects of hazards?
- Are there new studies or data available that would enhance the risk assessment?
- Has the community been affected by any disasters? Did the NHMP accurately address the impacts of this event?

These questions will help the steering committee determine what components of the mitigation plan need updating. The steering committee will be responsible for updating any deficiencies found in the NHMP.

¹ Code of Federal Regulations, Chapter 44. Section 201.6, subsection (b). 2015

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) were first developed during the 2019-2020 NHMP planning process and will be revised during subsequent NHMP updates. During these processes, the steering committee assessed the City's risk, identified potential issues, and developed a mitigation strategy (action items).

Priority Action Items

Table MA-1 presents a list of mitigation actions. The steering committee 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 in **bold** text with grey 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 steering committee in terms of implementation, the steering committee 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 detailed information for each high priority action. Full text of the plan goals referenced in Table MA-1 is located on page MA-2.

Table MA-I McMinnville Action Items

Natural Hazard Action ID	Action Item	Coordinating Organization (Lead)	Partners	Potential Funding	Cost	Timing	Plan Goals Addressed							
							Goal 1	Goal 2	Goal 3	Goal 4	Goal 5	Goal 6	Goal 7	Goal 8
Multi-Hazard Actions														
Multi-Hazard #1	Develop, enhance, and implement public education and information materials concerning mitigation, preparedness and safety procedures for identified natural hazards.	Emergency Management, MW&L	Planning, Public Works, Fire, Police	General fund, grants	L	Ongoing	✓	✓	✓			✓	✓	
Multi-Hazard #2	Incorporate mitigation planning provisions into community planning processes such as comprehensive, capital improvement, land use, transportation plans, zoning ordinances, community development practices, etc.	Planning	Engineering, MW&L	General fund, utility rates	L	Short	✓			✓	✓	✓	✓	
Multi-Hazard #3	Identify critical facilities without emergency power and encourage these facilities to secure emergency power to mitigate power outage events due to natural hazard events. Consider outreach to private property owners.	MW&L	Fire, Police, Public Works, School District	General fund, utility rates	H	Medium	✓		✓		✓	✓	✓	
Multi-Hazard #4	Construct resilient above ground and underground power grid to reduce power line failure during severe wind or winter ice storm events.	MW&L	Public Works, Planning, Developers	Utility rates, private investment	H	Medium	✓		✓	✓	✓		✓	

Natural Hazard Action ID	Action Item	Coordinating Organization (Lead)	Partners	Potential Funding	Cost	Timing	Plan Goals Addressed							
							Goal 1	Goal 2	Goal 3	Goal 4	Goal 5	Goal 6	Goal 7	Goal 8
Multi-Hazard #5	Retrofit critical structures to protect them from seismic, floods, high winds, earthquakes, or other natural hazards.	MW&L	Public Works, Fire, Police, School District	General fund, utility rates, grants	H	Long			✓	✓		✓	✓	✓
Multi-Hazard #6	Develop and maintain GIS mapped critical facility inventory	Engineering, MW&L	Planning, Fire, Police	General fund, grants	L	Short	✓	✓	✓	✓		✓		✓
Multi-Hazard #7	Develop and maintain GIS mapped hazard areas within the UGB.	Engineering, MW&L	Planning, Fire, Police	General fund, grants	L	Short	✓	✓	✓	✓		✓		✓
Multi-Hazard #8	Develop & construct multi-jurisdictional fuel station and mobile fuel capabilities	Engineering, MW&L	Planning, Fire, Police	MW&L, general fund	H	Short	✓	✓	✓	✓		✓		✓
Multi-Hazard #9	Develop & construct redundant community water source and supply	MW&L	Engineering, other cities, Yamhill Co.	Utility rates	H	Long	✓	✓	✓	✓		✓		✓
Multi-Hazard #10	Establish a process to coordinate with state and Federal agencies to maintain up-to-date hazard data, maps and assessments.	Planning	MW&L, Fire, Police, Public Works	General funds, grants	L	Short	✓	✓	✓	✓		✓		✓
Multi-Hazard #11	Limit (e.g. reduced density, etc.) or prohibit development in high hazard areas.	Planning	Engineering	General funds	L	Ongoing		✓	✓	✓		✓	✓	✓
Multi-Hazard #12	Encourage mitigation practices in developments at risk to natural hazards.	Planning	Engineering	General funds	L	Ongoing	✓	✓	✓	✓		✓		✓

Natural Hazard Action ID	Action Item	Coordinating Organization (Lead)	Partners	Potential Funding	Cost	Timing	Plan Goals Addressed							
							Goal 1	Goal 2	Goal 3	Goal 4	Goal 5	Goal 6	Goal 7	Goal 8
Multi-Hazard #13	Promote resilience, response, mitigation, and recovery planning for local businesses to continue operating after a disaster.	Administration	Planning, Public Works, Police, Fire, MW&L, Chamber, MDA, MEDP	General funds, grants, private investment	L	Ongoing	✓	✓	✓	✓		✓	✓	✓

Drought Actions

No actions Identified at this time

Earthquake Actions

Earthquake #1	Complete inventory and seismic assessment of critical facilities.	Engineering, MW&L	School District, Fire District, Planning	General funds, utility fees, grants	H	Short	✓	✓	✓		✓	✓	✓
Earthquake #2	Seismically retrofit (structural and nonstructural) identified high risk critical facilities and infrastructure to meet life safety standards in order to continue operations post-earthquake.	Engineering, MW&L	School District, Fire District, Planning	General fund, utility fees, grants	H	Long	✓	✓	✓		✓	✓	✓
Earthquake #3	Complete inventory & seismic assessment of public and commercial buildings that may be particularly vulnerable to earthquake damage.	Engineering, MW&L	Chamber, property owners	General fund, utility fees, grants	H	Short	✓	✓	✓		✓	✓	✓
Earthquake #4	Conduct outreach & training of local builders, architects, engineers and inspectors to develop post-earthquake building evaluation resources	Planning	Professional organization, contractors	General fund, permit fees	L	Ongoing	✓	✓	✓		✓	✓	✓

Natural Hazard Action ID	Action Item	Coordinating Organization (Lead)	Partners	Potential Funding	Cost	Timing	Plan Goals Addressed							
							Goal 1	Goal 2	Goal 3	Goal 4	Goal 5	Goal 6	Goal 7	Goal 8
Earthquake #5	Educate property owners about structural and non-structural retrofitting of vulnerable buildings and encourage retrofit.	Planning	FEMA, DLCD, OEM	General fund, permit fees	L	Ongoing		✓	✓	✓				
Earthquake #6	Develop an outreach program to educate and encourage homeowners and tenants to secure furnishings, storage cabinets, and utilities to prevent injuries and damage.	Planning	FEMA, DLCD, OEM	General fund, permit fees	L	Ongoing		✓	✓	✓				
Flood Actions														
Flood #1	Ensure continued compliance in the National Flood Insurance Program (NFIP) through enforcement of local floodplain management ordinances.	Planning	Administration, Engineering	General fund	L	Ongoing	✓	✓	✓	✓	✓	✓	✓	✓
Flood #2	Work with FEMA to update FIRMs. Request DOGAMI debris flow and lidar data be included in FIRM updates. Use the updated FIRMS for land use and mitigation planning.	Planning	Public Works, FEMA, DOGAMI, DLCD	General fund, HMA	M	Mid-Term	✓		✓	✓		✓		✓
Flood #3	Inventory and improve drainage (e.g., culverts) to increase drainage capacity and efficiency.	Engineering	Planning, private developers	Stormwater utility fees, private investment	H	Long	✓		✓	✓		✓		✓
Flood #4	Develop and maintain GIS mapped critical facility inventory for all structures and residential and commercial buildings located within 100-year and 500-year floodplains.	Planning	Public Works, Engineering	Stormwater utility fees	L	Short Term	✓		✓	✓		✓		✓

Natural Hazard Action ID	Action Item	Coordinating Organization (Lead)	Partners	Potential Funding	Cost	Timing	Plan Goals Addressed							
							Goal 1	Goal 2	Goal 3	Goal 4	Goal 5	Goal 6	Goal 7	Goal 8
Flood #5	Establish flood mitigation priorities for critical facilities and residential and commercial buildings located within the 100- year floodplain using survey elevation data.	Engineering	Planning, Administration	General fund, HMA	H	Long Term			✓	✓		✓		✓
Landslide Actions														
Landslide #1	Utilize technology, geologic resources and other available data (such as DOGAMI LIDAR data) to identify and map potential areas for landslides - high, moderate and low.	Planning	DOGAMI, Engineering, MW&L	General fund, utility fees, grants	M	Short	✓	✓	✓			✓		✓
Landslide #2	Develop a process to limit future development in high landslide potential areas - permitting, geotechnical review, soil stabilization techniques, etc.	Planning	Engineering, MW&L	General fund, utility fees, grants	M	Short		✓		✓	✓	✓	✓	✓
Landslide #3	Development in steeply-sloped areas (greater than 15%) should be subject to specific development requirements to control erosion.	Planning	Engineering, MW&L	General fund, utility fees, grants	L	Short		✓	✓	✓		✓		✓
Landslide #4	Complete an inventory of locations where critical facilities, other buildings and infrastructure may be subject to landslides.	Planning	Engineering, MW&L	General fund, utility fees, grants	M	Short			✓	✓	✓	✓		✓
Severe Weather Actions (Windstorm and Winter Storms – Snow/Ice)														
Severe Weather #1	Develop and implement programs to coordinate maintenance and mitigation activities to reduce risk to public infrastructure from severe winter storms.	Public Works	Engineering, MW&L	Utility fees	M	Ongoing		✓	✓	✓		✓		✓

Natural Hazard Action ID	Action Item	Coordinating Organization (Lead)	Partners	Potential Funding	Cost	Timing	Plan Goals Addressed							
							Goal 1	Goal 2	Goal 3	Goal 4	Goal 5	Goal 6	Goal 7	Goal 8
Severe Weather #2	Review critical facilities and government building energy efficiency, winter readiness, and electrical protection capability. Identify, prioritize, and implement infrastructure upgrade or retrofit project prioritization and development.	Engineering, MW&L	Planning, Fire, Police, School District	General funds, utility fees, grants	H	Medium		✓		✓		✓		✓
Severe Weather #3	Develop, implement, and maintain jurisdictional debris management plans	Public Works	MW&L, Planning, County EM	General funds, utility fees, grants	M	Short		✓	✓	✓		✓		✓
Severe Weather #4	Implement tree clearing mitigation programs to keep trees from threatening lives, property, and public infrastructure from severe weather events.	Public Works, MW&L	Planning, property owners	General funds, utility fees, grants	M	Ongoing		✓	✓	✓	✓	✓		✓
Volcanic Event Actions														
Volcanic Event #1	Evaluate ash impact on utility infrastructure, transportation network, public facilities, including the airport, and develop mitigation actions.	Engineering	Public works, airport, MW&L, Police, Fire	General funds, utility fees, grants	M	Medium				✓	✓	✓		✓
Wildfire Actions														
Wildfire #1	Coordinate wildfire mitigation action items through the Yamhill County Community Wildfire Protection Plan.	Fire	Planning, Emergency Management	General fund, ODF, grants	M	Ongoing	✓	✓	✓	✓	✓	✓	✓	✓
Wildfire #2	Provide wildland fire information in an easily distributed format for all residents.	Fire	Planning, Emergency	General fund, utility fees	L	Ongoing	✓	✓	✓			✓		✓

Natural Hazard Action ID	Action Item	Coordinating Organization (Lead)	Partners	Potential Funding	Cost	Timing	Plan Goals Addressed							
							Goal 1	Goal 2	Goal 3	Goal 4	Goal 5	Goal 6	Goal 7	Goal 8
			Management, MW&L											
Wildfire #3	Develop, implement, and enforce vegetation management codes/plans to reduce wildfire risk.	Planning, Fire	Public Works, MW&L	General fund, grants	L	Short		✓	✓	✓	✓	✓	✓	✓
Wildfire #4	Conduct residential audits for wildland and building fire hazard identification then develop an outreach program to disseminate the findings.	Fire	Planning, Public Works, MW&L	General fund, grants	L	Short		✓	✓	✓	✓	✓	✓	✓

Source: City of McMinnville steering committee, 2020.

Note: Full text of the plan goals referenced in this table is located on page MA-2.

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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, Section 2, and Volume III, Appendix C. The risk assessment process is graphically depicted in Figure MA-1. Ultimately, the goal of hazard mitigation is to reduce the area of risk, where hazards overlap vulnerable systems.

Figure MA-1 Understanding Risk



Hazard Analysis

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

Table MA-2 shows the HVA matrix for McMinnville 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 sense of hazard priorities but does not predict the occurrence of a hazard.

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

Table MA-2 Hazard Analysis Matrix

Hazard	Maximum		Total Threat Score	Hazard Rank	Hazard Tiers		
	History	Vulnerability				Threat	Probability
Winter Storm	16	40	80	56	192	#1	Top Tier
Earthquake - Cascadia	6	45	100	35	186	#2	
Windstorm	16	25	70	56	167	#3	
Wildfire	6	20	80	35	141	#4	Middle Tier
Drought	8	15	50	56	129	#5	
Earthquake - Crustal	6	25	70	21	122	#6	
Flood	8	15	40	49	112	#7	Bottom Tier
Landslide	6	15	50	35	106	#8	
Volcanic Event	4	10	30	7	51	#9	

Source: McMinnville steering committee, 2019-2020.

Table MA-3 categorizes the probability, and vulnerability scores from the hazard analysis for the City and compares the results to the assessment completed by the Yamhill County steering committee. Variations between the City, and County are noted in **bold** text within the city ratings.

Table MA-3 Probability and Vulnerability Comparison

Hazard	McMinnville		Yamhill County	
	Probability	Vulnerability	Probability	Vulnerability
Drought	High	Low	High	Moderate
Earthquake - Cascadia	Moderate	High	Moderate	High
Earthquake - Crustal	Low	Moderate	Low	Moderate
Flood	Moderate	Low	High	High
Landslide	Moderate	Low	High	Low
Volcanic Event	Low	Low	Low	Low
Wildfire	Moderate	Moderate	Low	Low
Windstorm	High	Moderate	High	Moderate
Winter Storm	High	High	High	High

Source: McMinnville and Yamhill County steering committee, 2019-2020.

Community Characteristics

Table MA-4 and the following section provides information on City specific demographics, and assets. 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. Between 2012 and 2019 the City grew by 1,495 people (5%).² According to the State's official coordinated population forecast, between 2019 and 2040 the City's population is forecast to grow by 38% to 46,956.³ *Note: the State is currently updating the official forecast and the proposed 2040 population is 42,457 which represents a 25% increase from 2019 population.*⁴ Median household income increased by 12% between 2012 and 2017.⁵

New development has complied with the standards of the [Oregon Building Code](#), and the city's development code including their floodplain ordinance.

Economy

The City of McMinnville is in the south-central portion of Yamhill County. McMinnville's commercial areas developed along primary routes and residential development followed nearby (see Figure MA-2).

McMinnville is the largest incorporated community in Yamhill County. There is significant economic activity happening within the City, making it a desirable place to live, work, and visit. Most workers residing in the city (62%, 9,291 people) travel outside of the city for work primarily to the Portland metro area, Salem, and Newberg.⁶ A significant population of people travel to the city for work, (77% of the workforce, 6,613 people) primarily from Salem, Portland metro area, Newberg, Sheridan, Dayton, Lafayette, Dundee, and Amity.

McMinnville residents are employed in a variety of occupations including professional (18%), management, business, and financial operations (14%), production (12%), office and administrative support (11%), and transportation and material moving (9%) occupations.⁷

The largest employers in the city as of 2019 are [employer (# of employees)]: Willamette Valley Medical Center (473), Linfield College (413), Cascade Steel Rolling Mills Inc. (408), Meggitt Polymers & Composites (377), Betty Lou's, Inc. (243), Oregon Mutual Insurance Company (191), World Class Technology (152), Skyline Homes (125), Wal-mart Stores, Inc. (109), Freelin Wade (108), and Northwest Unmanned Aviation Vehicles (NWUAV; 108).

² Portland State University, Population Research Center, "Annual Population Estimates", 2019.

³ Portland State University, Population Research Center, "Oregon Population Forecast Program Cycle 1 (2014-2017)". 2017.

⁴ Portland State University, Population Research Center, "Oregon Population Forecast Program Cycle 2 (2018-2020)". 2020 (proposed).

⁵ Social Explorer, Table T57, U.S. Census Bureau, 2013-2017 and 2008-2012 American Community Survey Estimates.

⁶ U.S. Census Bureau. LEHD Origin-Destination Employment Statistics (2002-2017). Longitudinal-Employer Household Dynamics Program, accessed on April 25, 2020 at <https://onthemap.ces.census.gov>.

⁷ Social Explorer, Table A17008, U.S. Census Bureau, 2013-2017 American Community Survey Estimates.

Table MA-4 Community Characteristics

Population Characteristics		
2012 Population	32,435	
2019 Population	33,930	
2040 Forecasted Pop. [Proposed]*	46,956 [42,457]	
Race (non-hispanic) and Ethnicity (Hispanic)		
White		72%
Black/ African American		1%
American Indian and Alaska Native		< 1%
Asian		2%
Native Hawaiian and Other Pacific Islander		< 1%
Some Other Race		< 1%
Two or More Races		3%
Hispanic or Latino		22%
Limited or No English Spoken	2,803	9%
Vulnerable Age Groups		
Less than 15 Years	7,180	22%
65 Years and Over	5,608	17%
Disability Status		
Total Population	5,687	17%
Children	602	7%
Seniors	2,108	39%
Income Characteristics		
Households by Income Category		
Less than \$15,000	1,339	11%
\$15,000-\$29,999	2,059	17%
\$30,000-\$44,999	1,916	16%
\$45,000-\$59,999	1,905	15%
\$60,000-\$74,999	1,216	10%
\$75,000-\$99,999	1,646	13%
\$100,000-\$199,999	1,893	15%
\$200,000 or more	402	3%
Median Household Income	\$50,299	
Poverty Rates		
Total Population	5,173	16%
Children	1,731	22%
Seniors	249	5%
Housing Cost Burden		
Owners with Mortgage	1,201	16%
Renters	2,539	51%

Source: U.S. Census Bureau, 2013-2017 American Community Survey; Portland State University, Population Research Center, "Annual Population Estimates", 2019. Portland State University, Population Research Center, "Oregon Population Forecast Program Cycle 1 (2014-2017)". 2017. and "Oregon Population Forecast Program Cycle 2 (2018-2020)". 2020 (proposed).

Housing Characteristics		
Housing Units		
Single-Family	8,382	64%
Multi-Family	3,007	23%
Mobile Homes	1,700	13%
Year Structure Built		
Pre-1970	2,866	22%
1970-1989	4,075	31%
1990-2009	5,799	44%
2010 or later	349	3%
Housing Tenure and Vacancy		
Owner-occupied	7,362	56%
Renter-occupied	5,014	38%
Seasonal	77	1%
Vacant	636	5%

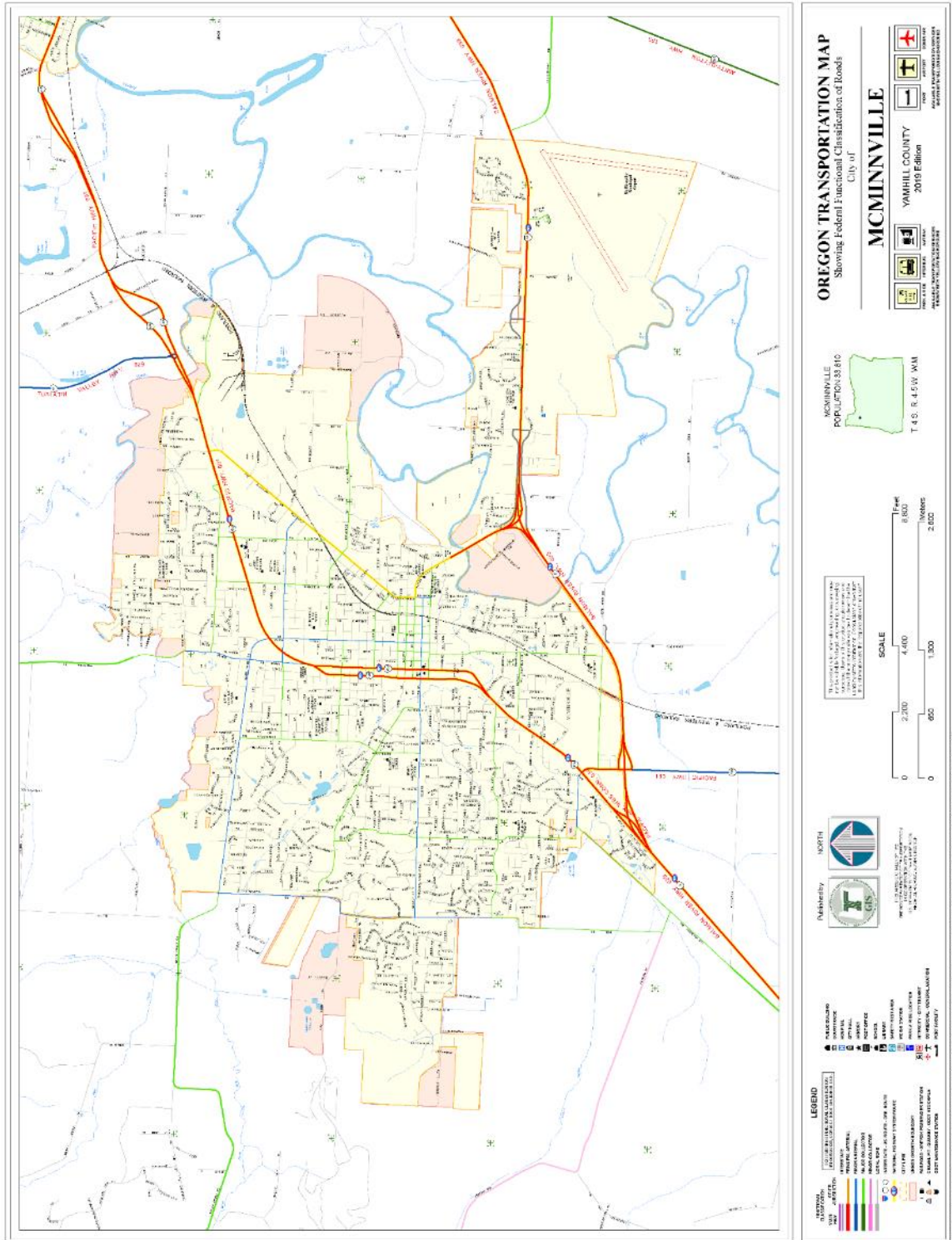
The Willamette River is approximately 6 miles east of the city and there are three drainage basins within the city: North Yamhill River, South Yamhill River, Baker Creek, North and West Cozine Creek.

McMinnville is generally flat with more hilly areas to the west. Its soils are moderately well-drained to well drained silt loams primarily of the Amity and Woodburn series. The area that is not urbanized is cultivated or comprised of small grains, grass, pasture plant, scattered Oak, and Douglas Fir.

McMinnville's temperatures range from a monthly average low of 34-38°F in the winter months to average highs of 75-83°F in the summer months. The coolest months are December-February and the warmest months are July and August. The average annual precipitation is about 42 inches and approximately 73% falls between November and March.

The City has an educated population with 86% of residents 25 years, and older holding a high school degree, 24% have a bachelor's degree or higher. The McMinnville School District has a 91% graduation rate as of 2019. McMinnville includes industrial and commercial development but is zoned primarily residential.

Figure MA-2 Oregon Transportation Map: City of McMinnville



Source: Oregon Department of Transportation

Community Assets

This section outlines the resources, facilities, and infrastructure that, if damaged, could significantly impact the public safety, economic conditions, and environmental integrity of McMinnville.

Critical facilities and infrastructure are those that support government and first responders' ability to act in an emergency. They are a top priority in any comprehensive hazard mitigation plan. These include locally designated shelters and other essential assets, such as fire stations, and water and wastewater treatment facilities (see Table MA-5). **Essential facilities and infrastructure** are those that support the continued delivery of key government services, and/or that may significantly impact the public's ability to recover from the emergency. These facilities may include: City buildings and other public facilities such as schools. MW&L infrastructure and facilities are shown on pages MA-26 to 27.

It is important to note that the facilities identified as "critical" and "essential" are characterized differently than the structural code that identifies buildings as "essential" and "non-essential." The structural code uses different language and criteria and therefore have completely different meanings than the buildings identified in this addendum.

Table MA-5 Critical and Essential Facilities

Facility Name	Address	
Government See Table MA-6 for information on seismic vulnerability.		
City Hall	230 NE 2nd St.	Critical
Community Development Center	231 NE 5th St.	Essential
Public Works	1900 NE Riverside Drive	Critical
Water Reclamation Facility (back up EOC)	3500 NE Clearwater Drive	Critical
Civic Hall	200 NE 2nd Street	Essential
Library	225 NW Adams	Essential
Community Center (Shelter)	600 NE Evans	Critical
McMinnville Senior Center (Shelter)	2250 NE McDaniel Lane	Critical
Collections Shop	3450 NE Clearwater Drive	Critical
See section below for information on Water and Wastewater Infrastructure		
Yamhill County Facilities		
Yamhill County Sheriff's Office / Jail	535 NE 5th St.	Critical
Yamhill County Emergency Management	414 NE Evans Street	Critical
Yamhill County Public Works	2060 NE Lafayette Ave	Critical
Yamhill County Fairgrounds (Shelter)	2070 NE Lafayette Ave	Critical
Riverbend Landfill / Waste Management (private)	13469 SE Hwy 18 (outside city)	Critical
Oregon State Facilities		
ODOT Maintenance Station	1502 Hwy 99W	Critical
Emergency Response		
McMinnville Police Department (EOC)	121 SW Adams St.	Critical

McMinnville Fire Department	175 SE 1st St.	Critical
Yamhill Communications Agency (YCOM)	121 SW Adams	Critical
Oregon State Facilities		
Oregon State Police/FAA	3975 NE Cirrus Ave	Critical
McMinnville Armory	333 Armory Way	Critical
Educational (Public)		
McMinnville SD 40 (Admin Office)	800 NE Lafayette Ave	Essential
Grandhaven Elementary School	3200 NE McDonald Ln.	Essential
Columbus Elementary School	1600 SW Fellows	Essential
Memorial Elementary School	501 W 14th St.	Essential
Newby Elementary School	1125 W 2nd St.	Essential
Sue Buel Elementary	1985 SE Davis	Essential
Duniway Middle School (Shelter)	575 NW Michelbook Ln.	Critical
Patton Middle School (Shelter)	1175 E 19th St.	Critical
McMinnville High School (Shelter)	615 E 15th St.	Critical
Educational (Private/Charter/Montessori, etc.)		
McMinnville Adventist Christian School	1349 NW Elm St.	Essential
St James Catholic School (Shelter)	206 NE Kirby St.	Critical
St John Lutheran School	2142 NE McDonald Ln.	Essential
Bethel Christian School	325 NW Baker Creek Rd.	Essential
International Community School	533 NW Adams St.	Essential
McMinnville Montessori School	1101 SE Brooks St.	Essential
Colleges/Universities		
Linfield College	900 SE Baker St.	
Chemeketa Community College	288 NE Norton	
Medical Care Facilities		
McMinnville Immediate Health Care	207 NE 19th St	Critical
Physicians Medical Center	2435 NE Cumulus Ave	Critical
Virginia Garcia Memorial Health Center	115 NE May Lane	Critical
West Hills Healthcare Clinic	2163 NW 2nd St	Critical
Willamette Valley Medical Center	2700 SE Stratus Avenue	Critical
Community Assets		
First Baptist Church (Shelter)	125 SE Cowls St	Critical
Hillside Retirement Community (Shelter)	900 NW Hill Road	Critical
Seventh Day Adventist Church (Shelter)	1500 Old Sheridan Road	Critical
True Vine Christian Fellowship (Shelter)	118 NE 4th St	Critical
Transportation		
First Student Inc. (school busses)	1936 NE Lafayette Ave	Critical
Yamhill County Transit Center	800 NE 2nd St	Critical

Transportation/Infrastructure

Mobility plays an important role in McMinnville, and the daily experience of its residents, and businesses. Motor vehicles represent the dominant mode of travel through, and within McMinnville. McMinnville is served by Yamhill County Transit among other transit providers.

Infrastructure that provides critical and essential services include:

Railroads

Railroads are major providers of regional and national cargo and trade flows. Railroads run through the Northern Willamette region provide vital transportation links from the Pacific to the rest of the country. The Portland & Western (PNWR) provides freight service to/from the city. There is no passenger rail service in the city.

Rails are sensitive to icing from the winter storms that can occur in the Northern Willamette region. For industries in the region that utilize rail transport, these disruptions in service can result in economic losses. The potential for rail accidents caused by natural hazards can also have serious implications for the local communities if hazardous materials are involved.

Airports

The city has no commercial service airports, however Portland International Airport (PDX), the largest and busiest airport in the state, is in nearby Multnomah County. There is one public airport: McMinnville Municipal Airport located in the southeast portion of the City along the Salmon River Hwy (OR 18)/SE McMinnville Bypass.

Roads/Seismic lifelines

Oregon Highway 99W is the major north-south transportation route, and Oregon Highway 18 (Salmon River Highway) is the major east-west transportation route, through the city. Oregon Highway 47, 2nd Street, Wallace Road, Hill Road, Baker Street, Fellows Street, and Lafayette Avenue are other major transit routes in the city (see Figure MA-2).

Seismic lifeline routes help maintain transportation facilities for public safety and resilience in the case of natural disasters. Following a major earthquake, it is important for response and recovery agencies to know which roadways are most prepared for a major seismic event. The Oregon Department of Transportation has identified lifeline routes to provide a secure lifeline network of streets, highways, and bridges to facilitate emergency services response after a disaster.⁸

System connectivity and key geographical features were used to identify a three-tiered seismic lifeline system. Routes identified as Tier 1 are considered the most significant and necessary to ensure a functioning statewide transportation network. The Tier 2 system provides additional connectivity to the Tier 1 system, it allows for direct access to more locations and increased traffic volume capacity. The Tier 3 lifeline routes provide additional connectivity to the systems provided by Tiers 1 and 2.

The Lifeline Routes in McMinnville:

⁸ Oregon Department of Transportation. Oregon Seismic Lifeline Evaluation, Vulnerability Synthesis, and Identification, *Oregon Seismic Lifeline Routes*, May 15 2012. Page 6-4 figure 6-1. Accessed September 12, 2019.

- Tier I: Hwy 18 southwest of McMinnville, Hwy 99W northeast of McMinnville.
- Tier II: Hwy 99W south of McMinnville
- Tier III: None

Bridges

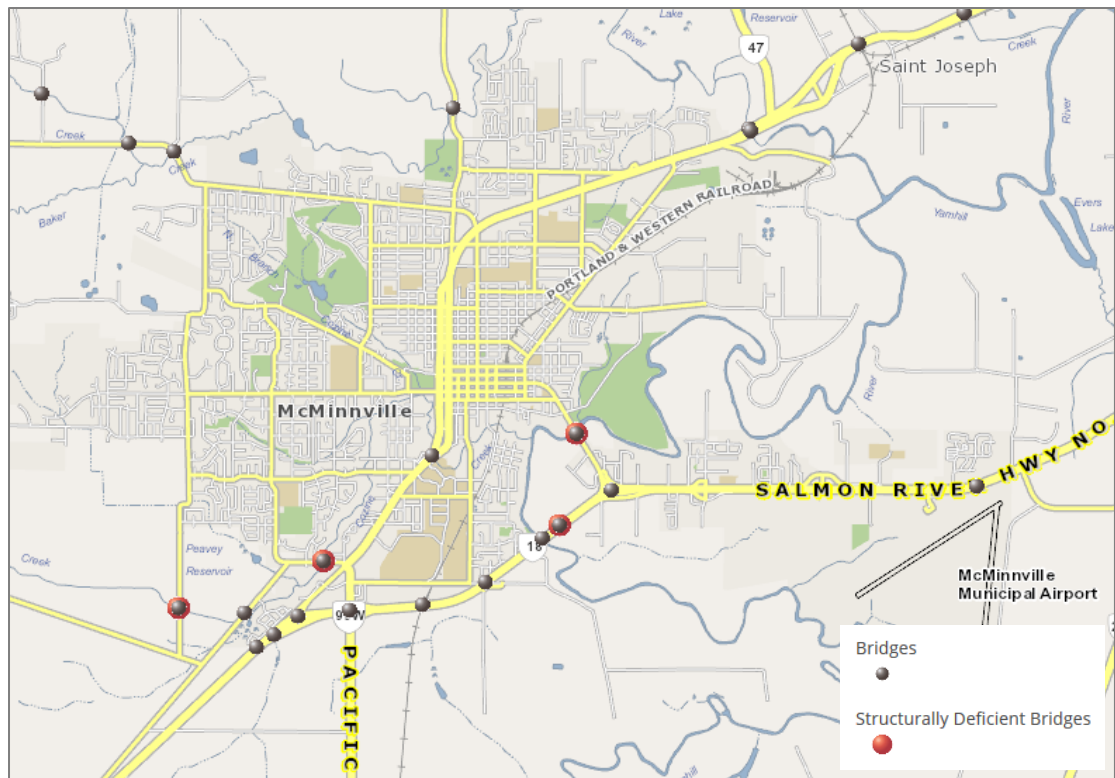
Because of earthquake risk, the seismic vulnerability of the city's bridges is an important issue. Non-functional bridges can disrupt emergency operations, sever lifelines, and disrupt local and freight traffic. These disruptions may exacerbate local economic losses if industries are unable to transport goods. Bridges within the city that are critical or essential include (see Figure MA-3):

- Old Sheridan Rd (City)
- Cozine Creek, Old Sheridan Rd (ODOT 00315F) – *structurally deficient*
- 3 Mile Lane Bridge (ODOT) – *structurally deficient*
- Hwy 99 north (ODOT)
- Hwy 99 south (ODOT)
- Hwy 18-S. Yamhill River (ODOT 08492) - *structurally deficient*
- Hwy 18-S. Yamhill floodplain (ODOT 06758) *structurally deficient*

Overpasses

- 3 Mile Lane over Hwy 18 (ODOT)
- Hwy 18 off ramp over Hwy 18 (ODOT)
- Hwy 18 over RR crossing (ODOT)
- Booth Bend Road over Hwy 18 (ODOT)
- Hwy 99 over Hwy 18 (ODOT)

Figure MA-3 Oregon Bridges and Structurally Deficient Bridges



Source: Oregon Department of Transportation, ODOT TransGIS, accessed April 27, 2020

Utility lifelines are the resources that the public relies on daily such as, electricity, fuel and communication lines. If these lines fail or are disrupted, the essential functions of the community can become severely impaired. Utility lifelines are closely related to physical infrastructures, like dams and power plants, as they transmit the power generated from these facilities.

Generally, the network of electricity transmission lines running throughout the city is operated by McMinnville Water & Light. The Williams Gas Pipeline provides natural gas that is delivered to customers in the city by Northwest Natural Gas. These lines may be vulnerable as infrequent natural hazards, like earthquakes, could disrupt service to natural gas consumers across the region.

The city water, wastewater, and stormwater (culvert) systems include the following:

McMinnville Water and Light Infrastructure

- McMinnville Water & Light, Office, 855 NE Marsh Ln, Essential
- McGuire Dam/Reservoir, 28656 NW Meadowlake Rd, Yamhill (outside City), Critical
- Haskins Dam, 23130 NW Haskins Cr Rd, Yamhill (outside City), Critical
- Fox Ridge Reservoirs, 12300 NW Fox Ridge Rd (outside City), Critical
- Water Treatment Plant, 23100 NW Haskins Cr Rd, Yamhill (outside City), Critical
- High Heaven Lookout, 6660 NW High Heaven Rd, Critical
- Baker Creek substation, 1901 NW Baker Creek Rd, Essential
- Booth Bend substation, 4591 SE Booth Bend Rd, Essential
- Cascade substation, 3250 NE Hwy 99W, Essential
- East McMinnville substation, 1880 NE Riverside Dr, Essential
- Gormley substation, 10120 Hwy 18, Essential
- Walnut City substation, 1945 NW 2nd St, Essential

Wastewater Infrastructure

- Wastewater Treatment Plant, 3500 NE Clearwater Drive, Critical
- Wastewater Diversion Structure, 1900 NE Riverside Drive, Critical
- Wastewater Lafayette Overflow 1220 NE Lafayette Ave, Critical
- Wastewater Outfall-Yamhill River 5115 NE Riverside Drive, Critical
- 3-Mile Lane #1 Pump Station (PS), 2005 NE Cumulus Way, Critical
- 3-Mile Lane #3 PS, 3305 NE 3-Mile Lane, Critical
- Autumn Ridge PS, 599 NE Summerfield Street, Critical
- Cozine PS, 325 SE Irvine, Critical
- Cozine Woods PS, 1355 SW Old Sheridan, Critical
- Crestbrook PS, 1045 NW Baker Crest Ct., Critical
- Kathleen Manor PS, 1835 SW Alexandria, Critical
- Morgan Lane PS, 1655 SE Morgan Lane, Critical
- Northeast PS, 3395 NE Daffodil Dr., Critical
- Oregon Street PS, 200 SE Oregon Street, Critical
- Raw Sewage PS & diversion structure, 1950 NE Riverside Drive, Critical
- Riverside Drive PS, 4015 NE Riverside Drive, Critical
- Westside PS, 2850 NE Baker Street, Critical

Culverts

- 2nd Street, Critical
- Elmwood, Critical
- Michelbook, Critical
- Davis Street, Critical
- Ford Street, Essential
- Fellows Street, Critical
- Fleishauer Lane, Essential
- Cypress Street, Essential

Environmental Assets/Parks:

Environmental assets are those parks, green spaces, wetlands, and rivers that provide an aesthetic, and functional ecosystem services for the community include:

Bend-O-River Mini-Park	Riverside Drive Dog Park
Chegwyn Farms Neighborhood Park	Rotary Nature Preserve at Tice Woods
City Park	Taylor Park
Discovery Meadows Community Park	Thompson Park
Galen McBee Airport Park	West Hills Neighborhood Park
Heather Hollow	West McMinnville Linear Park
Joe Dancer Park	Westside Bicycle/Pedestrian
Kingwood Mini-Park	Greenway
Kiwanis Park	Wortman Park
North Evans Mini-Park	Jay Pearson Park)

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:

Child Care Facilities

Bear Hugs Child Development Center	Madrona Childcare
Calico Cat Childcare	Nadines Childcare
Care for Kids	Noah's Ark Daycare
Carolyns Childcare	St James School Extended Care
Chysalis Children	Tender Loving Childcare
Grandma Chris Preschool and Daycare	Trinity Learning Center
Happy Face Daycare	Trinity Learning Daycare Center
Head Start of Yamhill Co McMinnville Ctr	Vickies Daycare
Helping Hands Daycare	West Hills Daycare
Little Friends of Hope Daycare	

Adult Care Facilities

Alterra Villas McMinnville	Brookdale Senior Living-Villa McMinnville
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Community Homecare Willamette Valley
Courtyard at Hillside Memory Care
Harmony Living
Life Care Center of McMinnville
Oakwood Home Services
Osprey Court Memory Care Community

Osprey Pointe Assisted Living Community
Parkland Village Assisted Living
Rock of Ages Mennonite Home
United Homecare Services
Virginia Garcia Memorial Health Center
Wynwood of McMinnville

Community, 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 McMinnville 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. The following community, cultural, and historic resources can be found in the City:

Downtown McMinnville National
Register Historic District
Evergreen Aviation Museum

Northwest Senior & Disability Services
YCAP
Yamhill County Gospel Mission

A complete list of historic resources is located on the City website: [Link](#)

Hazard Characteristics

Drought

The steering committee determined that the City's probability for drought is **high**, and that their vulnerability to drought is **low**.

Volume I, Section 2 describes the characteristics of drought hazards, history, as well as the location, extent, and probability of a potential event. The spring/summer of 2018 was particularly dry period for the City. Due to the climate of Yamhill County, past, and present weather conditions have shown an increasing potential for drought.

The City of McMinnville is provided water by McMinnville Water and Light (MW&L) which owns 6,350 acres of watershed in the Coast Mountain Range approximately 9 miles northwest of the City. Water from the McGuire and Haskins Reservoirs (combined 3.5 billion gallons capacity) is treated at the water treatment facility that can treat up to 22 million gallons per day (mgd). Following treatment water flows via two 24-inch and 16-inch water transmission mains to four (4) water storage reservoirs (22.7 million gallons capacity) at Fox Ridge west of the city. MW&L has approximately 21 miles of transmission pipeline ranging from 16-inch to 48-inch and about 157 miles of distribution pipeline ranging in size from 2-inch to 36-inch.

MW&L has enough capacity to meet current and anticipated future demand.

For more information on McMinnville’s water supply visit their website: <https://www.mc-power.com/>

Vulnerability Assessment

Due to insufficient data and resources, McMinnville is currently unable to perform a quantitative risk assessment, or exposure analysis, for this hazard. State-wide 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 apply to humans and resources. Industries important to the City of McMinnville’s local economy such as agriculture, fishing, and timber have historically been affected, and any future droughts would have tangible economic and potentially human impacts.

The city’s existing water supply is most vulnerable to wildfire which may impact the MW&L watershed and is increased during periods of drought. The MW&L water transmission and distribution lines are vulnerable to seismic activity that could cause them to fail. There is a low chance that dams at McGuire and Haskins Reservoirs could be impacted by seismic activity.

Mitigation Activities

The City provides information on water conservation to McMinnville water customers. The City engages in other water conservation measures including water line leak detection and repair, replacement of deteriorating pipe, and replacement/repair of older and under-registering water meters and reducing dead end lines in order to increase water circulation throughout the system.

McMinnville Codes Pertaining to Droughts

The following McMinnville codes, plans, and policies pertain to droughts:

1. McMinnville Comprehensive Plan.
2. McMinnville Municipal Code
3. MW&L provides information on water conservation to residential customers ([link](#)).

Please review Volume I, Section 2 for additional information on this hazard.

Earthquake (Cascadia Subduction Zone)

The steering committee determined that the City’s probability for a Cascadia Subduction Zone (CSZ) earthquake is **moderate** and that their vulnerability to a CSZ earthquake is **high**.

Volume I, Section 2 describes the characteristics of earthquake hazards, history, as well as the location, extent, and probability of a potential event. Generally, an event that affects the County is likely to affect McMinnville as well. The causes, and characteristics of an earthquake event are appropriately described within the 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 McMinnville as well.

Within the Northern Willamette Valley are that includes Yamhill County, two potential faults and/or zones can generate high-magnitude earthquakes. These include the Cascadia

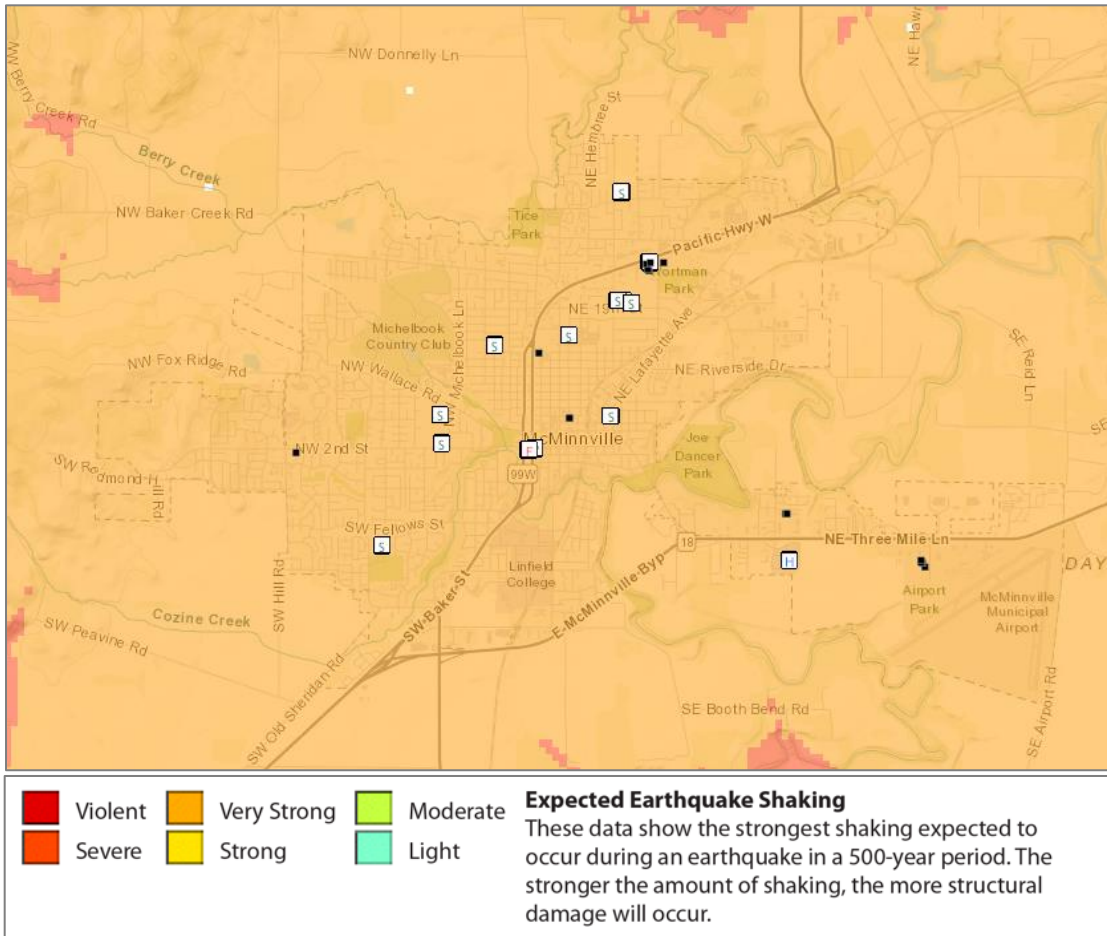
Subduction Zone and the Gales Creek-Newberg-Mt. Angel Structural Zone (including the Newberg Fault).

Cascadia Subduction Zone

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 approximately 1700 A.D.⁹

Figure MA-4 displays relative shaking hazards from a Cascadia Subduction Zone earthquake event. As shown in the figure, most of the City is expected to experience very strong (orange) shaking in a CSZ event.

Figure MA-4 Cascadia Subduction Zone Expected Shaking



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

⁹ The Cascadia Region Earthquake Workgroup, 2005. Cascadia Subduction Zone Earthquakes: A magnitude 9.0 earthquake scenario. <http://www.crew.org/PDFs/CREWSubductionZoneSmall.pdf>

The city'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 City 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 McMinnville within the "Valley Zone" (Valley Zone, from the summit of the Coast Range to the summit of the Cascades). Within the Northwest Oregon region, 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.

Earthquake (Crustal)

The steering committee determined that the City's probability for a crustal earthquake is **low** and that their vulnerability to crustal earthquake is **moderate**.

Volume I, Section 2 describes the characteristics of earthquake hazards, history (see below), as well as the location, extent, and probability of a potential event. Generally, an event that affects the County is likely to affect McMinnville 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 McMinnville as well.

The 1993 Scotts Mill earthquake impacted McMinnville including damaging beyond repair the former building located where Columbus Elementary is now (constructed in 1995).

Figure MA-5 shows a generalized geologic map of the McMinnville area that includes the areas for potential regional active faults, earthquake history (1971-2008), and soft soils (liquefaction) hazard. The figure shows the areas of greatest concern within the City limits as red and orange. Except for portions of the west hills all the city is within the moderate earthquake liquefaction hazard zone. Areas just outside the UGB to the north and south are within the high earthquake liquefaction hazard zone. These areas are also in moderate and high landslide hazard zones and may be prone to earthquake induced landslides (see Figure MA-7).

Vulnerability Assessment (subduction zone and crustal)

Due to insufficient data and resources, McMinnville is currently unable to perform a quantitative risk assessment for this hazard.

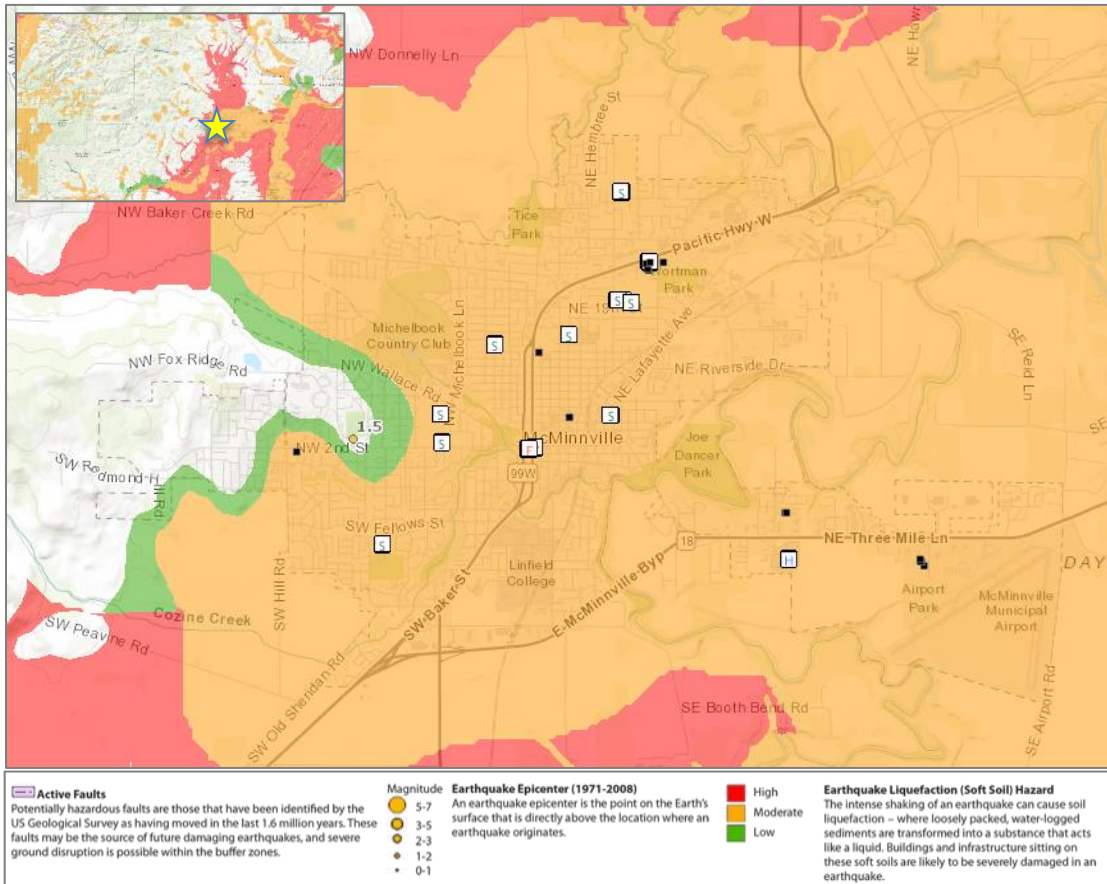
The western portion of Yamhill County is likely to experience higher levels of shaking than the eastern portion, as a result of its proximity to the Cascadia Subduction Zone.

The City of McMinnville is in the south-central portion of Yamhill County, in a region likely to experience strong shaking should a subduction zone or significant crustal earthquake occur. This rating represents the peak acceleration of the ground caused by the earthquake, and for a strong designation corresponds to 9-20 percent of the acceleration of gravity.

Ground movement in both areas, however, is likely to cause damage to weak, unreinforced masonry buildings, and to induce small landslides along unstable slopes. As well as landslide, earthquakes can trigger other hazards such as dam failure and disruption of transportation and utility systems.

Utility systems will be significantly damaged, including damaged buildings, and damage to utility infrastructure, including water 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. 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.

Figure MA-5 Active Crustal Faults, Epicenters (1971-2008), and Soft Soils



Source: [Oregon HazVu: Statewide Geohazards Viewer \(DOGAMI\)](#)

Note: To view detail click the link above to access Oregon HazVu.

Building codes were implemented in Oregon in the 1970s, however, stricter standards did not take effect until 1991 and early 2000s. As noted in the community characteristics section (Table MA-4), approximately 53% of residential buildings were built prior to 1990, which increases the City's vulnerability to the earthquake hazard. Information on specific public buildings' (schools and public safety) estimated seismic resistance, determined by DOGAMI in 2007, is shown in Table MA-6; each "X" represents one building within that ranking category. Of the facilities evaluated by DOGAMI, that have not been retrofitted, using their Rapid Visual Survey (RVS), one building has very high (100% chance) collapse potential and two (2) school buildings have a high (greater than 10% chance) collapse potential.

Table MA-6 Rapid Visual Survey Scores

Facility	Site ID*	Level of Collapse Potential			
		Low (<1%)	Moderate (>1%)	High (>10%)	Very High (100%)
Schools					
District Offices (Cook Elem.) (800 NE Lafayette Ave)	Yamh_sch10	Seismic retrofit per local bond			
Columbus Elementary (1600 SW Fellows)	Yamh_sch26	X			
Grandhaven Elementary (3200 NE McDonald Ln)	Yamh_sch23	X			
Memorial Elementary (501 W 14 th St)	Yamh_sch11		SRGP 2015-17 Phase II: \$692,688		
Newby Elementary (1125 W 2 nd St)	Yamh_sch12		SRGP 2015-17 Phase II: \$420,187		
Duniway Middle (575 Michelbook Ln)	Yamh_sch02	X			
Patton Middle (1175 E 19 th St)	Yamh_sch14		X	X,X	
McMinnville High (615 E 15 th St)	Yamh_sch15				X
Public Safety					
Fire Department (175 E 1 st St)	Yamh_fir06		X		
Oregon State Police (EOC) (130 NE Baker St)	Yamh_pol08		X		
Yamhill Co. Sheriff's Office (535 NE 5 th St)	Yamh_pol02			X	
ODOT Maintenance Station (1502 N Hwy 99W)	Yamh_pol06		X		
Hospital					
Willamette Valley Medical Center (2700 SE Stratus Ave)	Yamh_hos01	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 Yamhill County Map](#)

Note: The McMinnville Police Department was not assessed. The ODOT Maintenance Station was previously the Newberg-Dundee Police and 911 Call Center. Sue Buell Elementary was built in 2006 and not assessed. The District offices were previously Cook Elementary.

Mitigation Activities

Earthquake mitigation activities listed here include current mitigation programs and activities that are being implemented by McMinnville agencies or organizations.

A primary mitigation objective is to construct or upgrade critical and essential facilities and infrastructure to withstand future earthquake events. Seismic retrofit grant awards per the

[Seismic Rehabilitation Grant Program](#)¹⁰ have been funded to retrofit Adams School, McMinnville School District (2015-17, Phase II, grant award, \$1,500,000), Memorial Elementary, McMinnville School District (2015-17, Phase II, grant award, \$692,688), and Newby Elementary, McMinnville School District (2015-17, Phase II, grant award, \$420,187). Cook Elementary/School District Offices were retrofitted per a local bond in 2017. The McMinnville Fire Department has undergone a Level II seismic analysis in preparation for future seismic retrofit work.

The City of McMinnville fire department [website refers to](#) the Yamhill County [Community Emergency Response Team](#) (CERT) program that trains members in mitigation as well as preparedness and response. The City's Emergency Management Program works with community groups, businesses, residential facilities, and public and private schools in promoting earthquake preparedness and mitigation.

McMinnville Codes Pertaining to Earthquakes

The following McMinnville codes, plans, and policies pertain to earthquakes:

1. McMinnville Comprehensive Plan (*under contract to update in 2020*). The updated plan includes a Natural Hazards Inventory and Management Program Recommendations including information on earthquake and other geologic hazards impacting the city.
2. The City of McMinnville enforces the [Oregon Building Code](#) which includes provisions for earthquakes.

Please review Volume I, Section 2 for additional information on this hazard.

Flood

The steering committee determined that the City's probability for flood is **moderate** and that their vulnerability to flood is **low**.

Volume I, Section 2 describes the characteristics of flood hazards, history, as well as the location, extent, and probability of a potential event. Portions of McMinnville have areas of floodplains (special flood hazard areas, SFHA). These include areas include along the Yamhill River (South and North) and the West and North Forks of Cozine Creek, and Baker Creek (Figure MA-6).

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 McMinnville 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.

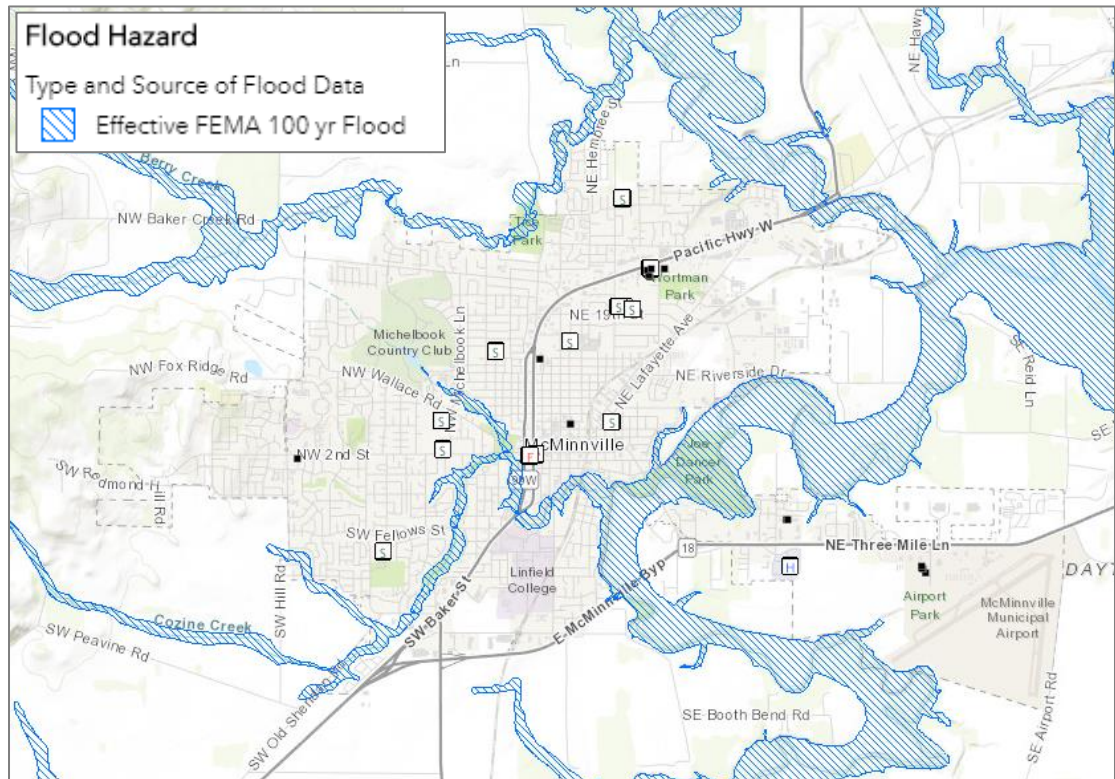
Floods can have a devastating impact on almost every aspect of the community, including private property damage, public infrastructure damage, and economic loss from business interruption. It is important for the City to be aware of flooding impacts and assess its level

¹⁰ 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.

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. Business owners, and their employees are significantly impacted by flood events. Direct damages from flooding are the most common impacts, but indirect damages, such as diminished clientele, can be just as debilitating to a business.

Figure MA-6 Special Flood Hazard Area- update



Source: [Oregon HazVu: Statewide Geohazards Viewer \(DOGAMI\)](#)

Note: To view detail click the link above to access Oregon HazVu.

Vulnerability Assessment

Due to insufficient data and resources, McMinnville is currently unable to perform a quantitative risk assessment for this hazard. FEMA FIRMs were used to outline the 100-year and 500-year floodplains for the City of McMinnville. The 100-year floodplain delineates an area of high risk, while the 500-year floodplain delineates an area of moderate risk. There is no residential development within the floodplain. Commercial and industrial development is largely on higher ground outside of the special flood hazard area (SFHS). Localized flooding can occur due to various factors including blocked stream channels or storm drains.

National Flood Insurance Program (NFIP)

FEMA's Flood Insurance Study (FIS), and Flood Insurance Rate Maps (FIRMs) are effective as of March 2, 2010. Table MA-7 shows that as of August 2019, McMinnville has 29 National Flood Insurance Program (NFIP) policies in force. Of those, four (4) are for properties that were constructed before the initial FIRMs. McMinnville's last Community Assistance Visit (CAV) was November 13, 1997. The City does not participate in the Community Rating

System (CRS). The table shows that most flood insurance policies are for residential structures, single-family homes, and there is one non-residential property insured. There has been one (1) paid flood insurance claims for \$223. The City complies with the NFIP through enforcement of their flood damage prevention ordinance and their floodplain management program.

Table MA-7 Flood Insurance Detail

	Yamhill County	McMinnville
Effective FIRM and FIS	3/2/2010	3/2/2010
Initial FIRM Date	-	12/1/1982
Total Policies	446	29
Pre-FIRM Policies	153	4
Policies by Building Type		
Single Family	401	28
2 to 4 Family	14	0
Other Residential	10	0
Non-Residential	21	1
Minus Rated A Zone	72	0
Insurance in Force	\$100,617,300	\$8,452,700
Total Paid Claims	81	1
Pre-FIRM Claims Paid	68	1
Substantial Damage Claims	3	0
Total Paid Amount	\$1,166,076	\$223
Repetitive Loss Structures	4	0
Severe Repetitive Loss Properties	1	0
CRS Class Rating	-	NP
Last Community Assistance Visit	-	11/13/1997

Source: Department of Land Conservation and Development, August 2019. Repetitive Flood Loss information provided by FEMA correspondence on September 10, 2020. NP = Not Participating

The Community Repetitive Loss record for McMinnville identifies no Repetitive Loss Properties¹¹ or Severe Repetitive Loss Properties¹².

Mitigation Activities

Flood mitigation activities listed here include current mitigation programs and activities that are being implemented by McMinnville agencies or organizations.

¹¹ 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.

¹² 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.

McMinnville Codes Pertaining to Flooding

The following McMinnville codes, plans, and policies pertain to flooding:

1. McMinnville Comprehensive Plan (*under contract to update in 2020*). The updated plan includes a Natural Hazards Inventory and Management Program Recommendations including information on flood hazards impacting the city.
2. McMinnville Municipal Code [17.48 – Flood Area Zone](#). This portion of the Community Development Code implements the Goal 7 policies of the Comprehensive Plan and regulates development within the floodplain.

Please review Volume I, Section 2 for additional information on this hazard.

Landslide

The steering committee determined that the City's probability for landslide is **moderate** and that their vulnerability to landslide is **low** for the city as a whole, but that there were sections of the West Hills within the city limits that have high probability of landslides and the vulnerability to people and property in this section of the city is high.

Volume I, Section 2 describes the characteristics of landslide hazards, history, as well as the location, extent, and probability of a potential event within the region.

Landslide susceptibility exposure for McMinnville is shown in Figure MA-7. Approximately 8% of McMinnville has very high or high, and approximately 12% moderate, landslide susceptibility exposure.¹³ In general, the areas of greater risk are located adjacent to rivers and creeks (including the South Yamhill River and Cozine Creek). The area of the city that has the highest landslide susceptibility is in the west hills that has high and moderate landslide susceptibility (extending beyond the UGB and to the north and south along NW Fox Ridge Road in the north and SW Redmond Hill Road in the south). This area is sparsely developed currently which reduces the city's vulnerability, however, there is land within the city's UGB in this region. Development in these areas should consider strategies to reduce landslide hazard risk, including the prohibition of development in the highest risk areas. Please see the DLCD and DOGAMI publication [Preparing for Landslide Hazards, A Land Use Guide for Oregon Communities](#) (October 2019).

Potential landslide-related impacts are adequately described within Volume I, Section 2, and include infrastructure 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 occur during any winter, and thoroughfares beyond City limits are susceptible to obstruction as well. There are two mapped historic landslides in the city adjacent to the Cozine Creek: (1) south end of SE Evans St, damages included a broken 21-inch sanitary sewer trunk line that was replaced, and (2) northeast of Oak Grove Way east of SE Baker St, damages included a 1,000 gallon gasoline tank that was relocated.

The most common type of landslides are slides caused by erosion. Slides move in contact with the underlying surface, are generally slow moving, and can be deep. Rainfall-initiated

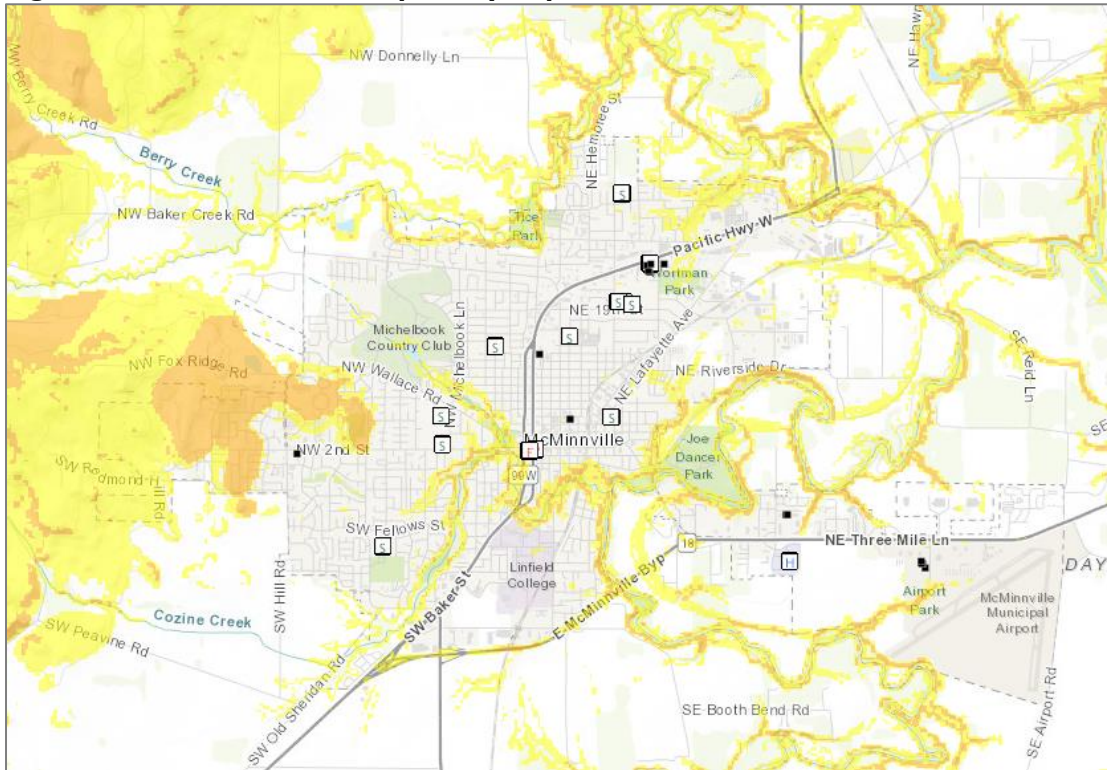
¹³ DOGAMI. [Open-File Report, O-16-02](#), *Landslide Susceptibility Overview Map of Oregon* (2016)

landslides tend to be smaller; while earthquake induced landslides may be quite large. All soil types can be affected by natural landslide triggering conditions.

Vulnerability Assessment

Due to insufficient data and resources, McMinnville is currently unable to perform a quantitative risk assessment for this hazard. DOGAMI completed a statewide landslide susceptibility assessment in 2016 ([O-16-02](#)), general findings from that report are provided above and within Figure MA-7.

Figure MA-7 Landslide Susceptibility Exposure



Low	Landsliding unlikely. Areas classified as Landslide Density = Low (less than 7%) and areas classified as Slopes Prone to Landsliding = Low.
Moderate	Landsliding possible. Areas classified as Landslide Density = Low to Moderate (less than 17%) and areas classified as Slopes Prone to Landsliding = Moderate OR areas classified as Landslide Density = Moderate (7%-17%) and areas classified as Slopes Prone to Landsliding = Low.
High	Landsliding likely. Areas classified as Landslide Density = High (greater than 17%) and areas classified as Slopes Prone to Landsliding = Low and Moderate OR areas classified as Landslide Density = Low and Moderate (less than 17%) and areas classified as Slopes Prone to Landsliding = High.
Very High	Existing landslides Landslide Density and Slopes Prone to Landsliding data were not considered in this category. Note: the quality of landslide inventory (existing landslides) mapping varies across the state.

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

Response and recovery efforts will likely vary from minor cleanup to more extensive utility system rebuilding. Utility disruptions are usually local and terrain dependent. Damages may require reestablishing electrical, communication, and gas pipeline connections occurring from specific breakage points. Initial debris clearing from emergency routes and

high traffic areas may be required. Water and wastewater utilities may need treatment to quickly improve water quality by reducing excessive water turbidity and reestablishing waste disposal capability.

Mitigation Activities

Landslide mitigation activities listed here include current mitigation programs and activities that are being implemented by the City of McMinnville agencies or organizations.

City of McMinnville Codes Pertaining to Landslides

The following McMinnville codes, plans, and policies pertain to landslides:

1. McMinnville Comprehensive Plan (*under contract to update in 2020*). The updated plan includes a Natural Hazards Inventory and Management Program Recommendations including information on landslide and other geologic hazards impacting the city.
2. The City of McMinnville enforces the [Oregon Building Code](#) which includes provisions that address the potential for geologic hazards including landslides.

Please review Volume I, Section 2 for additional information on this hazard.

Severe Weather

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

Windstorm

The steering committee determined that the City's probability for windstorm is **high** and that their vulnerability to windstorm is **moderate**.

Volume I, Section 2 describes the characteristics of windstorm hazards, history, 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 flooding and winter storms (ice, freezing rain, and very rarely, snow). Other severe weather events that may accompany windstorms, including thunderstorms, hail, lightning strikes, and tornadoes are generally negligible for McMinnville.

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.

Damage from high winds generally has resulted in downed utility lines, and trees usually limited to several localized areas. 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 may cause localized urban flooding.

Please review Volume I, Section 2 for additional information on this hazard.

Winter Storm (Snow/Ice)

The steering committee determined that the City's probability for winter storm is **high** and that their vulnerability to winter storm is **high**.

Volume I, Section 2 describes the characteristics of winter storm hazards, history, 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.

Vulnerability Assessment

Due to insufficient data and resources, McMinnville is currently unable to perform a quantitative risk assessment, or exposure analysis, for the windstorm and winter storm hazards. All areas within the City of McMinnville are equally at risk of a windstorm or winter storm event.

Mitigation Activities

The City works to mitigate problems regarding windstorm and winter storm issues when they arise. Mitigation activities listed here include current mitigation programs and activities that are being implemented by McMinnville agencies or organizations.

- ODOT is responsible for plowing, sanding, and de-icing state managed roads including: OR 99W within city limits.
- The City is responsible for plowing, sanding and de-icing designated roadways as per the City's [Snow and Ice Response Plan](#).
- The City requires that all new utility lines, cables or wires, on new development be placed underground.
- The City provides education on winter weather preparedness
- The City encourages property owners to trim hazard trees, and to maintain trees within public rights-of-way. Utility companies maintain trees along their utility easements.

City of McMinnville Codes Pertaining to Windstorms and Winter Storms

The following McMinnville codes, plans, and policies pertain to windstorms and winter storms:

1. The City of McMinnville Municipal Code Title 13 Public Utilities provides standards for public infrastructure and utilities.
2. The City of McMinnville enforces the [Oregon Building Code](#) which regulates building material requirements and includes provisions for windstorms and winter storms.

Please review Volume I, Section 2 for additional information on this hazard.

Volcanic Event

The steering committee determined that the City's probability for a volcanic event is **low** and that their vulnerability to a volcanic event is **low**.

Volume I, Section 2 describes the characteristics of volcanic hazards, history, as well as the location, extent, and probability of a potential event within the region. Generally, an event

that affects the Eastern portion of the County is likely to affect McMinnville as well. Several volcanoes are located near McMinnville, the closest of which are Mount Hood, Mount Adams, Mount Saint Helens, Mount Rainier, and the Three Sisters.

Due to McMinnville'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). Although the City of McMinnville is unlikely to experience lahars or lava flows, tephra (sand- sized or finer particles of volcanic rock that is ejected rapidly into the air from volcanic vents) drifts downwind from the explosions and can form a blanket-like deposit of ash. 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 heavier coating of ash. Tephra is a public health threat, and can damage agriculture and transportation systems (i.e., aircraft and on- the-ground vehicles). Tephra can also clog drainage systems and create major debris management problems. Within McMinnville, public health would be a primary concern, and keeping transportation routes open/accessible would be important as well.

Vulnerability Assessment

Due to insufficient data and resources, McMinnville is currently unable to perform a quantitative risk assessment, or exposure analysis, for this hazard.

Mitigation Activities

The existing volcanic event hazard mitigation activities are conducted at the county, regional, state, and federal levels and are described in the Yamhill County NHMP.

City of McMinnville Codes Pertaining to Volcanic Events

The City does not have specific codes, plans, or policies that pertain to volcanic events:

Please review Volume I, Section 2 for additional information on this hazard.

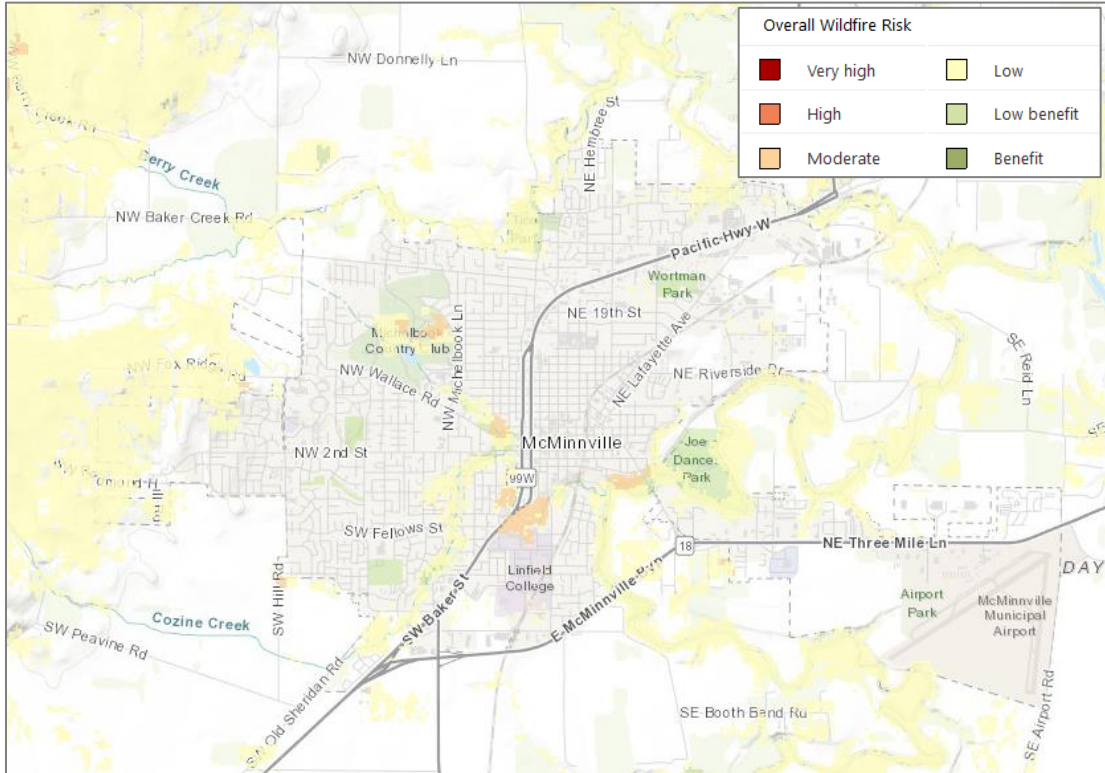
Wildfire

The steering committee determined that the City's probability for wildfire is **moderate** and that their vulnerability to wildfire is **moderate**.

The [Yamhill County Community Wildfire Protection Plan \(CWPP\)](#) was completed in August 2009 and revised in 2015. The CWPP is hereby incorporated into this NHMP addendum by reference, and it will serve as the wildfire section for this addendum.

Volume I, Section 2 describes the characteristics of wildland fire hazards, history, as well as the location, extent, and probability of a potential event within the region. The location, and extent of a wildland fire vary depending on fuel, topography, and weather conditions. Weather, and urbanization conditions are primarily at cause for the hazard level. McMinnville has not experienced a wildfire within City limits. The city is surrounded by developed land, rivers, and/or irrigated agricultural land. However, some wooded areas are a concern in the case of a wildfire event, particularly in the western part of the city. Figure MA-8 shows overall wildfire risk in McMinnville.

Figure MA-8 Overall Wildfire Risk



Source: [Oregon Wildfire Risk Explorer](#), date accessed April 27, 2020.

There have been several small wildfires in and surrounding the city since 1992. One 13-acre human caused wildfire occurred in the northeastern section of the city in 2015, in 2017 a wheat field caught fire near the Grandhaven Development, and in 2019 a 40-acre human caused fire occurred off Baker Creek Rd in the western part of the city. Additional, small wildfire have occurred (usually human caused) adjacent to the city and within the watershed.

The forested areas within, and surrounding McMinnville are interface areas. These areas are characterized by varying housing structures (often large houses on small lots, some with shake roofs), natural, and ornamental vegetation, and topography that may increase the risk for wildfire spreading (particularly to the north and northeast).

Most of the city has less severe (low) wildfire burn probability that includes expected flame lengths less than four feet under normal weather conditions.¹⁴ However, conditions vary widely and with local topography, fuels, and local weather (including wind) conditions. Under warm, dry, windy, and drought conditions expect higher likelihood of fire starts, higher intensity, more ember activity, and a more difficult to control wildfire that will include more fire effects and impacts. The potential community impacts, and vulnerabilities described in Volume I, Section 2 are generally accurate for the City as well. McMinnville’s fire response is provided by the McMinnville Fire Department. The CWPP assesses wildfire risk, maps wildland urban interface areas, and includes actions to mitigate wildfire risk (all

¹⁴ [Oregon Wildfire Risk Explorer](#),

identified actions are outside the city limits). However, several identified projects are located within, or near, the city's watershed including moderate priority hazard fuel reduction projects in the Baker Creek Area and Fox Ridge Area, and a high priority defensible space project Eagle Point Way. The City will update the City's wildfire risk assessment if the CWPP presents better data during future updates (an action item is included to participate in future updates to the CWPP).

Vulnerability Assessment

Due to insufficient data and resources, McMinnville is currently unable to perform a quantitative risk assessment for this hazard. The city's biggest wildfire vulnerability is in the west area of the city and adjoining lands and within the city's 6,350-acre watershed, owned McMinnville Water and Light (MW&L), located about 9 miles west of the city in the Coast Mountain Range. Overall, the watershed has low to moderate wildfire risk, however, the forested areas have the potential for large wildfires and a wildfire within the watershed could impact the city's water supply and quality.

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).

Exposed infrastructure including wastewater main lines, major water lines, natural gas pipeline and fiber optic lines are buried, decreasing their vulnerability to damage from wildfire hazards. However, wildfire conditions could potentially limit or delay access for the purposes of operation or repair.

The Oregon Wildfire Risk Explorer provides detail on the potential impact to structure from wildfire as shown in Figure MA-9, darker areas have higher potential impacts if fire ignites nearby. The areas of greater risk are generally located west of the city that are hillier and that are more heavily vegetated and forested.

Mitigation Activities

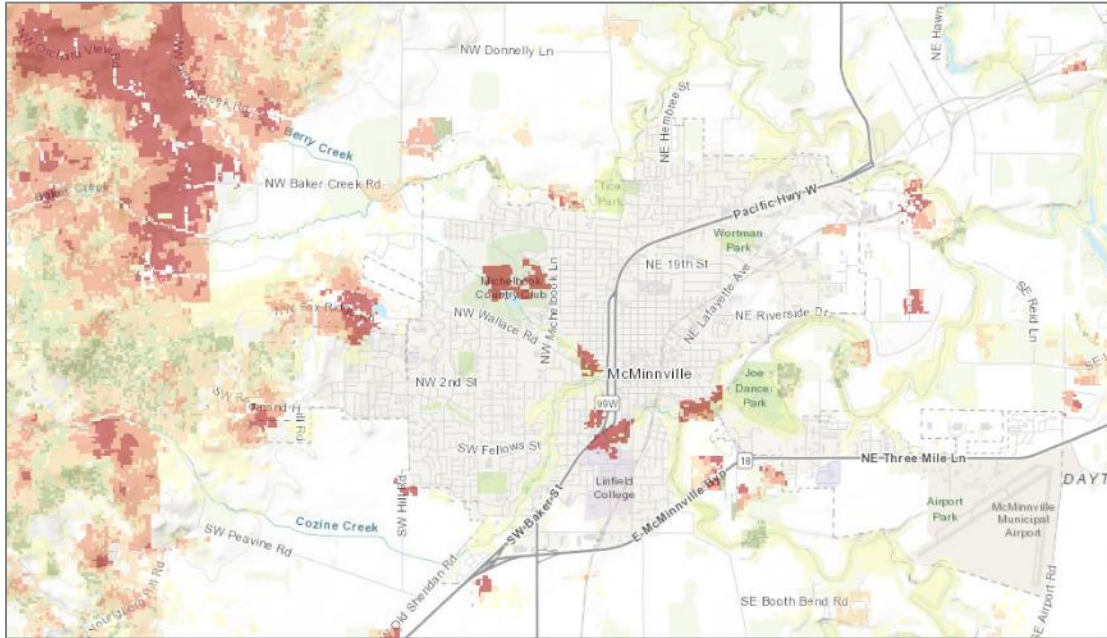
The McMinnville Fire Department works to mitigate problems regarding wildfire issues when they arise. Wildfire mitigation activities listed here include current mitigation programs and activities that are being implemented by McMinnville agencies or organizations. The Oregon Department of Forestry provides fire protection for the McMinnville Watershed.

City of McMinnville Codes Pertaining to Wildfires

The following McMinnville codes, plans, and policies pertain to wildfires:

1. McMinnville Comprehensive Plan (*under contract to update in 2020*). The updated plan includes a Natural Hazards Inventory and Management Program Recommendations including information on wildfire hazards impacting the city.
2. The City of McMinnville Municipal Code Title 13 provides standards for public infrastructure and utilities.
3. The City of McMinnville enforces the [Oregon Building Code](#) which regulates building material requirements and includes provisions for fires.

Figure MA-9 Overall Potential Impact



Source: [Oregon Wildfire Risk Explorer](#), date accessed April 27, 2020.

Please review the [Yamhill County Community Wildfire Protection Plan \(CWPP\)](#) and Volume I, Section 2 for additional information on this hazard.

ATTACHMENT A: ACTION ITEM FORMS

Table MA-1 provides a summary list of 2020 NHMP Actions for the city. Each high priority action item has a corresponding action item worksheet describing the activity, identifying the rationale for the project, identifying potential ideas for implementation, and assigning coordinating and partner organizations. The action item worksheets can assist the community in pre-packaging potential projects for grant funding. The worksheet components are described below.

ALIGNMENT WITH EXISTING PLANS/POLICIES

The City NHMP includes a range of action items that, when implemented, will reduce loss from hazard events in the City. Within the plan, FEMA requires the identification of existing programs that might be used to implement these action items. The City addresses statewide planning goals and legislative requirements through its comprehensive land use plan, capital improvements plan, mandated standards and building codes. To the extent possible, the City will work to incorporate the recommended mitigation action items into existing programs and procedures. Each action item identifies related existing plans and policies.

STATUS/RATIONALE FOR PROPOSED ACTION ITEM

Action items should be fact-based and tied directly to issues or needs identified throughout the planning process. Action items can be developed at any time during the planning process and can come from several sources, including participants in the planning process, noted deficiencies in local capability, or issues identified through the risk assessment. The rationale for proposed action items is based on the information documented in this addendum and within Volume I, Section 2. The worksheet provides information on the activities that have occurred since the previous plan for each action item.

IDEAS FOR IMPLEMENTATION

The ideas for implementation offer a transition from theory to practice and serve as a starting point for this plan. This component of the action item is dynamic, since some ideas may prove to not be feasible, and new ideas may be added during the plan maintenance process. Ideas for implementation include such things as collaboration with relevant organizations, grant programs, tax incentives, human resources, education and outreach, research, and physical manipulation of buildings and infrastructure.

COORDINATING (LEAD) ORGANIZATION:

The coordinating organization is the public agency with the regulatory responsibility to address natural hazards, or that is willing and able to organize resources, find appropriate funding, or oversee activity implementation, monitoring and evaluation.

INTERNAL AND EXTERNAL PARTNERS:

The internal and external partner organizations listed in the Action Item Worksheets are potential partners recommended by the project steering committee but not necessarily

contacted during the development of the plan. The coordinating organization should contact the identified partner organizations to see if they are capable of and interested in participation. This initial contact is also to gain a commitment of time and/or resources toward completion of the action items.

Internal partner organizations are departments within the City or other participating jurisdiction that may be able to assist in the implementation of action items by providing relevant resources to the coordinating organization.

External partner organizations can assist the coordinating organization in implementing the action items in various functions and may include local, regional, state, or federal agencies, as well as local and regional public and private sector organizations.

PLAN GOALS ADDRESSED:

The plan goals addressed by each action item are identified as a means for monitoring and evaluating how well the mitigation plan is achieving its goals, following implementation.

TIMELINE:

All broad scale action items have been determined to be ongoing, as opposed to short (0 to 2 years), medium (2-5 years), or long (6 or more years). This is because the action items are broad ideas, and although actions may be implemented to address the broad ideas, the efforts should be ongoing.

POTENTIAL FUNDING SOURCE

Where possible potential funding sources have been identified. Example funding sources may include: Federal Hazard Mitigation Assistance programs, state funding sources such as the Oregon Seismic Rehabilitation Grant Program, or local funding sources such as capital improvement or general funds. An action item may include several potential funding sources.

ESTIMATED COST

A rough estimate of the cost for implementing each action item is included. Costs are shown in general categories showing low, medium, or high cost. The estimated cost for each category is outlined below:

Low - Less than \$50,000

Medium - \$50,000 – \$100,000

High - More than \$100,000

Multi-Hazard #1

Proposed Action Item:		Alignment with Plan Goals:	
Develop, enhance, and implement public education and information materials concerning mitigation, preparedness and safety procedures for identified natural hazards.		Goal 1, Goal 2, Goal 3, Goal 6, Goal 8	
Alignment with Existing Plans/Policies:			
Emergency Operations Plan			
2020 Status/Rationale for Proposed Action Item:			
<p>The natural hazard sections of the City's addendum (Volume II) to the Yamhill Co. NHMP and Yamhill County's risk assessment (Volume I, Section 2 and Volume III, Appendix C) identify vulnerable populations and property within the various identified hazard areas. Increasing public outreach to educate residents about their risk to natural hazards affecting their community as well as what to do in the event of a natural hazard will help decrease their vulnerability to natural hazards.</p> <p>The Disaster Mitigation Act of 2000 requires communities to identify how the community will continue to involve the public in the plan maintenance process [201.6(c)(4)(iii)]. Educating landowners on how to mitigate the effects of natural hazards helps keep the public informed of what is being done with the plan, how the City is working to mitigate its risk to natural hazards, and allows for feedback and suggestions from the public for improving, updating, and maintaining the plan.</p>			
Ideas for Implementation:			
<p>Distribution of natural hazard information describing dangers and evacuation routes for visitors to McMinnville and continued educational outreach for residents and business owners.</p> <p>Update brochures with new information provided as part of reports provided by DOGAMI, ODF, DLCD, and FEMA (among others).</p> <p>Identify and use existing mechanisms for public outreach (e.g., SWCD, NRCS, watershed councils, OSU Extension, etc.).</p>			
Coordinating Organization:		Emergency management, MW&L	
Internal Partners:		External Partners:	
Planning, Public Works, Fire, Police		OEM, DLCD, FEMA, DOGAMI	
Potential Funding Sources:		Estimated cost:	Timeline:
General fund, grants		Low	<input type="checkbox"/> Short (0-2 years) <input type="checkbox"/> Medium (2-5 years) <input type="checkbox"/> Long (6+ years) <input checked="" type="checkbox"/> Ongoing
Form Submitted by:	2019-20 NHMP Steering Committee		
Priority:	High		

Multi-Hazard #2

Proposed Action Item:		Alignment with Plan Goals:	
Incorporate mitigation planning provisions into community planning processes such as comprehensive, capital improvement, land use, transportation plans, zoning ordinances, community development practices, etc.		Goal 1, Goal 4, Goal 5, Goal 6, Goal 7, Goal 8	
Alignment with Existing Plans/Policies:			
Comprehensive Plan, Development Code, Master Plans (Water/Wastewater), Transportation System Plan			
2020 Status/Rationale for Proposed Action Item:			
<p>Comprehensive plans provide the framework for the physical design of a community. They shape overall growth and development while addressing economic, environmental and social issues. Oregon’s statewide goals are accomplished through local comprehensive plans. State Law requires local governments to adopt a comprehensive plan and the zoning and land-division ordinances needed to put the plan into action.</p> <p>Integration of NHMPs into comprehensive plans and other plans will help to reduce a community’s vulnerability to natural hazards, support in mitigation activities, help to increase the speed in which action items are implemented and therefore the speed in which communities recover from natural disasters.</p> <p>Integration of NHMPs into local plans gives the action items identified in the NHMP legal status for guiding local decision-making regarding land use and/ or capital expenditures. .</p>			
Ideas for Implementation:			
<p>Conduct a policy crosswalk of the NHMP, the comprehensive plan, and other planning documents, to identify areas of possible integration.</p> <p>Integrate natural hazards information and policies into the comprehensive plan and other plans.</p> <p>Engage in collaborative planning and integration.</p> <p>Coordinate future NHMP and comprehensive plan reviews and updates.</p>			
Coordinating Organization:		Planning	
Internal Partners:		External Partners:	
Engineering, MW&L		DOGAMI, DLCD, OEM	
Potential Funding Sources:		Estimated cost:	Timeline:
General fund, DLCD technical assistance grant		Low	<input checked="" type="checkbox"/> Short (0-2 years) <input type="checkbox"/> Medium (2-5 years) <input type="checkbox"/> Long (6+ years) <input type="checkbox"/> Ongoing
Form Submitted by:	2019-20 NHMP Steering Committee		
Priority:	High		

Multi-Hazard #6

Proposed Action Item:		Alignment with Plan Goals:	
Develop and maintain GIS mapped critical facility inventory.		Goal 1, Goal 2, Goal 3, Goal 4, Goal 6, Goal 8	
Alignment with Existing Plans/Policies:			
2020 Status/Rationale for Proposed Action Item:			
<p>McMinnville’s addendum and Yamhill County’s risk assessment identify limited properties located in hazards areas. Improving technology, particularly GIS and communications, for the identification of vulnerable facilities will help decrease their vulnerability to natural hazards.</p> <p>The Disaster Mitigation Act of 2000 requires communities to identify how the community will continue to involve the public in the plan maintenance process [201.6(c)(4)(iii)]. Improving technology capacity will allow more widespread dissemination of information, thus assisting in keeping residents informed of what is being done with the plan, how the City is working to mitigate its risk to natural hazards and allowing for feedback and suggestions from the public for improving, updating, and maintaining the plan.</p>			
Ideas for Implementation:			
<p>Identify and map critical facilities and identify the location and extent of hazard areas and establish a factual base to support implementation of future mitigation measures; and</p> <p>Analyze the risk of these areas to property, and infrastructure.</p>			
Coordinating Organization:		Engineering, MW&L	
Internal Partners:		External Partners:	
Planning, Fire, Police		DOGAMI, DLCD, ODF, other state and federal agencies	
Potential Funding Sources:		Estimated cost:	Timeline:
General fund, grants		Low	<input checked="" type="checkbox"/> Short (0-2 years) <input type="checkbox"/> Medium (2-5 years) <input type="checkbox"/> Long (6+ years) <input type="checkbox"/> Ongoing
Form Submitted by:	2019-20 NHMP Steering Committee		
Priority:	High		

Multi-Hazard #7

Proposed Action Item:		Alignment with Plan Goals:	
Develop and maintain GIS mapped hazard areas within the UGB.		Goal 1, Goal 2, Goal 3, Goal 4, Goal 6, Goal 8	
Alignment with Existing Plans/Policies:			
Comprehensive Plan			
2020 Status/Rationale for Proposed Action Item:			
<p>The Risk Assessment section of the McMinnville NHMP addendum identifies the potential hazard risk areas within the city.</p> <p>The Disaster Mitigation Act of 2000 requires communities to identify actions and projects that reduce the effects of hazards on both new and existing buildings and infrastructure [201.6(c)(3)(ii)]. Identifying and mapping existing areas with exposure to profiled natural hazard risk will allow for better understanding of the areas at risk and for the implementation of mitigation measures to reduce this risk.</p>			
Ideas for Implementation:			
<p>Collect existing available GIS data for profiled natural hazards from state and federal partners. Data is available for geohazards on the DOGAMI website publications search: https://www.oregongeology.org/pubs/pubsearch.htm</p>			
Coordinating Organization:		Engineering, MW&L	
Internal Partners:		External Partners:	
Planning, Fire, Police		DOGAMI, USGS, FEMA, DLCD, ODF	
Potential Funding Sources:		Estimated cost:	Timeline:
General fund, grants		Low	<input checked="" type="checkbox"/> Short (0-2 years) <input type="checkbox"/> Medium (2-5 years) <input type="checkbox"/> Long (6+ years) <input type="checkbox"/> Ongoing
Form Submitted by:		2019-20 NHMP Steering Committee	
Priority:		High	

Multi-Hazard #8

Proposed Action Item:		Alignment with Plan Goals:	
Develop & construct multi-jurisdictional fuel station and mobile fuel capabilities.		Goal 1, Goal 2, Goal 3, Goal 4, Goal 6, Goal 8	
Alignment with Existing Plans/Policies:			
2020 Status/Rationale for Proposed Action Item:			
A multi-jurisdictional fueling station coupled with mobile fueling capacity will provide more reliable and redundant fuel supply to participating partners during emergency response operations.			
Ideas for Implementation:			
McMinnville Water & Light is advancing plans to construct a fueling station during fiscal year 2021 and is working with the City regarding its ability to participate.			
Coordinating Organization:		Engineering, MW&L	
Internal Partners:		External Partners:	
Planning, Fire, Police		ODOT, Yamhill Co, other cities in Yamhill County	
Potential Funding Sources:		Estimated cost:	Timeline:
General fund, MW&L		High	<input checked="" type="checkbox"/> Short (0-2 years) <input type="checkbox"/> Medium (2-5 years) <input type="checkbox"/> Long (6+ years) <input type="checkbox"/> Ongoing
Form Submitted by:	2019-20 NHMP Steering Committee		
Priority:	High		

Multi-Hazard #1 I

Proposed Action Item:		Alignment with Plan Goals:	
Limit (e.g. reduced density, etc.) or prohibit development in high hazard areas.		Goal 2, Goal 3, Goal 4, Goal 6, Goal 7, Goal 8	
Alignment with Existing Plans/Policies:			
Comprehensive Plan, Development Code, Strategic Plan			
2020 Status/Rationale for Proposed Action Item:			
The Disaster Mitigation Act of 2000 requires communities to identify actions and projects that reduce the effects of hazards on both new and existing buildings and infrastructure [201.6(c)(3)(ii)]. Limiting and prohibiting development in high hazards zones will reduce risk to people and property.			
Ideas for Implementation:			
Complete, adopt and implement the “McMinnville Area Natural Hazards Inventory and Management Program Recommendations” plan, which will include an inventory of natural hazards based on available mapping sources; consider alternative management options; and suggest policy and mapping amendments to the McMinnville Comprehensive Plan to systematically address McMinnville’s mappable natural hazards.			
Coordinating Organization:		Planning	
Internal Partners:		External Partners:	
Engineering		DLCD	
Potential Funding Sources:		Estimated cost:	Timeline:
General fund		Low	<input checked="" type="checkbox"/> Short (0-2 years) <input type="checkbox"/> Medium (2-5 years) <input type="checkbox"/> Long (6+ years) <input type="checkbox"/> Ongoing
Form Submitted by:		2019-20 NHMP Steering Committee	
Priority:		High	

Multi-Hazard #12

Proposed Action Item:		Alignment with Plan Goals:	
Encourage mitigation practices in developments at risk to natural hazards.		Goal 1, Goal 2, Goal 3, Goal 4, Goal 6, Goal 8	
Alignment with Existing Plans/Policies:			
Comprehensive Plan, Development Code, Strategic Plan			
2020 Status/Rationale for Proposed Action Item:			
The Disaster Mitigation Act of 2000 requires communities to identify actions and projects that reduce the effects of hazards on both new and existing buildings and infrastructure [201.6(c)(3)(ii)]. Encouraging the use of mitigation techniques to limit risk to natural hazards will reduce risk to people and property.			
Ideas for Implementation:			
Complete, adopt and implement the “McMinnville Area Natural Hazards Inventory and Management Program Recommendations” plan, which will include an inventory of natural hazards based on available mapping sources; consider alternative management options; and suggest policy and mapping amendments to the McMinnville Comprehensive Plan to systematically address McMinnville’s mappable natural hazards.			
Coordinating Organization:		Planning	
Internal Partners:		External Partners:	
Engineering		DLCD	
Potential Funding Sources:		Estimated cost:	Timeline:
General fund		Low	<input checked="" type="checkbox"/> Short (0-2 years) <input type="checkbox"/> Medium (2-5 years) <input type="checkbox"/> Long (6+ years) <input type="checkbox"/> Ongoing
Form Submitted by:	2019-20 NHMP Steering Committee		
Priority:	High		

Earthquake #1

Proposed Action Item:		Alignment with Plan Goals:	
Complete inventory and seismic assessment of critical facilities.		Goal 2, Goal 3, Goal 4, Goal 6, Goal 7, Goal 8	
Alignment with Existing Plans/Policies:			
2020 Status/Rationale for Proposed Action Item:			
<p>Currently, all new facilities must comply with and meet seismic standards. If someone moves into an old building, they must upgrade to current standards.</p> <p>DOGAMI did a windshield survey of schools, fire stations, police, and city halls (2007 RVS). The focus was on action of existing buildings and information was shared with participants.</p> <p>Seismic resiliency is a component of MW&L's collection system and the city's wastewater treatment facility master plans. Upgrades are constructed as opportunity and funding allow.</p>			
Ideas for Implementation:			
<p>Provide information to government building and school facility managers and teachers on nonstructural mitigation techniques including: securing bookcases, filing cabinets, light fixtures, and other objects that can cause injuries and block exits;</p> <p>Encourage facility managers, business owners, and teachers to refer to FEMA's practical guidebook: Reducing the Risks of Nonstructural Earthquake Damage;</p> <p>Encourage homeowners and renters to use Is Your Home Protected from Earthquake Disaster? A Homeowner's Guide to Earthquake Retrofit (IBHS) for economic and efficient mitigation techniques;</p> <p>Use the FEMA 154 seismic evaluations generated by DOGAMI to prioritize critical and essential buildings for upgrades;</p> <p>Explore partnerships to provide retrofitting classes for homeowners, renters, building professionals, and contractors; and</p> <p>Target development located in potential fault zones or in unstable soils for intensive education and retrofitting resources.</p>			
Coordinating Organization:		Engineering, MW&L	
Internal Partners:		External Partners:	
Fire, Planning		School district	
Potential Funding Sources:		Estimated cost:	Timeline:
General fund, utility fees, HMA grants		High	<input checked="" type="checkbox"/> Short (0-2 years) <input type="checkbox"/> Medium (2-5 years) <input type="checkbox"/> Long (6+ years) <input type="checkbox"/> Ongoing
Form Submitted by:	2019-20 NHMP Steering Committee		
Priority:	High		

Landslide #2

Proposed Action Item:		Alignment with Plan Goals:	
Develop a process to limit future development in high landslide potential areas - permitting, geotechnical review, soil stabilization techniques, etc.		Goal 2, Goal 4, Goal 5, Goal 6, Goal 7, Goal 8	
Alignment with Existing Plans/Policies:			
Comprehensive Plan, Development Code, Strategic Plan			
2020 Status/Rationale for Proposed Action Item:			
The Disaster Mitigation Act of 2000 requires communities to identify actions and projects that reduce the effects of hazards on both new and existing buildings and infrastructure [201.6(c)(3)(ii)]. Identifying existing landslide hazard areas will allow for a better understanding of the area at risk and the implementation of mitigation measures to reduce this risk.			
Ideas for Implementation:			
Complete, adopt and implement the “McMinnville Area Natural Hazards Inventory and Management Program Recommendations” plan, which will include an inventory of natural hazards based on available mapping sources; consider alternative management options; and suggest policy and mapping amendments to the McMinnville Comprehensive Plan to systematically address McMinnville’s mappable natural hazards.			
Incorporate relevant aspects of the DLCD Landslide Land Use Guide (“ Preparing for Landslide Hazards, A Land Use Guide for Oregon Communities ”)			
Coordinating Organization:		Planning	
Internal Partners:		External Partners:	
Engineering, McMinnville Water & Light		DLCD, DOGAMI	
Potential Funding Sources:		Estimated cost:	Timeline:
General fund, Utility Fees, grants		Medium	<input checked="" type="checkbox"/> Short (0-2 years) <input type="checkbox"/> Medium (2-5 years) <input type="checkbox"/> Long (6+ years) <input type="checkbox"/> Ongoing
Form Submitted by:	2019-20 NHMP Steering Committee		
Priority:	High		

Wildfire #1

Proposed Action Item:		Alignment with Plan Goals:	
Coordinate wildfire mitigation action items through the Yamhill County Community Wildfire Protection Plan.		Goal 1, Goal 2, Goal 3, Goal 4, Goal 5, Goal 6, Goal 7, Goal 8	
Alignment with Existing Plans/Policies:			
Yamhill County CWPP			
2020 Status/Rationale for Proposed Action Item:			
The wildfire mitigation action items provide direction on specific activities that organizations and residents in McMinnville/Yamhill County can take to reduce wildfire hazards.			
Ideas for Implementation:			
Implement high and medium priority projects including defensible space and fuels reduction projects identified in the CWPP.			
Coordinating Organization:		Fire	
Internal Partners:		External Partners:	
Planning, Emergency Management, MW&L		ODF, USFS, Fire Defense Board	
Potential Funding Sources:		Estimated cost:	Timeline:
General fund, ODF grants		Medium to High	<input type="checkbox"/> Short (0-2 years) <input type="checkbox"/> Medium (2-5 years) <input type="checkbox"/> Long (6+ years) <input checked="" type="checkbox"/> Ongoing
Form Submitted by:	2019-20 NHMP Steering Committee		
Priority:	High		

Wildfire #2

Proposed Action Item:		Alignment with Plan Goals:	
Provide wildland fire information in an easily distributed format for all residents.		Goal 1, Goal 2, Goal 3, Goal 6, Goal 8	
Alignment with Existing Plans/Policies:			
2020 Status/Rationale for Proposed Action Item:			
<p>The natural hazard sections of the City’s addendum (Volume II) to the Yamhill Co. NHMP and Yamhill County’s risk assessment (Volume I, Section 2 and Volume III, Appendix C) identify vulnerable populations and property within the wildfire hazard area. Increasing public outreach to educate residents about their risk to natural hazards affecting their community as well as what to do in the event of a natural hazard will help decrease their vulnerability to natural hazards.</p> <p>The Disaster Mitigation Act of 2000 requires communities to identify how the community will continue to involve the public in the plan maintenance process [201.6(c)(4)(iii)]. Educating landowners on how to mitigate the effects of natural hazards helps keep the public informed of what is being done with the plan, how the City is working to mitigate its risk to natural hazards, and allows for feedback and suggestions from the public for improving, updating, and maintaining the plan.</p>			
Ideas for Implementation:			
<p>Distribution of wildfire hazard information describing dangers and evacuation routes for visitors to McMinnville and continued educational outreach for residents and business owners.</p> <p>Update brochures with new information provided as part of reports provided by Firewise, ODF, DOGAMI, DLCD, and FEMA (among others).</p> <p>Identify and use existing mechanisms for public outreach (e.g., SWCD, NRCS, watershed councils, OSU Extension, etc.).</p>			
Coordinating Organization:		Fire	
Internal Partners:		External Partners:	
Planning, Emergency Management, MW&L		ODF, USFS, Fire Defense Board	
Potential Funding Sources:		Estimated cost:	Timeline:
General fund, utility fees		Low	<input type="checkbox"/> Short (0-2 years) <input type="checkbox"/> Medium (2-5 years) <input type="checkbox"/> Long (6+ years) <input checked="" type="checkbox"/> Ongoing
Form Submitted by:	2019-20 NHMP Steering Committee		
Priority:	High		

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ATTACHMENT B: PUBLIC INVOLVEMENT SUMMARY

Members of the steering committee provided edits and updates to the NHMP prior to the public review period as reflected in the final document.

To provide the public information regarding the draft NHMP addendum, and provide an opportunity for comment, an announcement (see text below) was placed on the city's website and an email contact was provided for public comment. The press release was also provided to the local newspaper (News Register) and was posted on the city's social media pages (Facebook, Instagram).

During the public review period there were no comments provided.

The screenshot shows the City of McMinnville website. The header includes the city name and navigation links: Home, Contact Us, Code Compliance & Community Relations, and a language selector. A red navigation bar contains links for GOVERNMENT, BUSINESS, COMMUNITY, and I WANT TO, along with a search bar. The main content area features a green headline: "Press Release for McMinnville addendum to the Yamhill County Multi-Jurisdictional Natural Hazard Mitigation Plan Update – Notice and Opportunity for Public Comment". Below this is a "Supporting Documents" section with two links: "Press Release - McMinnville seeks additional public input on update to Natural Hazard Mitigation Plan (41 KB)" and "City of McMinnville Addendum to the Yamhill County Multi-Jurisdictional Hazard Mitigation Plan - DRAFT (10 MB)". On the right side, there is a "Community" section with a "Get Involved!" button and a "Contact Information" box listing Noelle Amaya, Community Engagement & Public Affairs, with address and phone number, and a link to "View Full Contact Details".



PRESS RELEASE

DATE: June 29, 2020

SUBJECT: Press Release for McMinnville addendum to the Yamhill County Multi-Jurisdictional Natural Hazard Mitigation Plan Update – Notice and Opportunity for Public Comment

For Immediate Release

McMinnville seeks additional public input on update to Natural Hazard Mitigation Plan

(McMinnville, OR) – McMinnville is in the process of updating their existing Natural Hazard Mitigation Plan (NHMP). This work is being performed in cooperation with the University of Oregon’s Institute for Policy Research and Engagement - Oregon Partnership for Disaster Resilience and the Oregon Military Department’s Office of Emergency Management utilizing funds obtained from the Federal Emergency Management Agency’s (FEMA) Pre-Disaster Mitigation Grant Program. With re-adoption of the plan, McMinnville will regain its eligibility to apply for federal funding towards natural hazard mitigation projects. This local planning process includes a wide range of representatives from city and county government, emergency management personnel, and outreach to members of the public in the form of an electronic survey.

A natural hazard mitigation plan provides communities with a set of goals, action items, and resources designed to reduce risk from future natural disaster events. Engaging in mitigation activities provides jurisdictions with a number of benefits, including reduced loss of life, property, essential services, critical facilities, and economic hardship; reduced short-term and long-term recovery and reconstruction costs; increased cooperation and communication within the community through the planning process; and increased potential for state and federal funding for recovery and reconstruction projects.

An electronic version of the updated draft McMinnville NHMP addendum will be available for formal public comment beginning June 29, 2020. To view the draft please visit the “Latest News” section of the City’s website: <https://www.mcminnvilleoregon.gov/>

If you have any questions regarding the McMinnville NHMP addendum or the update process in general, please contact: Mike Bisset, Community Development Director at (503) 434-7312 or mike.bisset@mcminnvilleoregon.gov; or Michael Howard, Assistant Program Director for the Oregon Partnership for Disaster Resilience at mrhoward@uoregon.edu.

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City of Newberg Addendum to the Yamhill County Multi-Jurisdictional Hazard Mitigation Plan



Effective: December 22, 2020 through December 21, 2025

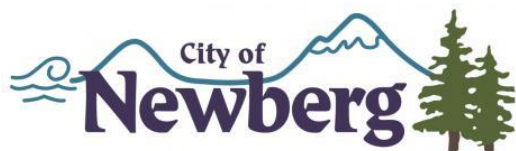
Prepared for:

City of Newberg

Prepared by:

University of Oregon

**Institute for Policy Research and Engagement
Oregon Partnership for Disaster Resilience**



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FEMA

January 20, 2021

The Honorable Casey Kulla
Chair Kulla, Yamhill County Board of Commissioners
535 NE 5th St.
McMinnville, Oregon 97128

Dear Chair Kulla:

On December 22, 2020, the U.S. Department of Homeland Security's Federal Emergency Management Agency (FEMA) Region 10, approved the Yamhill County Hazard Mitigation Plan as a multi-jurisdictional local plan as outlined in Code of Federal Regulations Title 44 Part 201. This approval provides the below jurisdictions eligibility to apply for the Robert T. Stafford Disaster Relief and Emergency Assistance Act's, Hazard Mitigation Assistance grants projects through December 21, 2025, through your state:

Yamhill County	City of Amity	City of Carlton	City of Dayton
City of McMinnville	City of Newberg	City of Sheridan	City of Yamhill

FEMA individually evaluates all application requests for funding according to the specific eligibility requirements of the applicable program. Though a specific mitigation activity or project identified in the plan may meet the eligibility requirements, it may not automatically receive approval for FEMA funding under any of the aforementioned programs.

Approved mitigation plans may be eligible for points under the National Flood Insurance Program's Community Rating System (CRS). For additional information regarding the CRS, please visit: www.fema.gov/national-flood-insurance-program-community-rating-system or contact your local floodplain manager. Over the next five years, we encourage your communities to follow the plan's schedule for monitoring and updating, and to develop further mitigation actions. To continue eligibility, jurisdictions must review, revise as appropriate, and resubmit the plan within five years of the original approval date.

If you have questions regarding your plan's approval or FEMA's mitigation grant programs, please contact Joseph Murray, Planner with Oregon Office of Emergency Management, at (503) 378-2911, who locally coordinates and administers these efforts.

Sincerely,

Kristen Meyers, Director
Mitigation Division

Enclosure

cc: Amie Bashant, Oregon Office of Emergency Management

EG:vl

PURPOSE

1. City Council Resolution No. 2013-3102 authorized the emergency manager to make necessary updates to the Emergency Operation Plan.
2. The City Manager is currently the designated Emergency Manager for the City of Newberg.
3. The Natural Hazard Mitigation Plan is part of the EOP and updates are required by FEMA, OEM, Yamhill County to be reviewed every 5 years and updated to remain current.
4. FEMA requires these updates in order for the City to qualify for FEMA Emergency Grant funding.
5. The plan has been reviewed and updated in coordination with city staff, a consultant from University of Oregon, and the Yamhill County Emergency Managers office.
6. The plan was placed out for public comment for 14 days July 2020 and no questions or comments were received.

EXECUTIVE ORDER

- 1.1 The revised 2020 Natural Hazard Mitigation Plan for the City of Newberg is hereby adopted into the City EOP document for emergency planning purposes and replaces any previous versions.


APPLICABILITY

- 2.1 This Executive Order applies to The City of Newberg Natural Hazard Mitigation Plan as part of the City of Newberg Emergency Operations Plan. There is no financial impact because of the changes made.

OTHER EXPLANATION

- 3.1 The EOP is a living, working document and can be updated as necessary by the emergency manager or city manager to reflect changes, such as current staffing, resources, geographic descriptions, current events, and other items necessary to keep the EOP current.

DATED this 9th day of September 2020.



Dan Weinheimer,
City Manager

Purpose

This is an update of the Newberg addendum to the Yamhill County Multi-Jurisdictional Natural Hazard Mitigation Plan (NHMP). This addendum supplements information contained in Volume I (Basic Plan) which serves as the NHMP foundation, and Volume III (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 Newberg's addendum are further discussed throughout the NHMP, and within Volume III, Appendix B, which provides an overview of alterations to the document that took place during the update process.

Newberg adopted their addendum to the Yamhill County Multi-jurisdictional NHMP on **September 9, 2020**. FEMA Region X approved the Yamhill County NHMP and the City's addendum on **December 22, 2020**. With approval of this NHMP the City is now eligible to apply for the Robert T. Stafford Disaster Relief and Emergency Assistance Act's hazard mitigation project grants through **December 21, 2025**.

Mitigation Plan Mission

The NHMP mission states the purpose and defines the primary functions of the 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 City concurs with the mission statement developed during the Yamhill County planning process (Volume I, Section 3):

To promote public policy and mitigation activities which will enhance the safety to life and property from natural hazards.

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

Mitigation Plan Goals

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

The City concurs with the goals developed during the Yamhill County planning process (Volume I, Section 3). All NHMP goals are important and are listed below in no 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.

Below is a list of the NHMP goals:

GOAL 1: EMERGENCY OPERATIONS

- Coordinate natural hazard mitigation activities, where appropriate, with emergency operations plans and procedures and with other agencies.

GOAL 2: EDUCATION AND OUTREACH

- Develop and implement education and outreach programs to increase public awareness of the risks associated with natural hazards.

GOAL 3: PARTNERSHIPS

- Develop effective partnerships with public and private sector organizations and significant agencies and businesses for future natural hazard mitigation efforts.
- Coordinate natural hazard mitigation actions between the County and local jurisdictions to create more cohesive and effective hazard mitigation efforts.

GOAL 4: PREVENTIVE

- Develop and implement activities to protect human life, commerce, and property from natural hazards.
- Reduce losses and repetitive damage for chronic hazard events while promoting insurance coverage for catastrophic hazards.

GOAL 5: NATURAL RESOURCES UTILIZATION

- Link natural resources management, land use planning, and watershed planning with natural hazard mitigation activities to protect natural systems and allow them to serve natural hazard mitigation functions.

GOAL 6: IMPLEMENTATION

- Implement strategies to mitigate the effects of natural hazards and increase the quality of life and resilience of economies in Yamhill County.

GOAL 7: DEVELOPMENT

- Communities appropriately apply development standards that consider the potential impacts of natural hazards.

GOAL 8: DOCUMENTATION

- Document and evaluate progress in achieving hazard mitigation strategies and action items.

Process and Participation

This section of the NHMP addendum addresses 44 CFR 201.6(a)(3), *Participation*.

In addition to establishing a comprehensive community-level mitigation strategy, the Disaster Mitigation Act of 2000 (DMA2K), and the regulations contained in 44 CFR 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 pre-, and post-disaster mitigation project grants.

The Oregon Partnership for Disaster Resilience (OPDR) at the University of Oregon's Institute for Policy Research and Engagement (IPRE) collaborated with the Oregon Office of Emergency Management (OEM), Yamhill County, and Newberg to update their NHMP. This project is funded through the Federal Emergency Management Agency's (FEMA) Hazard Mitigation Grant Program for DR-4328 (HMGP-DR-4328-OR-5-P). Members of the Newberg NHMP Steering committee also participated in the County NHMP update process (Volume III, Appendix B).

The Yamhill County NHMP, and Newberg addendum, are the result of a collaborative effort between citizens, public agencies, non-profit organizations, the private sector, and regional organizations. The Newberg NHMP Steering Committee guided the process of developing the NHMP.

Convener and Committee

The Newberg Public Works Director served as the NHMP addendum convener for the 2019-2020 update. The City Manager will be the convener for plan implementation, maintenance, and future updates. The convener of the NHMP will take the lead in implementing, maintaining, and updating the addendum to the Yamhill County NHMP in collaboration with the designated convener of the Yamhill County NHMP (Yamhill County Emergency Manager).

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

This addendum reflects decisions made at the designated meetings, and during subsequent work, and communication with Yamhill County Emergency Manager, and 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, action items, and community profile.

The Newberg steering committee was comprised of the following representatives:

- Convener, Jay Harris, Public Works Director (*former*)
- Karen Tarmichael, Project Specialist
- Dan Weinheimer, City Manager

Public Participation

Public participation was achieved by posting the NHMP publicly and providing community members the opportunity to make comments and suggestions during the review process. Community members were also provided an opportunity for comment via a survey administered by IPRE (Volume III, Appendix F). During the City public review period (Attachment B) there were no comments provided.

Implementation and Maintenance

The City Council will be responsible for adopting the Newberg addendum to the Yamhill County NHMP. This addendum designates the 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 Newberg 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 Manager 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; 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 City will utilize the same action item prioritization process as the County (Volume I, Section 4).

Implementation through Existing Programs

This NHMP is strategic and non-regulatory in nature, meaning that it does not necessarily set forth any new policy. It does, however, provide: (1) a foundation for coordination and collaboration among agencies and the public in the city; (2) identification and prioritization of future mitigation activities; and (3) aid in meeting federal planning requirements and qualifying for assistance programs. The mitigation plan works in conjunction with other city plans and programs including the Comprehensive Land Use Plan, Capital Improvements Plan, and Building Codes, as well as the [Yamhill County NHMP](#), and the [State of Oregon NHMP](#).

The mitigation actions described herein (and priority actions in Attachment A) 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, Newberg 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. Implementation opportunities are further defined in action items when applicable.

Future development without proper planning may result in worsening problems associated with natural hazards. Newberg's acknowledged comprehensive plan is the City of Newberg Comprehensive Plan. The City implements the plan through the Community Development Code.

Newberg currently has the following plans that relate to natural hazard mitigation. For a complete list visit the City's [website](#):

- [Comprehensive Plan](#) (1979, amended 2018)
- [Newberg Community Development Code, and City Code \(revised February 2020\)](#)
 - Chapter 8.20 Obnoxious Vegetation/Fire Hazard
 - Chapter 13 Public Utilities and Services
 - Chapter 15 Development Code
 - Chapter 15.342 Stream Corridor Overlay District
 - Chapter 15.343 Areas of Special Flood Hazard Area
 - Chapter 15.430 Underground Utility Installation
- Building Code, [2017 Oregon State Building Code](#) based on 2015 International Residential Code (IRC), and 2012 International Building Code (*to be updated to the 2020 Oregon State Building Code, anticipated October 2020*)
- [Emergency Operations Plan](#) (updated 2013)
- [2036 Transportation System Plan](#) (2016)

Other plans:

- [Yamhill County Community Wildfire Protection Plan](#) (2009, revised Nov. 2015)
- [TVF&R Strategic Plan](#) (2018)

Government Structure

The Newberg City Charter establishes a Mayor-Council-Manager form of government, which vests policy authority in a volunteer City Council, and administrative authority for day-to-day operations in an appointed, professional City Manager. The Newberg City Council consists of a Mayor and six Councilors who serve four-year terms. At least three Council positions are up for election every two years. Councilors are elected at-large. The three candidates who receive the highest number of votes are elected to the vacant seats. The Council meets at least once per month at City Hall. The agenda of each meeting includes time for citizen comment.

The City of Newberg currently has the following departments which have a role in natural hazard mitigation:

Fire protection is provided by Tualatin Valley Fire & Rescue which includes emergency response to more than 530,446 residents in several cities and unincorporated areas of Yamhill, Multnomah, Clackamas, and Washington counties. Emergency services include fire suppression, emergency medical response, hospital ambulance transportation, water and

dive rescue operations, hazardous materials incidents, and disaster response. Non-emergency services include fire prevention and inspection services, code enforcement, public safety education services/CPR training, fire extinguisher use, residential safety surveys, home fire escape planning, emergency and disaster preparedness planning and training for citizens (CERT), and fire and life safety education in Newberg schools.

Public Works provides many of the basic urban services to the citizens of Newberg, including water, sanitary sewer, and storm drainage systems, and their maintenance and repair. The Department is divided into three divisions: Maintenance, Operations, and Engineering.

Community Development includes Building and Planning divisions. The Planning division is responsible for all long range and current planning for new development, as well as the City's natural resource, geologic hazard and floodplain overlay zones. It is also responsible for implementation of the Comprehensive Plan. The Building division is responsible for plan review and inspections on commercial, industrial and residential developments, as well as fire life and safety plan review.

Police is a full-service law enforcement organization dedicated to the citizens of the City of Newberg and the City of Dundee. The Department is made up sworn officers and non-sworn personnel.

Emergency Management coordinates emergency preparedness, mitigation, response and recovery efforts for Newberg during emergencies, disasters, or disruptions.

Continued Public Participation

An open public involvement process is essential to the development of an effective NHMP. To develop a comprehensive approach to reducing the effects of natural disasters, the planning process shall include opportunities for the public, neighboring communities, local, and regional agencies, as well as, private, and non-profit entities to comment on the NHMP during review.¹ Keeping the public informed of efforts to reduce its risk to future natural hazard events is important for successful NHMP implementation, and maintenance. As such, the City is committed to involving the public in the NHMP review and update process (Volume I, Section 4). The City posted the plan update for public comment before FEMA approval, and after approval will maintain the plan on the City's website:

<https://www.newbergoregon.gov/citymanager/page/about-emergency-management>.

NHMP Maintenance

The Yamhill County NHMP, and City addendum will be updated every five years in accordance with the update schedule outlined in the Disaster Mitigation Act of 2000. During the County NHMP update process, the City will also review, and update its addendum (Volume I, Section 4). The convener will be responsible for convening the steering committee to address the questions outlined below.

- Are there new partners that should be brought to the table?

¹ Code of Federal Regulations, Chapter 44. Section 201.6, subsection (b). 2015

- Are there new local, regional, state or federal policies influencing natural hazards that should be addressed?
- Has the community successfully implemented any mitigation activities since the NHMP was last updated?
- Have new issues or problems related to hazards been identified in the community?
- Are the actions still appropriate given current resources?
- Have there been any changes in development patterns that could influence the effects of hazards?
- Have there been any significant changes in the community's demographics that could influence the effects of hazards?
- Are there new studies or data available that would enhance the risk assessment?
- Has the community been affected by any disasters? Did the NHMP accurately address the impacts of this event?

These questions will help the steering committee determine what components of the mitigation plan need updating. The steering committee will be responsible for updating any deficiencies found in the NHMP.

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) were first developed during the 2009 NHMP planning process and revised during subsequent NHMP updates. During these processes, the steering committee assessed the City's risk, identified potential issues, and developed a mitigation strategy (action items).

During the 2019-2020 update process the City re-evaluated their mitigation strategy (action items). During this process action items were updated, noting what accomplishments had been made, and whether the actions were still relevant; any new action items were identified at this time (see Volume III, Appendix B for more information on changes to action items).

Priority Action Items

Table NA-1 presents a list of mitigation actions. The steering committee 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 in **bold** text with grey 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 steering committee in terms of implementation, the steering committee 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 detailed information for each high priority action. Full text of the plan goals referenced in Table NA-1 is located on page NA-2.

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Table NA-I Newberg Action Items

Natural Hazard Action ID	Action Item	Coordinating Organization (Lead)	Partners	Potential Funding	Cost	Timing	Plan Goals Addressed							
							Goal 1	Goal 2	Goal 3	Goal 4	Goal 5	Goal 6	Goal 7	Goal 8
Multi-Hazard Actions														
Multi-Hazard #1	Develop, enhance, and implement public education and information materials concerning mitigation, preparedness and safety procedures for identified natural hazards.	TVF&R, Emergency Management	Public Works	General fund, grants	L	Ongoing	✓	✓	✓			✓	✓	
Multi-Hazard #2	Integrate the Mitigation Plan findings into planning & regulatory documents & programs and into enhanced emergency planning.	Planning	Emergency Management	General fund, utility rates	L	Short	✓			✓	✓	✓	✓	
Multi-Hazard #3	Develop early warning test program: partnering with NOAA, city police, fire department to coordinate test.	Emergency Management	TVF&R, Police, 911	General fund	L	Short	✓		✓	✓		✓	✓	
Multi-Hazard #4	Review ordinances and develop outreach programs to assure mobile homes and manufactured buildings are protected from natural hazards. (Anchoring, elevation, and other methods as applicable)	Community Development	Administration	General Fund, DLCD TA	L	Medium				✓	✓	✓	✓	
Multi-Hazard #5	Develop critical facility list needing emergency back-up power systems, prioritize, seek funding and implement mitigation actions.	Emergency Management	Community Development	General Fund, HMA	M	Short	✓		✓			✓	✓	
Multi-Hazard #6	Purchase and install generators with main power distribution disconnect switches for identified and	Emergency Management	Community Development	General Fund, HMA	M	Medium	✓		✓	✓		✓	✓	

Natural Hazard Action ID	Action Item	Coordinating Organization (Lead)	Partners	Potential Funding	Cost	Timing	Plan Goals Addressed							
							Goal 1	Goal 2	Goal 3	Goal 4	Goal 5	Goal 6	Goal 7	Goal 8
	prioritized critical facilities susceptible to short term power disruption. (i.e. first responder and medical facilities, schools, correctional facilities, and water and sewage pump stations, etc.)													
Multi-Hazard #7	Improve vegetation management throughout the city.	Community Development	Public Works	General fund, utilities	L	Ongoing		✓	✓	✓	✓	✓		✓
Multi-Hazard #8	Encourage utility companies to evaluate and harden vulnerable infrastructure elements for sustainability.	Emergency Management	Community Development, Public Works	General fund, utilities	L	Ongoing	✓		✓	✓		✓		✓

Drought Actions

No actions identified at this time

Earthquake Actions

Earthquake #1	Conduct seismic strength evaluations of critical facilities and infrastructure to identify vulnerabilities and seismically retrofit (structural and nonstructural) identified critical facilities and infrastructure to meet life safety standards in order to continue operations post-earthquake.	Emergency Management	Administration , Community Development, Public Works, TVF&R, Police	General funds, utility fees, grants (SRGP, HMA)	H	Long		✓	✓	✓		✓	✓	✓
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Natural Hazard Action ID	Action Item	Coordinating Organization (Lead)	Partners	Potential Funding	Cost	Timing	Plan Goals Addressed							
							Goal 1	Goal 2	Goal 3	Goal 4	Goal 5	Goal 6	Goal 7	Goal 8
Flood Actions														
Flood #1	Ensure continued compliance in the National Flood Insurance Program (NFIP) through enforcement of local floodplain management ordinances.	Community Development	Emergency Management; Public Works	General fund	L	Ongoing	✓	✓	✓	✓	✓	✓	✓	
Flood #2	Coordinate with Yamhill County, DOGAMI, and DLCD to enhance data and mapping of floodplain data in the county. Identify and map flood-prone areas outside of designated floodplains. <i>(Attempted in 2019, not funded)</i>	Emergency Management	Community Development	General fund, HMA, Risk MAP	M	Long	✓		✓	✓		✓	✓	
Flood #3	Perform hydrologic and hydraulic engineering, and drainage studies and analyses	Public Works	Community Development	General fund	M	Long	✓		✓	✓		✓	✓	
Flood #4	Develop and maintain GIS mapped critical facility inventory for all structures and residential and commercial buildings located within 100-year and 500-year floodplains.	Community Development	Public Works, Emergency Management	General fund	L	Short	✓		✓	✓		✓	✓	
Flood #5	Acquire, relocate, elevate, or otherwise flood-proof critical facilities.	Administration	Community Development, Public Works, Police, TVF&R	General fund, HMA	H	Long		✓	✓			✓	✓	
Flood #6	Secure a redundant water supply to supply one day of wintertime average water demand. Preferred locations are north of the Willamette River.	Public Works	Community Development, Administration	General fund, utility fees, grants	H	Long			✓	✓		✓	✓	

Natural Hazard Action ID	Action Item	Coordinating Organization (Lead)	Partners	Potential Funding	Cost	Timing	Plan Goals Addressed							
							Goal 1	Goal 2	Goal 3	Goal 4	Goal 5	Goal 6	Goal 7	Goal 8
Landslide Actions														
Landslide #1	Use DOGAMI landslide risk maps to improve public knowledge of landslide hazard areas and understanding of vulnerability and risk to life and property in hazard-prone areas in the city.	Emergency Management	DOGAMI	General fund	M	Short	✓	✓	✓			✓	✓	
Severe Weather Actions (Windstorm and Winter Storms – Snow/Ice)														
Severe Weather #1	Develop, implement, and maintain partnership program with electrical utilities to use underground utility placement methods where possible to reduce or eliminate power outages from severe winter storms. Consider developing incentive programs. Develop and implement tree clearing mitigation programs to keep trees from threatening lives, property, and public infrastructure from severe weather events.	Public Works	Community Development	General fund, utility fees, grants	H	Ongoing	✓	✓	✓			✓	✓	
Severe Weather #2	Review critical facilities and government building energy efficiency, winter readiness, and electrical protection capability. Identify, prioritize, and implement infrastructure upgrades (e.g., undergrounding, etc.)	Emergency Management	Public Works, Community Development, Administration	General fund, grants	H	Medium	✓		✓			✓	✓	

Natural Hazard Action ID	Action Item	Coordinating Organization (Lead)	Partners	Potential Funding	Cost	Timing	Plan Goals Addressed							
							Goal 1	Goal 2	Goal 3	Goal 4	Goal 5	Goal 6	Goal 7	Goal 8
Volcanic Event Actions														
Volcanic Event #1	Evaluate ash impact on stormwater drainage system and develop mitigation actions.	Public Works	Community Development	General fund	L	Long				✓	✓	✓		✓
Wildfire Actions														
Wildfire #1	Coordinate wildfire mitigation action items through the Yamhill County Community Wildfire Protection Plan.	TVF&R	Community Development	General fund	L	Ongoing	✓	✓	✓	✓	✓	✓	✓	✓
Wildfire #2	Promote fire-resistant strategies and the use of non-combustible roofing materials by evaluating and making recommendations to current code to encourage noncombustible roofing standards in high fire-hazard areas.	Fire & Planning	Community Development	General fund	L	Long		✓	✓	✓	✓	✓	✓	✓
Wildfire #3	Conduct regular fuel-reduction projects throughout wildfire hazard-prone areas in the city.	Fire Defense Board	ODF, BOC,	General fund, grants	M	Ongoing		✓	✓	✓	✓	✓	✓	✓

Source: City of Newberg steering committee, 2020.

Note: Full text of the plan goals referenced in this table is located on page NA-2.

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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, Section 2, and Volume III, Appendix C. The risk assessment process is graphically depicted in Figure NA-1. Ultimately, the goal of hazard mitigation is to reduce the area of risk, where hazards overlap vulnerable systems.

Figure NA-1 Understanding Risk



Hazard Analysis

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

Table NA-2 shows the HVA matrix for Newberg 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 sense of hazard priorities but does not predict the occurrence of a hazard.

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

Table NA-2 Hazard Analysis Matrix

Hazard	Maximum				Total Threat Score	Hazard Rank	Hazard Tiers
	History	Vulnerability	Threat	Probability			
Winter Storm	16	40	80	56	192	#1	Top Tier
Earthquake - Cascadia	6	45	100	35	186	#2	
Windstorm	16	25	70	56	167	#3	
Drought	8	15	50	56	129	#4	Middle Tier
Flood	8	15	50	49	122	#5	
Earthquake - Crustal	6	20	60	28	114	#6	
Wildfire	6	15	40	21	82	#7	Bottom Tier
Landslide	6	15	30	21	72	#8	
Volcanic Event	4	10	30	7	51	#9	

Source: Newberg steering committee, 2019-2020.

Table NA-3 categorizes the probability, and vulnerability scores from the hazard analysis for the City and compares the results to the assessment completed by the Yamhill County steering committee. Variations between the City, and County are noted in **bold** text within the city ratings.

Table NA-3 Probability and Vulnerability Comparison

Hazard	Newberg		Yamhill County	
	Probability	Vulnerability	Probability	Vulnerability
Drought	High	Low	High	Moderate
Earthquake - Cascadia	Moderate	High	Moderate	High
Earthquake - Crustal	Moderate	Moderate	Low	Moderate
Flood	Moderate	Low	High	High
Landslide	Low	Low	High	Low
Volcanic Event	Low	Low	Low	Low
Wildfire	Low	Low	Low	Low
Windstorm	High	Moderate	High	Moderate
Winter Storm	High	High	High	High

Source: Newberg and Yamhill County steering committee, 2019-2020.

Community Characteristics

Table NA-4 and the following section provides information on City specific demographics, and assets. 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. Between 2012 and 2019 the City grew by 1,745 people (8%).² According to the State's official coordinated population forecast, between 2019 and 2040 the City's population is forecast to grow by 53% to 36,709.³ *Note: the State is currently updating the official forecast and the proposed 2040 population is 32,780 which represents a 36% increase from 2019 population.*⁴ Median household income decreased by 3% between 2012 and 2017.⁵ New development has complied with the standards of the [Oregon Building Code](#), and the city's development code including their floodplain ordinance.

Economy

The City of Newberg is in the northeast corner of Yamhill County, on the north side of the Willamette River. Newberg's commercial areas developed along primary routes, and residential development followed nearby (see Figure NA-2).

Newberg is the second largest incorporated community in Yamhill County. There is significant economic activity happening within the City of Newberg, making it a desirable place to live, work, and visit. Most workers residing in the city (81%, 8,221 people) travel outside of the city for work primarily to the Portland metro area, Salem, and McMinnville.⁶ A significant population of people travel to the city for work, (77% of the workforce, 6,613 people) primarily from McMinnville, Portland metro area, Sherwood, Lafayette, and Salem.

Newberg residents are mostly employed in professional (18%), management, business, and financial operations (15%), office and administrative support (13%), sales (10%), production (9%), and food preparation and serving (8%) occupations.⁷

² Portland State University, Population Research Center, "Annual Population Estimates", 2019.

³ Portland State University, Population Research Center, "Oregon Population Forecast Program Cycle 1 (2014-2017)". 2017.

⁴ Portland State University, Population Research Center, "Oregon Population Forecast Program Cycle 2 (2018-2020)". 2020 (proposed).

⁵ Social Explorer, Table T57, U.S. Census Bureau, 2013-2017 and 2008-2012 American Community Survey Estimates.

⁶ U.S. Census Bureau. LEHD Origin-Destination Employment Statistics (2002-2017). Longitudinal-Employer Household Dynamics Program, accessed on April 25, 2020 at <https://onthemap.ces.census.gov>.

⁷ Social Explorer, Table A17008, U.S. Census Bureau, 2013-2017 American Community Survey Estimates.

Table NA-4 Community Characteristics

Population Characteristics		
2012 Population	22,300	
2019 Population	24,045	
2040 Forecasted Pop. [Proposed]*	36,709	[32,780]
Race (non-hispanic) and Ethnicity (Hispanic)		
White	80%	
Black/ African American	< 1%	
American Indian and Alaska Native	1%	
Asian	2%	
Native Hawaiian and Other Pacific Islander	< 1%	
Some Other Race	0%	
Two or More Races	3%	
Hispanic or Latino	15%	
Limited or No English Spoken	5%	
Vulnerable Age Groups		
Less than 15 Years	4,042	18%
65 Years and Over	3,181	14%
Disability Status		
Total Population	3,112	14%
Children	261	5%
Seniors	1,479	47%
Income Characteristics		
Households by Income Category		
Less than \$15,000	841	10%
\$15,000-\$29,999	1,047	13%
\$30,000-\$44,999	1,390	17%
\$45,000-\$59,999	907	11%
\$60,000-\$74,999	895	11%
\$75,000-\$99,999	1,417	17%
\$100,000-\$199,999	1,488	18%
\$200,000 or more	141	2%
Median Household Income	\$56,910	
Poverty Rates		
Total Population	3,652	17%
Children	1,276	26%
Seniors	156	5%
Housing Cost Burden		
Owners with Mortgage	1,464	29%
Renters	1,716	55%

Source: U.S. Census Bureau, 2013-2017 American Community Survey; Portland State University, Population Research Center, "Annual Population Estimates", 2019. Portland State University, Population Research Center, "Oregon Population Forecast Program Cycle 1 (2014-2017)". 2017. and "Oregon Population Forecast Program Cycle 2 (2018-2020)". 2020 (proposed).

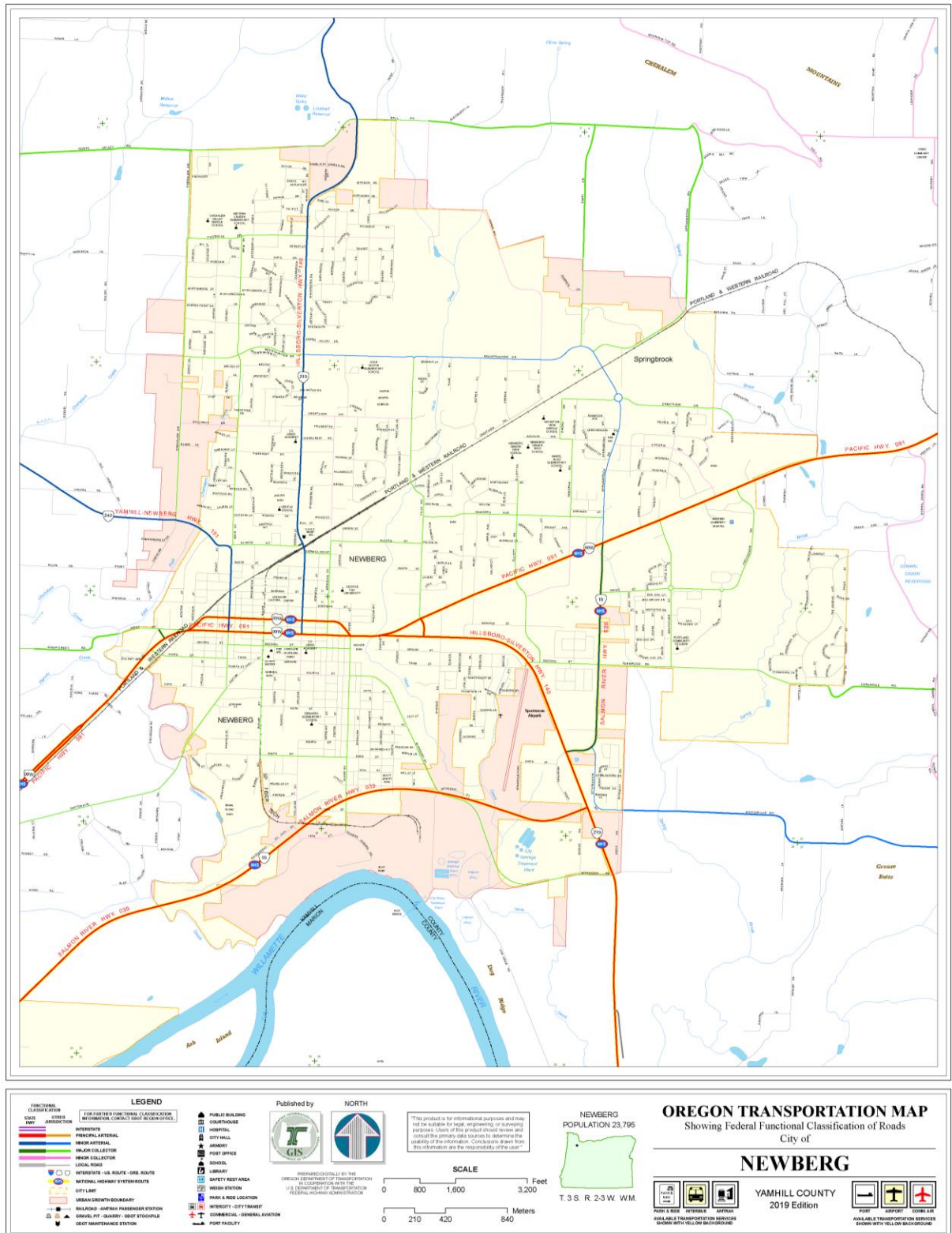
Housing Characteristics		
Housing Units		
Single-Family	6,027	70%
Multi-Family	1,943	23%
Mobile Homes	610	7%
Year Structure Built		
Pre-1970	2,475	29%
1970-1989	2,710	32%
1990-2009	2,995	35%
2010 or later	400	5%
Housing Tenure and Vacancy		
Owner-occupied	5,023	59%
Renter-occupied	5,314	31%
Seasonal	0	0%
Vacant	454	5%

Newberg is in the northeastern corner of Yamhill County, located in the Tualatin Valley. The Willamette River is to the south of the city and there are three drainage basins within the city: Chehalem Creek, Hess Creek, and Spring Brook. Newberg is generally flat and has gently rolling hills to the north and northeast of the city. Soils in Newberg area largely silt loams of the Aloha (poorly drained) and Woodburn (moderately well-drained) series. The area that is not urbanized is cultivated or comprised of grass, scattered Oak, and Douglas Fir.

Newberg's temperatures range from a monthly average low of 34-39°F in the winter months to average highs of 76-82°F in the summer months. The coolest month is December and the warmest month is August. The average annual precipitation is about 43 inches and approximately 75% falls between November and April.

The City has an educated population with 88% of residents 25 years, and older holding a high school degree, 28% have a bachelor's degree or higher. The Newberg School District has an 85% graduation rate as of 2019. Newberg includes industrial and commercial development but is zoned primarily residential.

Figure NA-2 Oregon Transportation Map: City of Newberg



Source: Oregon Department of Transportation

Community Assets

This section outlines the resources, facilities, and infrastructure that, if damaged, could significantly impact the public safety, economic conditions, and environmental integrity of Newberg.

Critical facilities and infrastructure are those that support government and first responders' ability to act in an emergency. They are a top priority in any comprehensive hazard mitigation plan. These include locally designated shelters and other essential assets, such as fire stations, and water and wastewater treatment facilities (see Table NA-5). **Essential facilities and infrastructure** are those that support the continued delivery of key government services, and/or that may significantly impact the public's ability to recover from the emergency. These facilities may include: City buildings and other public facilities such as schools.

It is important to note that the facilities identified as "critical" and "essential" are characterized differently than the structural code that identifies buildings as "essential" and "non-essential." The structural code uses different language and criteria and therefore have completely different meanings than the buildings identified in this addendum.

Table NA-5 Critical and Essential Facilities

Facility Name	Address	
Government		
<i>See Table NA-6 for information on seismic vulnerability.</i>		
City Hall	414 E. 1st St.	Critical
Annex	115 S. Howard St.	Critical
Public Safety Building/Police	401 E. Third St.	Critical
Public Works Maintenance	500 W 3 rd St	Essential
US Post Office	401 E. First St.	Essential
US Army National Guard	620 N Morton St	Critical
Waste Management	2808 Wyooski Rd	Essential
Treatment Plants Admin offices	2301 NE Wyooski Rd	Essential
Water Treatment Plant Office	1400 Wyooski St	Essential
Emergency Response		
Fire Station #20 (TVF&R)	414 E. 2nd St.	Critical
Fire Station #21 (TVF&R)	3100 Middlebrook Dr.	Critical
Educational (Public)		
Newberg SD 29J (Admin Office)	714 E 6th St	Essential
School District Shops	703 S. Blaine St.	Essential
Antonia Crater Elementary	203 W Foothills Dr	Essential
Edwards Elementary	715 E 8th St	Essential
Ewing Young Elementary	17600 NE N Valley Rd	Essential
Joan Austin Elementary	2200 N Center St	Essential
Mabel Rush Elementary	1441 Deborah Rd	Essential

Chehalem Valley Middle School	403 W Foothills Dr	Essential
Mountain View Middle School	2015 Emery Dr	Essential
Newberg High School	2400 Douglas Rd	Essential
Educational (Private/Charter/Montessori, etc.)		
CS Lewis Academy	609 Wynooski St	Essential
Veritas Academy	401 Mission Dr	Essential
Benedict Preschool	504 E. 2nd St.	Essential
Jack and Jill Christian Preschool	3231 Antonia Way	Essential
Colleges/Universities		
Portland Community College	135 Werth Blvd	Essential
George Fox University	414 Meridian	Essential
Medical Care Facilities		
Providence Newberg Medical Center	1003 Providence Drive	Critical
	310 Villa Rd	Critical
	218 Villa Rd	Critical
	1515 E. Portland Rd	Critical
Newberg Urgent Care	2880 Hayes St	Critical
Community Facilities		
Northwest Senior & Disability Services	101 West Foothills	Essential
Yamhill Community Action Partnership	719 E First St	Essential

Transportation/Infrastructure

Mobility plays an important role in Newberg, and the daily experience of its residents, and businesses. Motor vehicles represent the dominant mode of travel through, and within Newberg. Newberg is served by Yamhill County Transit, Oregon POINT, among other transit providers.

Infrastructure that provides critical and essential services include:

Railroads

Railroads are major providers of regional and national cargo and trade flows. Railroads run through the Northern Willamette region provide vital transportation links from the Pacific to the rest of the country. The Portland & Western (PNWR) provides freight service to/from the city. There is no passenger rail service in the city.

Rails are sensitive to icing from the winter storms that can occur in the Northern Willamette region. For industries in the region that utilize rail transport, these disruptions in service can result in economic losses. The potential for rail accidents caused by natural hazards can also have serious implications for the local communities if hazardous materials are involved.

Airports

The city has no commercial service airports, however Portland International Airport (PDX), the largest and busiest airport in the state, is in nearby Multnomah County. There is one public airport: Sportsman Airpark (includes Western Helicopter).

Roads/Seismic lifelines

Oregon 99W is the major transportation east-west route through the city. OR 219, OR 240, and OR 18/Newberg-Dundee Bypass, Sunnycrest Rd, and Dayton Ave are also major transit routes (see Figure NA-2).

Seismic lifeline routes help maintain transportation facilities for public safety and resilience in the case of natural disasters. Following a major earthquake, it is important for response and recovery agencies to know which roadways are most prepared for a major seismic event. The Oregon Department of Transportation has identified lifeline routes to provide a secure lifeline network of streets, highways, and bridges to facilitate emergency services response after a disaster.⁸

System connectivity and key geographical features were used to identify a three-tiered seismic lifeline system. Routes identified as Tier 1 are considered the most significant and necessary to ensure a functioning statewide transportation network. The Tier 2 system provides additional connectivity to the Tier 1 system, it allows for direct access to more locations and increased traffic volume capacity. The Tier 3 lifeline routes provide additional connectivity to the systems provided by Tiers 1 and 2.

The Lifeline Routes in Newberg:

- Tier I: 99W
- Tier II: None
- Tier III: Hwy 219

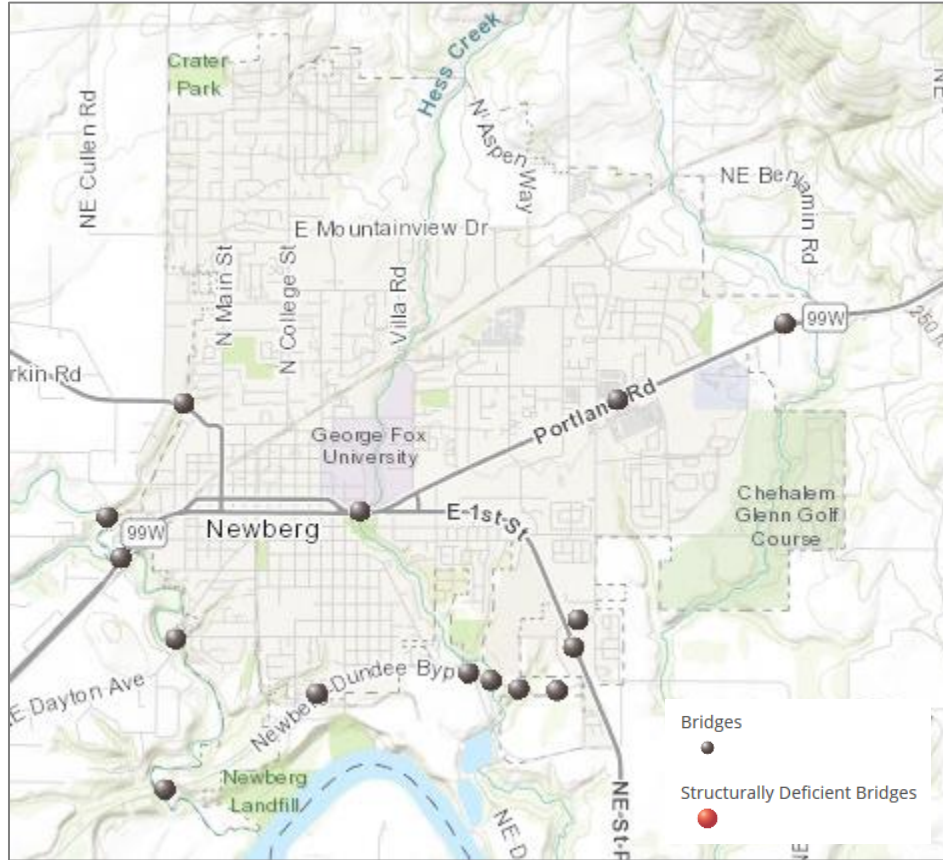
Bridges

Because of earthquake risk, the seismic vulnerability of the county's bridges is an important issue. Non-functional bridges can disrupt emergency operations, sever lifelines, and disrupt local and freight traffic. These disruptions may exacerbate local economic losses if industries are unable to transport goods. Bridges within the city that are critical or essential include:

- Chehalem St/OR 99W bridge (ODOT 02054A)
- Chehalem St/OR 240 bridge (ODOT 17451)
- Chehalem St/Dayton Ave bridge (ODOT 11767F)
- Chehalem St/Sunnycrest bridge
- St Paul OR 219 bridge (ODOT 22406)
- Hess Creek/Hwy 1W (OR 99W) (ODOT 00458)

⁸ Oregon Department of Transportation. Oregon Seismic Lifeline Evaluation Vulnerability Synthese Identification, *Oregon Seismic Lifeline Routes*, May 15 2012. Page 6-4 figure 6-1. Accessed September 12, 2019.

Figure NA-3 Oregon Bridges and Structurally Deficient Bridges



Source: Oregon Department of Transportation, ODOT TransGIS, accessed May 21, 2020

Utility Lifelines

Utility lifelines are the resources that the public relies on daily such as, electricity, fuel and communication lines. If these lines fail or are disrupted, the essential functions of the community can become severely impaired. Utility lifelines are closely related to physical infrastructures, like dams and power plants, as they transmit the power generated from these facilities.

Generally, the network of electricity transmission lines running throughout the city is operated by Portland General Electric.⁹ The Williams Gas Pipeline provides natural gas that is delivered to customers in the city by Northwest Natural Gas. These lines may be vulnerable as infrequent natural hazards, like earthquakes, could disrupt service to natural gas consumers across the region.

The city water and wastewater systems include the following:

- Water Reservoirs:
 - North Valley No. 1 and No. 2
 - Corral Creek (31451 NE Corral Creek Rd)
- Pump station (W 8th Street/Ivy Lane)

⁹ Allan, Stuart et. al., Atlas of Oregon. Pg. 102.

- Sewer treatment plant (2301 Wynooski Rd)
- Water treatment plant (2200 Wynooski Rd)

Environmental Assets/Parks:

Environmental assets are those parks (most parks in the area are maintained by the Chehalem Parks and Recreation District, CPRD) , green spaces, wetlands, and rivers that provide an aesthetic, and functional ecosystem services for the community include:

- | | |
|------------------------------------|-------------------------------------|
| Armory Park | Jaquith Park |
| Babe Nicklous Pool Park | Memorial Park |
| Bald Peak State Park (9 miles NW)) | Oak Knoll Tot Lot |
| Bob’s Corner Park | Riley Park & Farmhouse |
| Buckley Park | Rogers Landing County Park (County) |
| College Park | Rotary Centennial Park |
| Champoeq Park (6 miles SE) | Schaad Park |
| Crater Park | Scott Levitt Park |
| Ewing Young Park/Newberg Dog Park | Spring Meadow Park |
| Francis Square | Tom Gail Park |
| Gladys Park | White Oak Park |
| Hoover Park/Hess Creek | |

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:

Child Care Facilities

- | | |
|---|---------------------------------------|
| Bundles of Joy Day Care | Newberg YMCA Child Development Center |
| Buckle My Shoe Childcare | Open Bible Learning Center |
| Great Expectations Daycare Center | Parkview Daycare |
| Hand in Hand Children’s Learning Center | |
| Let the Blessing Flow Childcare | |

Adult Care Facilities

- | | |
|---|--|
| Arbor Oaks Terrace | Friendsview Village |
| Astor House | Huffman House |
| Avamere at Newberg | Newberg Care Home |
| Chehalem Health & Rehab Center | Northwest Senior & Disability Services |
| Chehalem Valley Senior Citizen Council) | Marquis Care Home |
| Friendsview Retirement Community | Senior Center |
| | Willow Place |

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 Newberg 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. The following historic resources can be found in the City of Newberg:

Scout House
Library Annex

Newberg Public Library
George Fox University

Hazard Characteristics

Drought

The steering committee determined that the City's probability for drought is **high**, and that their vulnerability to drought is **low**.

Volume I, Section 2 describes the characteristics of drought hazards, history, as well as the location, extent, and probability of a potential event. Due to the climate of Yamhill County, past, and present weather conditions have shown an increasing potential for drought.

The City of Newberg owns and operates a "wellfield" south of the Willamette River that supports 100% of the water supply for the City.¹⁰ The City also operates Otis Spring, used for irrigation purposes only. In addition to supplying water to residents within the city limits the city also supplies water to some residents outside of the city including residents of Aspen Estates (along Highway 240 west of Chehalem Creek), properties along Highway 99W east of Providence Hospital including the Rex Hill Winery, and a number of private water districts. The existing well capacity allows for a minimum of 8.9 million gallons per day (mgd) to a maximum of 11.8 mgd via two water transmission mains (one 24-inch diameter main is suspended from a city owned decommissioned bridge and another 30-inch diameter main downstream from the bridge carries from the well field under the Willamette River) from the wellfield to the water treatment plant(WTP). Operational capacity at the WTP is limited to approximately 8 mgd due to undersized piping between the water mains and settling basins at the WTP.

The city has three reservoirs with a combined capacity of about 12 million gallons (MG). North Valley Reservoirs No. 1 (4 MG) and No. 2 (4 MG) are located outside of the UGB on the north side of North Valley Road west of Highway 219. The reservoirs were constructed in 1960 (No. 1) and 1978 (No. 2, seismically retrofitted in 2017). The Corral Creek Reservoir (4 MG) was constructed in 2003 and is located on the eastside of the city's water system.

For more information on Newberg's water supply visit their website:

<https://www.newbergoregon.gov/operations/page/our-water-source>.

Vulnerability Assessment

Due to insufficient data and resources, Newberg is currently unable to perform a quantitative risk assessment, or exposure analysis, for this hazard. State-wide 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 apply to humans and resources. Industries important to the City of Newberg's local economy such as

¹⁰ Our Water Source. City of Newberg. Last visited 8/15/19.
<https://www.newbergoregon.gov/operations/page/our-water-source>

agriculture, fishing, and timber have historically been affected, and any future droughts would have tangible economic and potentially human impacts.

The city's existing well field is its only water source and is vulnerable to flooding during the winter wet season. The city's water mains are vulnerable to seismic activity.

Mitigation Activities

The City provides information on water conservation including free water efficiency kits to Newberg water customers and free water assessments for low-income customers. The City engages in other water conservation measures including water line leak detection and repair, replacement of deteriorating pipe, and replacement/repair of older and under-registering water meters and reducing dead end lines in order to increase water circulation throughout the system.

Newberg Codes Pertaining to Droughts

The following Newberg codes, plans, and policies pertain to droughts:

1. Newberg Comprehensive Plan, Goal 7 - Areas Subject to Natural Disasters and Hazards, goal is: "To protect life and property from flooding and other natural hazards."
2. Newberg Municipal Code chapter 13.15 Water, Article III, Water Emergencies, provides the city's water conservation and curtailment policies.

Please review Volume I, Section 2 for additional information on this hazard.

Earthquake (Cascadia Subduction Zone)

The steering committee determined that the City's probability for a Cascadia Subduction Zone (CSZ) earthquake is **moderate** and that their vulnerability to a CSZ earthquake is **high**.

Volume I, Section 2 describes the characteristics of earthquake hazards, history, as well as the location, extent, and probability of a potential event. Generally, an event that affects the County is likely to affect Newberg as well. The causes, and characteristics of an earthquake event are appropriately described within the 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 Newberg as well.

Within the Northern Willamette Valley are that includes Yamhill County, two potential faults and/or zones can generate high-magnitude earthquakes. These include the Cascadia Subduction Zone and the Gales Creek-Newberg-Mt. Angel Structural Zone (including the Newberg Fault).

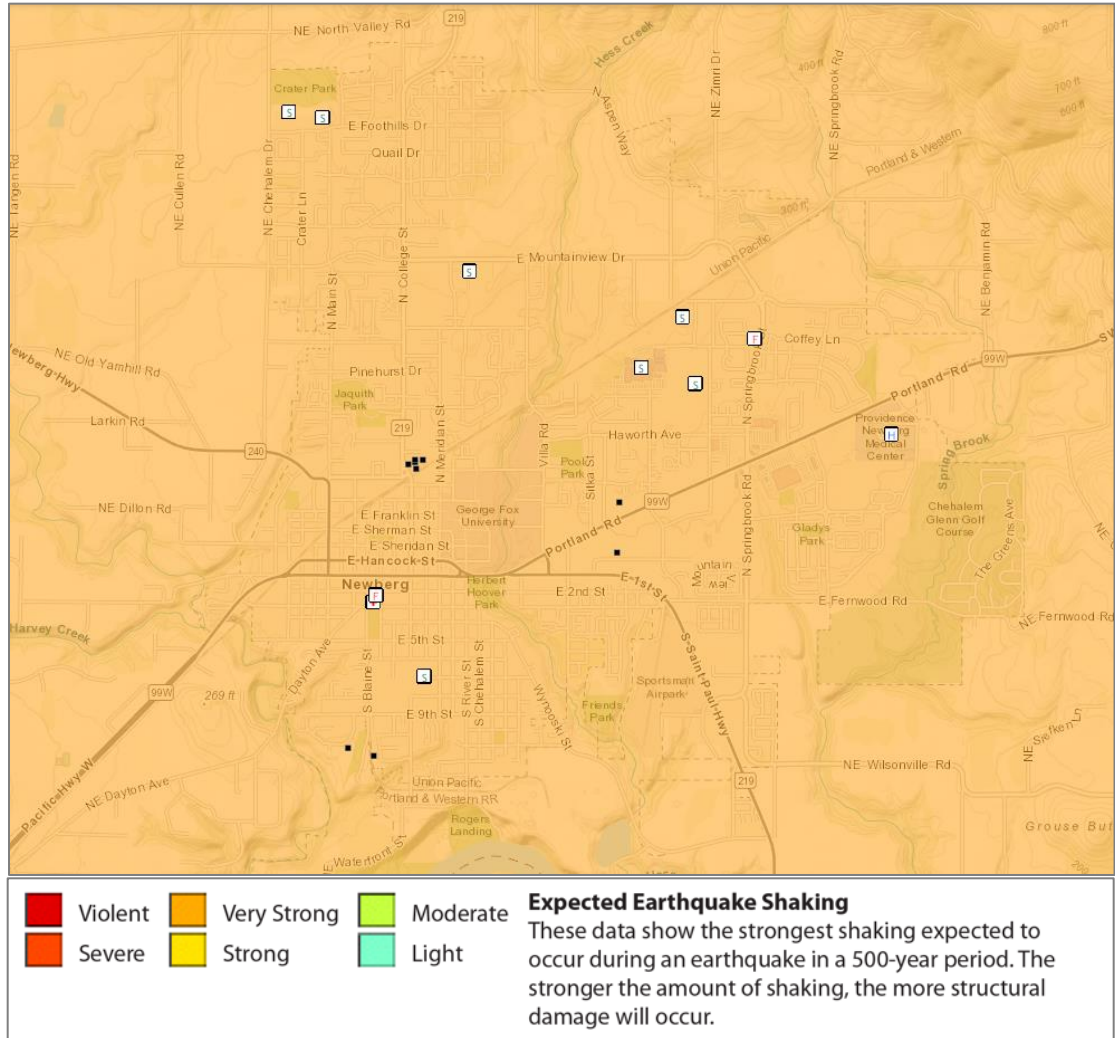
Cascadia Subduction Zone

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 approximately 1700 A.D.¹¹

Figure NA-4 displays relative shaking hazards from a Cascadia Subduction Zone earthquake event. As shown in the figure, most of the City is expected to experience very strong (orange) shaking in a CSZ event.

Figure NA-4 Cascadia Subduction Zone Expected Shaking



Source: [Oregon HazVu: Statewide Geohazards Viewer \(DOGAMI\)](#)

Note: To view detail click the link above to access Oregon HazVu.

The city'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 City 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 Newberg within the "Valley Zone" (Valley Zone, from the summit of the Coast Range to the summit of the

¹¹ The Cascadia Region Earthquake Workgroup, 2005. Cascadia Subduction Zone Earthquakes: A magnitude 9.0 earthquake scenario. <http://www.crew.org/PDFs/CREWSubductionZoneSmall.pdf>

Cascades). Within the Northwest Oregon region, 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.

Earthquake (Crustal)

The steering committee determined that the City's probability for a crustal earthquake is **moderate** and that their vulnerability to crustal earthquake is **moderate**.

Volume I, Section 2 describes the characteristics of earthquake hazards, history (see below), as well as the location, extent, and probability of a potential event. Generally, an event that affects the County is likely to affect Newberg 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 Newberg as well.

A 4.0 magnitude earthquake struck Molalla (28 miles southeast of Newberg) on December 13, 2017. While the earthquake was felt by residents in Newberg there was not widespread damage, except for a city waterline break (at 9th St and College St).

Figure NA-5 shows a generalized geologic map of the Newberg area that includes the areas for potential regional active faults, earthquake history (1971-2008), and soft soils (liquefaction) hazard. The figure shows the areas of greatest concern within the City limits as red and orange and shows the Newberg Fault.

Vulnerability Assessment (subduction zone and crustal)

Due to insufficient data and resources, Newberg is currently unable to perform a quantitative risk assessment for this hazard.

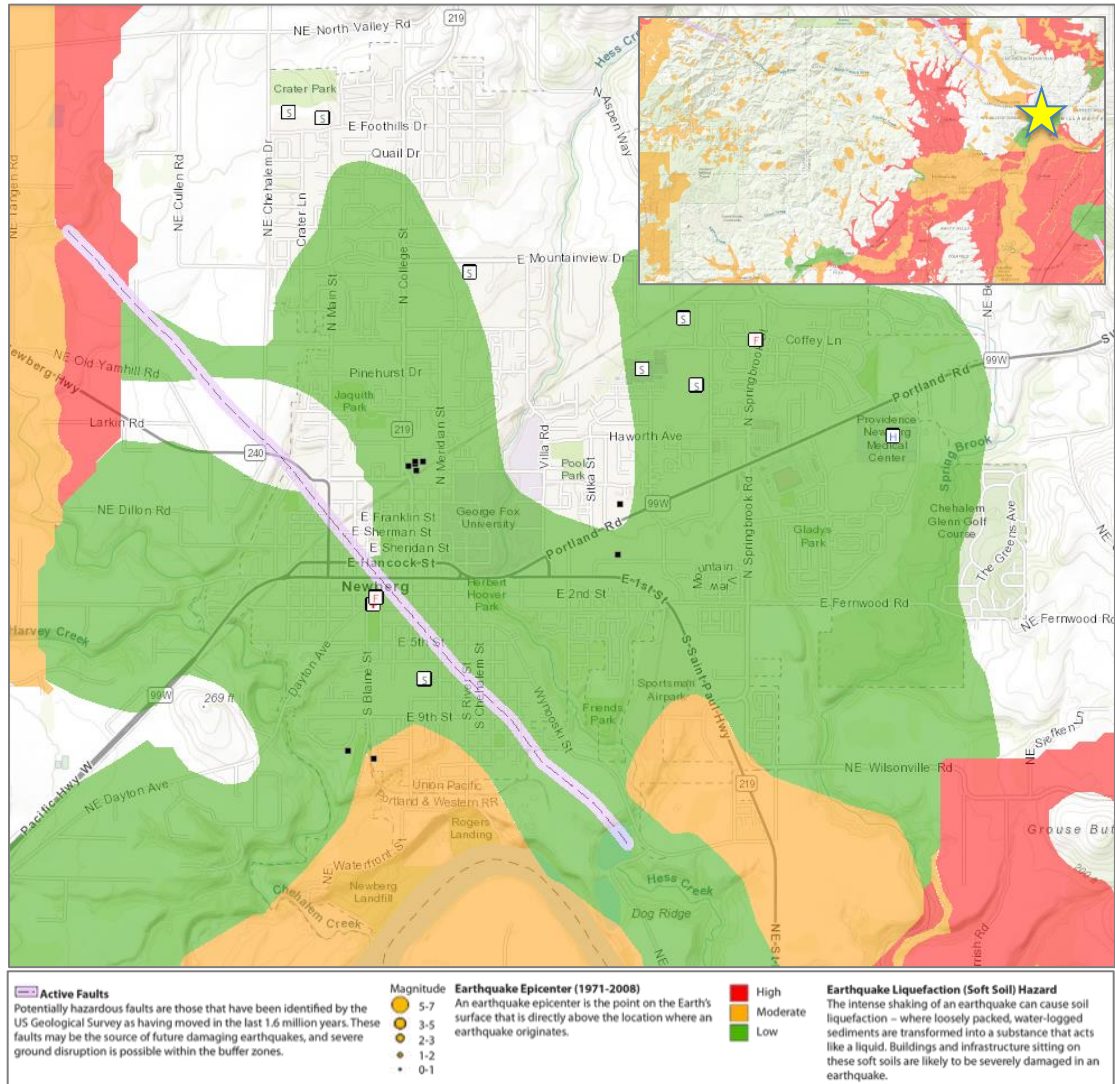
The western portion of Yamhill County is likely to experience higher levels of shaking than the eastern portion, as a result of its proximity to the Cascadia Subduction Zone.

The City of Newberg is in the eastern portion of Yamhill County, in a region likely to experience strong shaking should a subduction zone or significant crustal earthquake occur. This rating represents the peak acceleration of the ground caused by the earthquake, and for a strong designation corresponds to 9-20 percent of the acceleration of gravity.

Ground movement in both areas, however, is likely to cause damage to weak, unreinforced masonry buildings, and to induce small landslides along unstable slopes. As well as landslide, earthquakes can trigger other hazards such as dam failure and disruption of transportation and utility systems.

Utility systems will be significantly damaged, including damaged buildings, and damage to utility infrastructure, including water 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. 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.

Figure NA-5 Active Crustal Faults, Epicenters (1971-2008), and Soft Soils



Source: [Oregon HazVu: Statewide Geohazards Viewer \(DOGAMI\)](http://OregonHazVu.StatewideGeohazardsViewer(DOGAMI))

Note: To view detail click the link above to access Oregon HazVu.

Building codes were implemented in Oregon in the 1970s, however, stricter standards did not take effect until 1991 and early 2000s. As noted in the community characteristics section (

Table NA-4), approximately 60% of residential buildings were built prior to 1990, which increases the City’s vulnerability to the earthquake hazard. Information on specific public buildings’ (schools and public safety) estimated seismic resistance, determined by DOGAMI in 2007, is shown in Table NA-6; each “X” represents one building within that ranking category. Of the facilities evaluated by DOGAMI using their Rapid Visual Survey (RVS), none have a very high (100% chance) collapse potential, however, three (3) schools have a high (greater than 10% chance) collapse potential.

Table NA-6 Rapid Visual Survey Scores

Facility	Site ID*	Level of Collapse Potential			
		Low (<1%)	Moderate (>1%)	High (>10%)	Very High (100%)
Schools					
Antonia Crater Elementary (203 W Foothills Dr)	Yamh_sch21	X			
Edwards Elementary (715 E 8 th)	Yamh_sch25			X	
Ewing Young Elementary (17600 NE North Valley Rd)	Yamh_sch34	X			
Joan Austin Elementary (2200 N Center St)	Yamh_sch33	X			
Mabel Rush Elementary (1441 Deborah Rd)	Yamh_sch05			X	
Chehalem Valley Middle (403 W Foothills Dr)	Yamh_sch22	X			
Mountain View Middle (2015 N Emery Dr)	Yamh_sch06			X	
Newberg Senior High (2400 Douglas Rd)	Yamh_sch27		X		
Public Safety					
Newberg FD Station 20 (414 E 2 nd St)	Yamh_fir02		X		
Newberg FD Station 201 (3100 Middlebrook Dr)	Yamh_fir11	X			
Public Safety Building (EOC) (401 E 3rd St)	Yamh_pol01	X	SRGP 2017-19 Phase I: \$815,687		
Hospital					
Providence Hospital (1001 Providence Dr)	Yamh_hos02	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 Yamhill County Map](#)

Mitigation Activities

Earthquake mitigation activities listed here include current mitigation programs and activities that are being implemented by Newberg agencies or organizations.

A primary mitigation objective is to construct or upgrade critical and essential facilities and infrastructure to withstand future earthquake events. Seismic retrofit grant awards per the

[Seismic Rehabilitation Grant Program](#)¹² have been funded to retrofit the Public Safety Building (2017-19, Phase I, grant award, \$815,687). North Valley Water Reservoir No. 2 was retrofitted in 2017.

The City of Newberg website refers to the Yamhill County [Community Emergency Response Team](#) (CERT) program that trains members in mitigation as well as preparedness and response. The City's Emergency Management Program works with community groups, businesses, residential facilities, and public and private schools in promoting earthquake preparedness and mitigation.

Newberg Codes Pertaining to Earthquakes

The following Newberg codes, plans, and policies pertain to earthquakes:

1. Newberg Comprehensive Plan, Goal 7 - Areas Subject to Natural Disasters and Hazards, goal is: "To protect life and property from flooding and other natural hazards."
2. The City of Newberg Building Code (Municipal Code Chapter 14) regulates building material requirements and includes provisions for earthquakes.

Please review Volume I, Section 2 for additional information on this hazard.

Flood

The steering committee determined that the City's probability for flood is **moderate** and that their vulnerability to flood is **low**.

Volume I, Section 2 describes the characteristics of flood hazards, history, as well as the location, extent, and probability of a potential event. Portions of Newberg have areas of floodplains (special flood hazard areas, SFHA). These include areas include along Willamette River, Chehalem Creek, Hess Creek, and Spring Brook (Figure NA-6).

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 Newberg 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.

The Willamette River is just south of city limits and does not overflow into the city, however, it does contribute to other streams to back up and flood in the city (including the Chehalem and Hess creeks). Chehalem Creek rises rapidly after intense rainfall.

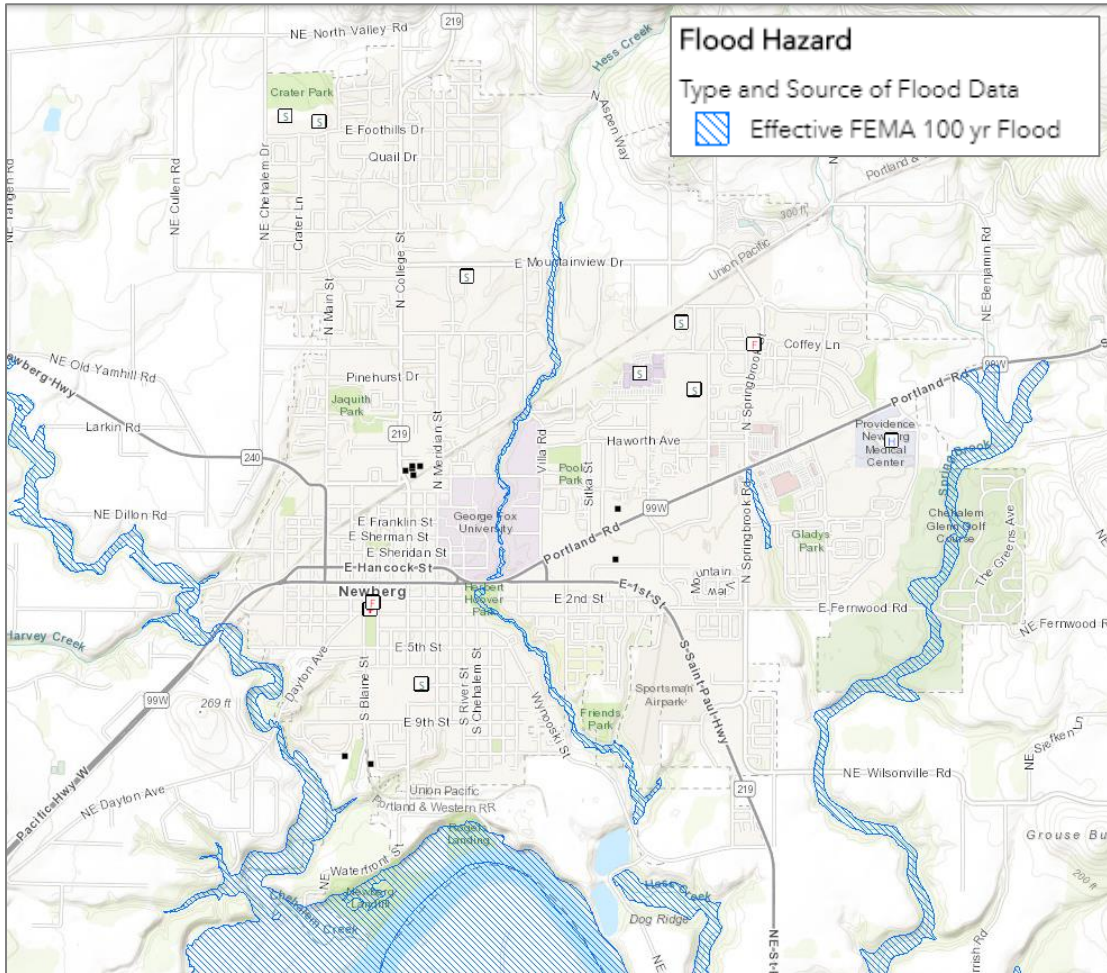
Floods can have a devastating impact on almost every aspect of the community, including private property damage, public infrastructure damage, and economic loss from business interruption. It is important for the City to be aware of flooding impacts and assess its level of risk. The City has been proactive 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. Business owners, and their employees are significantly

¹² 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.

impacted by flood events. Direct damages from flooding are the most common impacts, but indirect damages, such as diminished clientele, can be just as debilitating to a business.

Figure NA-6 Special Flood Hazard Area



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

Vulnerability Assessment

Due to insufficient data and resources, Newberg is currently unable to perform a quantitative risk assessment for this hazard. FEMA FIRMs were used to outline the 100-year and 500-year floodplains for the City of Newberg. The 100-year floodplain delineates an area of high risk, while the 500-year floodplain delineates an area of moderate risk. Commercial, industrial, and residential development is largely on higher ground outside of the special flood hazard area (SFHA). However, localized flooding can occur due to various factors including blocked stream channels or storm drains.

National Flood Insurance Program (NFIP)

FEMA's Flood Insurance Study (FIS), and Flood Insurance Rate Maps (FIRMs) are effective as of March 2, 2010. Table NA-7 shows that as of August 2019, Newberg has seven (7) National Flood Insurance Program (NFIP) policies in force. Of those, one (1) is for a property that was constructed before the initial FIRMs. The last Community Assistance Visit (CAV) for Newberg

was on March 28th, 1991. Newberg does not participate in the Community Rating System (CRS). The table shows that all flood insurance policies are for residential structures, all single-family homes. There have been no paid flood insurance claims. The City complies with the NFIP through enforcement of their flood damage prevention ordinance and their floodplain management program.

The Community Repetitive Loss record for Newberg identifies no Repetitive Loss Properties¹³ or Severe Repetitive Loss Properties¹⁴.

Table NA-7 Flood Insurance Detail

	Yamhill County	Newberg
Effective FIRM and FIS	3/2/2010	3/2/2010
Initial FIRM Date	-	3/1/1982
Total Policies	446	7
Pre-FIRM Policies	153	1
Policies by Building Type		
Single Family	401	7
2 to 4 Family	14	0
Other Residential	10	0
Non-Residential	21	0
Minus Rated A Zone	72	0
Insurance in Force	\$100,617,300	\$2,310,000
Total Paid Claims	81	0
Pre-FIRM Claims Paid	68	0
Substantial Damage Claims	3	0
Total Paid Amount	\$1,166,076	\$0
Repetitive Loss Structures	4	0
Severe Repetitive Loss Properties	1	0
CRS Class Rating	-	NP
Last Community Assistance Visit	-	3/28/1991

Source: Department of Land Conservation and Development, August 2019. Repetitive Flood Loss information provided by FEMA correspondence on September 10, 2020. NP = Not Participating

Mitigation Activities

Flood mitigation activities listed here include current mitigation programs and activities that are being implemented by Newberg agencies or organizations.

¹³ 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.

¹⁴ 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.

Newberg Codes Pertaining to Flooding

The following Newberg codes, plans, and policies pertain to flooding:

1. Newberg Comprehensive Plan, Goal 7 - Areas Subject to Natural Disasters and Hazards, goal is: "To protect life and property from flooding and other natural hazards."
2. Newberg Municipal Code chapter 15.343 *Areas of Special Flood Hazard Overlay*. This portion of the Community Development Code implements the Goal 7 policies of the Comprehensive Plan and regulates development within the floodplain.

Please review Volume I, Section 2 for additional information on this hazard.

Landslide

The steering committee determined that the City's probability for landslide is **low** and that their vulnerability to landslide is **low**.

Volume I, Section 2 describes the characteristics of landslide hazards, history, as well as the location, extent, and probability of a potential event within the region.

Landslide susceptibility exposure for Newberg is shown in Figure NA-7. Approximately 5% of Newberg has very high or high, and approximately 20% moderate, landslide susceptibility exposure.¹⁵ In general, the areas of greater risk are located outside of the city to the north and northeast. *Note that even if a jurisdiction has a high percentage of area in a high or very high landslide exposure susceptibility zone, this does not mean there is a high risk, because risk is the intersection of hazard, and assets.*

Potential landslide-related impacts are adequately described within Volume I, Section 2, and include infrastructure 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 occur during any winter, and thoroughfares beyond City limits are susceptible to obstruction as well.

The most common type of landslides 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.

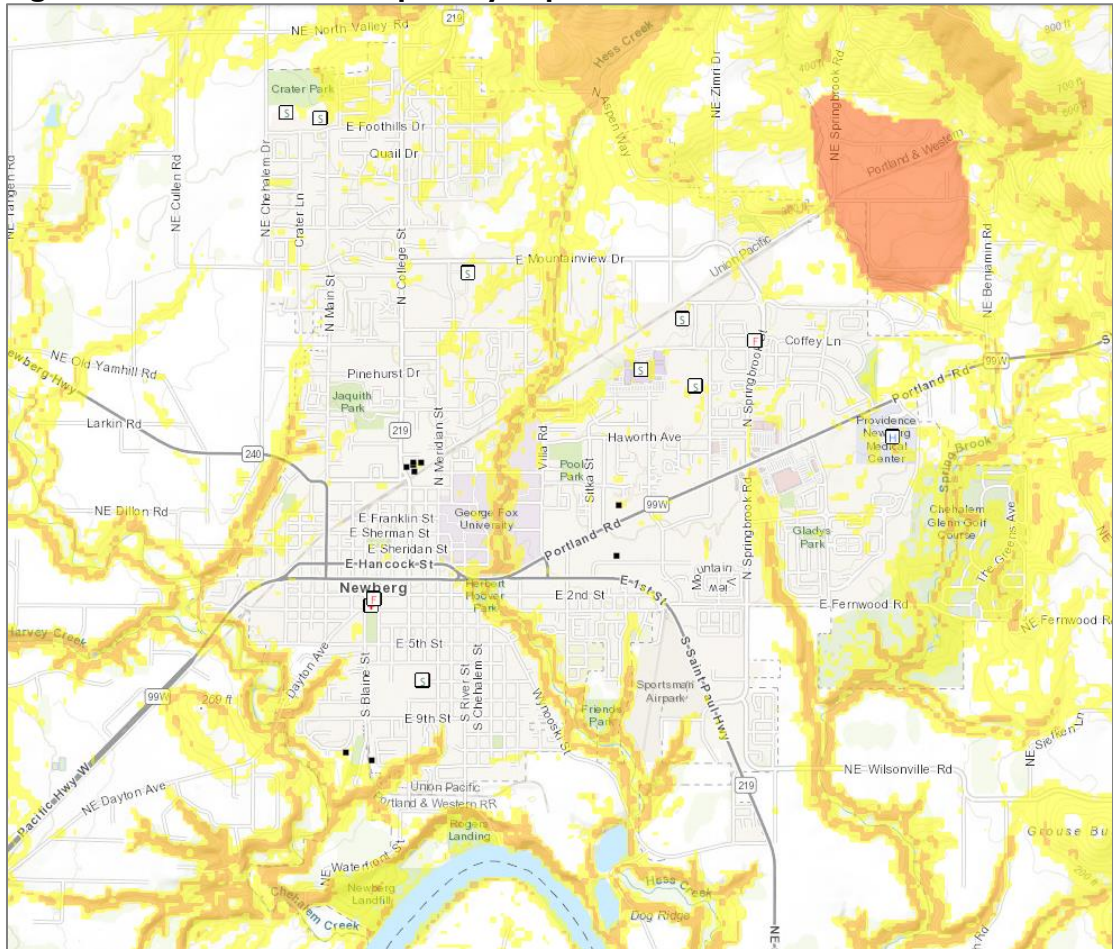
Vulnerability Assessment

Due to insufficient data and resources, Newberg is currently unable to perform a quantitative risk assessment for this hazard. DOGAMI completed a statewide landslide susceptibility assessment in 2016 ([O-16-02](#)), general findings from that report are provided above and within Figure NA-7. Response and recovery efforts will likely vary from minor cleanup to more extensive utility system rebuilding. Utility disruptions are usually local and terrain dependent. Damages may require reestablishing electrical, communication, and gas pipeline connections occurring from specific breakage points. Initial debris clearing from emergency routes and high traffic areas may be required. Water and wastewater utilities

¹⁵ DOGAMI. [Open-File Report, O-16-02](#), *Landslide Susceptibility Overview Map of Oregon* (2016)

may need treatment to quickly improve water quality by reducing excessive water turbidity and reestablishing waste disposal capability.

Figure NA-7 Landslide Susceptibility Exposure



Low	Landsliding unlikely. Areas classified as Landslide Density = Low (less than 7%) and areas classified as Slopes Prone to Landsliding = Low.
Moderate	Landsliding possible. Areas classified as Landslide Density = Low to Moderate (less than 17%) and areas classified as Slopes Prone to Landsliding = Moderate OR areas classified as Landslide Density = Moderate (7%-17%) and areas classified as Slopes Prone to Landsliding = Low.
High	Landsliding likely. Areas classified as Landslide Density = High (greater than 17%) and areas classified as Slopes Prone to Landsliding = Low and Moderate OR areas classified as Landslide Density = Low and Moderate (less than 17%) and areas classified as Slopes Prone to Landsliding = High.
Very High	Existing landslides Landslide Density and Slopes Prone to Landsliding data were not considered in this category. Note: the quality of landslide inventory (existing landslides) mapping varies across the state.

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

Mitigation Activities

Landslide mitigation activities listed here include current mitigation programs and activities that are being implemented by the City of Newberg agencies or organizations.

City of Newberg Codes Pertaining to Landslides

The following Newberg codes, plans, and policies pertain to landslides:

1. Newberg Comprehensive Plan, *Areas Subject to Natural Hazards*. The section goal is to “To protect life and property from flooding and other natural hazards.” , Policies that support this goal in relation to landslides include:

Policy 5. In other areas of potential or existing hazards, development shall be subject to special conditions. Reasonable development may be permitted in these areas when it can be shown, based on sound engineering and planning criteria, that adverse impacts can be mitigated and kept to a minimum. Hazardous areas shall be lands with slopes 20% or greater, potential and existing slide areas, fault areas, and areas with severe soil limitations.

Policy 6. The City will discourage development on hazardous slope areas and natural resource areas in the Riverfront District. (Ordinance 2002-2564, April 15, 2002)

2. The following portions of the Municipal Code implement the Goal 7 policies of the Comprehensive Plan, regulating development on steep slopes, erosion control, and earthwork control:

- Municipal Code, Chapter 13.25, *Stormwater Management*, Article II *Erosion and sediment controls*.

Please review Volume I, Section 2 for additional information on this hazard. Additional information on how to prepare and mitigate for landslide hazards can be found in the DLCDC and DOGAMI [“Landslide Hazards Lane Use Guide for Oregon Communities”](#).

Severe Weather

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

Windstorm

The steering committee determined that the City’s probability for windstorm is **high** and that their vulnerability to windstorm is **moderate**.

Volume I, Section 2 describes the characteristics of windstorm hazards, history, 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 flooding and winter storms (ice, freezing rain, and very rarely, snow). Other severe weather events that may accompany windstorms, including thunderstorms, hail, lightning strikes, and tornadoes are generally negligible for Newberg.

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.

Damage from high winds generally has resulted in downed utility lines, and trees usually limited to several localized areas. 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 may cause localized urban flooding.

Please review Volume I, Section 2 for additional information on this hazard.

Winter Storm (Snow/Ice)

The steering committee determined that the City's probability for winter storm is **high** and that their vulnerability to winter storm is **high**.

Volume I, Section 2 describes the characteristics of winter storm hazards, history, 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.

Vulnerability Assessment

Due to insufficient data and resources, Newberg is currently unable to perform a quantitative risk assessment, or exposure analysis, for the windstorm and winter storm hazards. All areas within the City of Newberg are equally at risk of a windstorm or winter storm event.

Mitigation Activities

The City works to mitigate problems regarding windstorm and winter storm issues when they arise. Mitigation activities listed here include current mitigation programs and activities that are being implemented by Newberg agencies or organizations.

- ODOT is responsible for sanding and de-icing state managed roads including: Illinois Street, OR 99W, OR 219, and OR 240 within city limits.
- The City provides education on winter weather preparedness
- The City provides sandbags during times of flooding
- The City sands and removes snow from roads.
- The City closes roads prone to icy conditions and post hazard signs at other roads.
- The City has a tree trimming program to encourage property owners to trim hazard trees, and to maintain trees within public rights-of-way. Utility companies maintain trees along their utility easements.

City of Newberg Codes Pertaining to Windstorms and Winter Storms

The following Newberg codes, plans, and policies pertain to windstorms and winter storms:

1. The City of Newberg Municipal Code Chapter 15.500 provides standards for public infrastructure and utilities.
2. The City of Newberg Building Code (Municipal Code Chapter 14) regulates building material requirements and includes provisions for windstorms and winter storms.

Please review Volume I, Section 2 for additional information on this hazard.

Volcanic Event

The steering committee determined that the City's probability for a volcanic event is **low** and that their vulnerability to a volcanic event is **low**.

Volume I, Section 2 describes the characteristics of volcanic hazards, history, as well as the location, extent, and probability of a potential event within the region. Generally, an event that affects the Eastern portion of the County is likely to affect Newberg as well. Several volcanoes are located near Newberg, the closest of which are Mount Hood, Mount Adams, Mount Saint Helens, Mount Rainier, and the Three Sisters.

Due to Newberg'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). Although the City of Newberg is unlikely to experience lahars or lava flows, tephra (sand- sized or finer particles of volcanic rock that is ejected rapidly into the air from volcanic vents) drifts downwind from the explosions and can form a blanket-like deposit of ash. 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 heavier coating of ash. Tephra is a public health threat, and can damage agriculture and transportation systems (i.e., aircraft and on- the-ground vehicles). Tephra can also clog drainage systems and create major debris management problems. Within Newberg, public health would be a primary concern, and keeping transportation routes open/accessible would be important as well.

Vulnerability Assessment

Due to insufficient data and resources, Newberg is currently unable to perform a quantitative risk assessment, or exposure analysis, for this hazard.

Mitigation Activities

The existing volcanic event hazard mitigation activities are conducted at the county, regional, state, and federal levels and are described in the Yamhill County NHMP.

City of Newberg Codes Pertaining to Volcanic Events

The City does not have specific codes, plans, or policies that pertain to volcanic events:

Please review Volume I, Section 2 for additional information on this hazard.

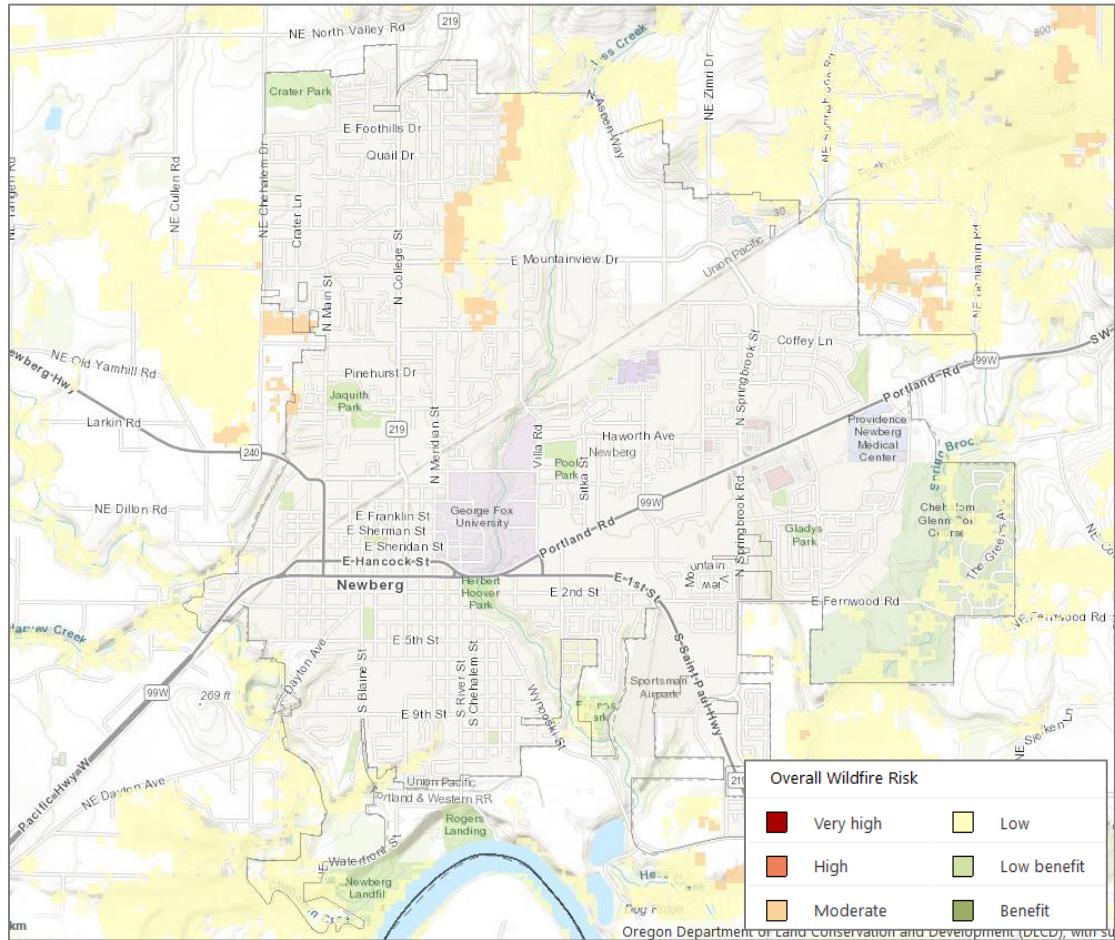
Wildfire

The steering committee determined that the City's probability for wildfire is **low** and that their vulnerability to wildfire is **low**.

The [Yamhill County Community Wildfire Protection Plan \(CWPP\)](#) was completed in August 2009 and revised in 2015. The CWPP is hereby incorporated into this NHMP addendum by reference, and it will serve as the wildfire section for this addendum.

Volume I, Section 2 describes the characteristics of wildland fire hazards, history, as well as the location, extent, and probability of a potential event within the region. The location, and extent of a wildland fire vary depending on fuel, topography, and weather conditions. Weather, and urbanization conditions are primarily at cause for the hazard level. Newberg has not experienced a wildfire within City limits. The city is surrounded by developed land and/or irrigated agricultural land. However, some wooded areas are a concern in the case of a wildfire event. Figure NA-8 shows overall wildfire risk in Newberg.

Figure NA-8 Overall Wildfire Risk



Source: [Oregon Wildfire Risk Explorer](#), date accessed April 16, 2020.

The forested areas within, and surrounding Newberg are interface areas. These areas are characterized by varying housing structures (often large houses on small lots, some with shake roofs), natural, and ornamental vegetation, and topography that may increase the risk for wildfire spreading (particularly to the north and northeast).

Most of the city has less severe (low) wildfire burn probability that includes expected flame lengths less than four feet under normal weather conditions.¹⁶ However, conditions vary widely and with local topography, fuels, and local weather (including wind) conditions. Under warm, dry, windy, and drought conditions expect higher likelihood of fire starts, higher intensity, more ember activity, and a more difficult to control wildfire that will include more fire effects and impacts. The potential community impacts, and vulnerabilities described in Volume I, Section 2 are generally accurate for the City as well. Newberg's fire response is provided by Tualatin Valley Fire & Rescue from Station 20 (downtown) and Station 21 (northeast). The CWPP assesses wildfire risk, maps wildland urban interface areas, and includes actions to mitigate wildfire risk (all identified actions are outside the city limits). The City will update the City's wildfire risk assessment if the CWPP presents better

¹⁶ [Oregon Wildfire Risk Explorer](#),

data during future updates (an action item is included to participate in future updates to the CWPP).

Vulnerability Assessment

Due to insufficient data and resources, Newberg is currently unable to perform a quantitative risk assessment for this hazard.

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).

Exposed infrastructure including wastewater main lines, major water lines, natural gas pipeline and fiber optic lines are buried, decreasing their vulnerability to damage from wildfire hazards. However, wildfire conditions could potentially limit or delay access for the purposes of operation or repair.

Mitigation Activities

The Tualatin Valley Fire & Rescue District works to mitigate problems regarding wildfire issues when they arise. Wildfire mitigation activities listed here include current mitigation programs and activities that are being implemented by Newberg agencies or organizations.

City of Newberg Codes Pertaining to Wildfires

The following Newberg codes, plans, and policies pertain to wildfires:

1. The City of Newberg Municipal Code Chapter 15.500 provides standards for public infrastructure and utilities.
2. The City of Newberg Building Code (Municipal Code Chapter 14) regulates building material requirements and includes provisions for Fire Prevention and Protection (Article 6).

Please review the [Yamhill County Community Wildfire Protection Plan \(CWPP\)](#) and [Volume I, Section 2](#) for additional information on this hazard.

ATTACHMENT A: ACTION ITEM FORMS

In the previous plan the City identified three high priority action items. These actions are those the city considered during the 2015-2020 Implementation and Maintenance period and they are listed in Table NA-8 along with their status.

Table NA-8 2015 High Priority Action Item Status

2014 Priority Action ID	Status (2020 Action ID) (Complete, Deferred, Deleted, Ongoing)	Comment	Description
Action #1	Ongoing (Multi-hazard #2)	Description modified. Lack of funding and capacity	Integrate the Mitigation Plan findings into planning & regulatory documents & programs and into enhanced emergency planning.
Action #2	Ongoing (Multi-hazard #3)	Description modified. Coordinating with County.	Develop early warning test program: partnering w/ NOAA, city police, fire department to coordinate test
Action #3	Ongoing (Earthquake #1)	Description modified. Public safety building retrofitted.	Review critical facilities & gov't buildings structures

Table NA-1 provide a summary list of 2020 NHMP Actions for the city. Each high priority action item has a corresponding action item worksheet describing the activity, identifying the rationale for the project, identifying potential ideas for implementation, and assigning coordinating and partner organizations. The action item worksheets can assist the community in pre-packaging potential projects for grant funding. The worksheet components are described below.

ALIGNMENT WITH EXISTING PLANS/POLICIES

The City NHMP includes a range of action items that, when implemented, will reduce loss from hazard events in the City. Within the plan, FEMA requires the identification of existing programs that might be used to implement these action items. The City addresses statewide planning goals and legislative requirements through its comprehensive land use plan, capital improvements plan, mandated standards and building codes. To the extent possible, the City will work to incorporate the recommended mitigation action items into existing programs and procedures. Each action item identifies related existing plans and policies.

STATUS/RATIONALE FOR PROPOSED ACTION ITEM

Action items should be fact-based and tied directly to issues or needs identified throughout the planning process. Action items can be developed at any time during the planning process and can come from several sources, including participants in the planning process,

noted deficiencies in local capability, or issues identified through the risk assessment. The rationale for proposed action items is based on the information documented in this addendum and within Volume I, Section 2. The worksheet provides information on the activities that have occurred since the previous plan for each action item.

IDEAS FOR IMPLEMENTATION

The ideas for implementation offer a transition from theory to practice and serve as a starting point for this plan. This component of the action item is dynamic, since some ideas may prove to not be feasible, and new ideas may be added during the plan maintenance process. Ideas for implementation include such things as collaboration with relevant organizations, grant programs, tax incentives, human resources, education and outreach, research, and physical manipulation of buildings and infrastructure.

COORDINATING (LEAD) ORGANIZATION:

The coordinating organization is the public agency with the regulatory responsibility to address natural hazards, or that is willing and able to organize resources, find appropriate funding, or oversee activity implementation, monitoring and evaluation.

INTERNAL AND EXTERNAL PARTNERS:

The internal and external partner organizations listed in the Action Item Worksheets are potential partners recommended by the project steering committee but not necessarily contacted during the development of the plan. The coordinating organization should contact the identified partner organizations to see if they are capable of and interested in participation. This initial contact is also to gain a commitment of time and/or resources toward completion of the action items.

Internal partner organizations are departments within the City or other participating jurisdiction that may be able to assist in the implementation of action items by providing relevant resources to the coordinating organization.

External partner organizations can assist the coordinating organization in implementing the action items in various functions and may include local, regional, state, or federal agencies, as well as local and regional public and private sector organizations.

PLAN GOALS ADDRESSED:

The plan goals addressed by each action item are identified as a means for monitoring and evaluating how well the mitigation plan is achieving its goals, following implementation.

TIMELINE:

All broad scale action items have been determined to be ongoing, as opposed to short (0 to 2 years), medium (2-5 years), or long (6 or more years). This is because the action items are broad ideas, and although actions may be implemented to address the broad ideas, the efforts should be ongoing.

POTENTIAL FUNDING SOURCE

Where possible potential funding sources have been identified. Example funding sources may include: Federal Hazard Mitigation Assistance programs, state funding sources such as

the Oregon Seismic Rehabilitation Grant Program, or local funding sources such as capital improvement or general funds. An action item may include several potential funding sources.

ESTIMATED COST

A rough estimate of the cost for implementing each action item is included. Costs are shown in general categories showing low, medium, or high cost. The estimated cost for each category is outlined below:

Low - Less than \$50,000

Medium - \$50,000 – \$100,000

High - More than \$100,000

Multi-Hazard #1

Proposed Action Item:		Alignment with Plan Goals:	
Develop, enhance, and implement public education and information materials concerning mitigation, preparedness and safety procedures for identified natural hazards.		Gopal 1, Goal 2, Goal 3, Goal 6, Goal 8	
Alignment with Existing Plans/Policies:			
Emergency Operations Plan, Community Wildfire Protection Plan			
2020 Status/Rationale for Proposed Action Item:			
<p>The natural hazard sections of the City's addendum (Volume II) to the Yamhill Co. NHMP and Yamhill County's risk assessment (Volume I, Section 2 and Volume III, Appendix C) identify vulnerable populations and property within the various identified hazard areas. Increasing public outreach to educate residents about their risk to natural hazards affecting their community as well as what to do in the event of a natural hazard will help decrease their vulnerability to natural hazards.</p> <p>The Disaster Mitigation Act of 2000 requires communities to identify how the community will continue to involve the public in the plan maintenance process [201.6(c)(4)(iii)]. Educating landowners on how to mitigate the effects of natural hazards helps keep the public informed of what is being done with the plan, how the City is working to mitigate its risk to natural hazards, and allows for feedback and suggestions from the public for improving, updating, and maintaining the plan.</p>			
Ideas for Implementation:			
<p>Distribution of natural hazard information describing dangers and evacuation routes for visitors to Newberg and continued educational outreach for residents and business owners.</p> <p>Update brochures with new information provided as part of reports provided by DOGAMI, ODF, DLCD, and FEMA (among others).</p> <p>Identify and use existing mechanisms for public outreach (e.g., SWCD, NRCS, watershed councils, OSU Extension, etc.).</p>			
Coordinating Organization:		TVF&R, Emergency Management	
Internal Partners:		External Partners:	
Public Works		DOGAMI, DLCD, FEMA, ODF	
Potential Funding Sources:		Estimated cost:	Timeline:
General fund, grants		Low	<input type="checkbox"/> Short (0-2 years) <input type="checkbox"/> Medium (2-5 years) <input type="checkbox"/> Long (6+ years) <input checked="" type="checkbox"/> Ongoing
Form Submitted by:	2019-20 NHMP Steering Committee		
Priority:	High		

Multi-Hazard #2

Proposed Action Item:		Alignment with Plan Goals:	
Integrate the Mitigation Plan findings into planning & regulatory documents & programs and into enhanced emergency planning.		Goal 1, Goal 4, Goal 5, Goal 6, Goal 7, Goal 8	
Alignment with Existing Plans/Policies:			
Comprehensive Plan, Development Code, Building Code			
2020 Status/Rationale for Proposed Action Item:			
<p>Comprehensive plans provide the framework for the physical design of a community. They shape overall growth and development while addressing economic, environmental and social issues. Oregon's statewide goals are accomplished through local comprehensive plans. State Law requires local governments to adopt a comprehensive plan and the zoning and land-division ordinances needed to put the plan into action.</p> <p>Integration of NHMPs into comprehensive plans and other plans will help to reduce a community's vulnerability to natural hazards, support in mitigation activities, help to increase the speed in which action items are implemented and therefore the speed in which communities recover from natural disasters.</p> <p>Integration of NHMPs into local plans gives the action items identified in the NHMP legal status for guiding local decision-making regarding land use and/ or capital expenditures. .</p>			
Ideas for Implementation:			
<p>Conduct a policy crosswalk of the NHMP, the comprehensive plan, and other planning documents, to identify areas of possible integration.</p> <p>Integrate natural hazards information and policies into the comprehensive plan and other plans.</p> <p>Engage in collaborative planning and integration.</p> <p>Coordinate future NHMP and comprehensive plan reviews and updates.</p>			
Coordinating Organization:		Planning	
Internal Partners:		External Partners:	
Emergency Management		DLCD	
Potential Funding Sources:		Estimated cost:	Timeline:
General fund, utility rates/fees		Low	<input checked="" type="checkbox"/> Short (0-2 years) <input type="checkbox"/> Medium (2-5 years) <input type="checkbox"/> Long (6+ years) <input type="checkbox"/> Ongoing
Form Submitted by:	2019-20 NHMP Steering Committee		
Priority:	High		

Multi-Hazard #3

Proposed Action Item:		Alignment with Plan Goals:	
Develop early warning test program: partnering with NOAA, city police, fire department to coordinate test.		Goal 1, Goal 3, Goal 4, Goal 6, Goal 8	
Alignment with Existing Plans/Policies:			
2020 Status/Rationale for Proposed Action Item:			
The Disaster Mitigation Act of 2000 requires communities to identify actions and projects that reduce the effects of hazards on the community [201.6(c)(3)(ii)]. Improving technology capacity will allow widespread dissemination of information, thus decreasing risk to residents and visitors during a hazard event.			
Ideas for Implementation:			
Develop coordinated early warning system between the City, TVF&R, Police, 911, and NOAA.			
Coordinating Organization:		Emergency Management	
Internal Partners:		External Partners:	
TVF&R, Police, 911		NOAA	
Potential Funding Sources:		Estimated cost:	Timeline:
General fund		Low	<input checked="" type="checkbox"/> Short (0-2 years) <input type="checkbox"/> Medium (2-5 years) <input type="checkbox"/> Long (6+ years) <input type="checkbox"/> Ongoing
Form Submitted by:	2019-20 NHMP Steering Committee		
Priority:	High		

Earthquake #1

Proposed Action Item:		Alignment with Plan Goals:	
Conduct seismic strength evaluations of critical facilities and infrastructure to identify vulnerabilities and seismically retrofit (structural and nonstructural) identified critical facilities and infrastructure to meet life safety standards in order to continue operations post-earthquake.		Goal 2, Goal 3, Goal 4, Goal 6, Goal 7, Goal 8	
Alignment with Existing Plans/Policies:			
2020 Status/Rationale for Proposed Action Item:			
Currently, all new facilities must comply with and meet seismic standards. If someone moves into an old building, they must upgrade to current standards. DOGAMI did a windshield survey of schools, fire stations, police, and city halls (2007 RVS). The focus was on action of existing buildings and information was shared with participants.			
Ideas for Implementation:			
Provide information to government building and school facility managers and teachers on nonstructural mitigation techniques including: securing bookcases, filing cabinets, light fixtures, and other objects that can cause injuries and block exits; Encourage facility managers, business owners, and teachers to refer to FEMA's practical guidebook: Reducing the Risks of Nonstructural Earthquake Damage; Encourage homeowners and renters to use Is Your Home Protected from Earthquake Disaster? A Homeowner's Guide to Earthquake Retrofit (IBHS) for economic and efficient mitigation techniques; Use the FEMA 154 seismic evaluations generated by DOGAMI to prioritize critical and essential buildings for upgrades; Explore partnerships to provide retrofitting classes for homeowners, renters, building professionals, and contractors; and Target development located in potential fault zones or in unstable soils for intensive education and retrofitting resources.			
Coordinating Organization:		Emergency Management	
Internal Partners:		External Partners:	
Administration, Community Development, Public Works, TVF&R, Police		DOGAMI	
Potential Funding Sources:		Estimated cost:	Timeline:
General funds, utility fees, grants (SRGP, HMA)		High	<input type="checkbox"/> Short (0-2 years) <input type="checkbox"/> Medium (2-5 years) <input checked="" type="checkbox"/> Long (6+ years) <input type="checkbox"/> Ongoing
Form Submitted by:	2019-20 NHMP Steering Committee		
Priority:	High		

Wildfire #1

Proposed Action Item:		Alignment with Plan Goals:	
Coordinate wildfire mitigation action items through the Yamhill County Community Wildfire Protection Plan.		Goal 1, Goal 2, Goal 3, Goal 4, Goal 5, Goal 6, Goal 7, Goal 8	
Alignment with Existing Plans/Policies:			
2020 Status/Rationale for Proposed Action Item:			
The wildfire mitigation action items provide direction on specific activities that organizations and residents in Newberg/Yamhill County can take to reduce wildfire hazards.			
Ideas for Implementation:			
Implement high and medium priority projects including defensible space and fuels reduction projects identified in the CWPP.			
Coordinating Organization:		TVF&R	
Internal Partners:		External Partners:	
Community Development		ODF	
Potential Funding Sources:		Estimated cost:	Timeline:
General fund		Low	<input type="checkbox"/> Short (0-2 years) <input type="checkbox"/> Medium (2-5 years) <input type="checkbox"/> Long (6+ years) <input checked="" type="checkbox"/> Ongoing
Form Submitted by:	2019-20 NHMP Steering Committee		
Priority:	High		

ATTACHMENT B: PUBLIC INVOLVEMENT SUMMARY

Members of the steering committee provided edits and updates to the NHMP prior to the public review period as reflected in the final document.

To provide the public information regarding the draft NHMP addendum, and provide an opportunity for comment, an announcement (see text below) was announced on the city's website and an email contact was provided for public comment.

During the public review period there were no comments provided.

Newberg Seeks Public Input on Update to Natural Hazard Mitigation Plan


(NEWBERG, OR) - As part of the process of the 5 year update to the existing Natural Hazard Mitigation Plan (NHMP), the City of Newberg is seeking public input on the plan. This work is being performed in cooperation with the University of Oregon and the Oregon Office of Emergency Management utilizing funds obtained from FEMA.

A natural hazard mitigation plan provides communities with a set of goals, action items, and resources designed to reduce risk from future natural disaster events. Engaging in mitigation activities provides jurisdictions with a number of benefits, including reduced loss of life, property, essential services, critical facilities, and economic hardship, reduced short-term and long-term recovery and reconstruction costs, increased cooperation and communication within the community through the planning process, and increased potential for state and federal funding for recovery and reconstruction projects.

An electronic version of the updated draft Newberg NHMP addendum will be available for formal public comment beginning July 13, 2020. The Public Comment period will close on July 27, 2020. The last update was in 2013 and this is the appointed time for amendments from all agencies in Yamhill County. [Click here to view the draft.](#)

If you have any comments or questions regarding the Newberg NHMP addendum or the update process in general, please contact Dan Weinheimer City Manager at (503) 537-1207 or Dan.Weinheimer@NewbergOregon.gov or Michael Howard, Assistant Program Director for the Oregon Partnership for Disaster Resilience at mrhoward@uoregon.edu.

Supporting Documents

 Draft Newberg Addendum to County Natural Hazard Mitigation Plan July 2020 (2 MB)

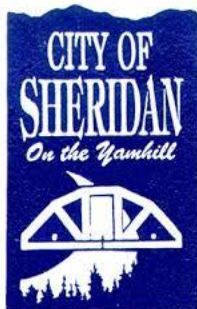
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City of Sheridan Addendum to the Yamhill County Multi-Jurisdictional Hazard Mitigation Plan



Photo Credit M.O. Stevens

Effective: December 22, 2020 through December 21, 2025



Prepared for:

City of Sheridan

Prepared by:

**University of Oregon
Institute for Policy Research and Engagement
Oregon Partnership for Disaster Resilience**

Planning grant funding provided by:



FEMA

Federal Emergency Management Agency (FEMA)
Pre-Disaster Mitigation Program
Grant: HMGP-DR4328-5-P-OR
Disaster Award Number: 97.039

and

Additional Support Provided by:



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FEMA

January 20, 2021

The Honorable Casey Kulla
Chair Kulla, Yamhill County Board of Commissioners
535 NE 5th St.
McMinnville, Oregon 97128

Dear Chair Kulla:

On December 22, 2020, the U.S. Department of Homeland Security's Federal Emergency Management Agency (FEMA) Region 10, approved the Yamhill County Hazard Mitigation Plan as a multi-jurisdictional local plan as outlined in Code of Federal Regulations Title 44 Part 201. This approval provides the below jurisdictions eligibility to apply for the Robert T. Stafford Disaster Relief and Emergency Assistance Act's, Hazard Mitigation Assistance grants projects through December 21, 2025, through your state:

Yamhill County	City of Amity	City of Carlton	City of Dayton
City of McMinnville	City of Newberg	City of Sheridan	City of Yamhill

FEMA individually evaluates all application requests for funding according to the specific eligibility requirements of the applicable program. Though a specific mitigation activity or project identified in the plan may meet the eligibility requirements, it may not automatically receive approval for FEMA funding under any of the aforementioned programs.

Approved mitigation plans may be eligible for points under the National Flood Insurance Program's Community Rating System (CRS). For additional information regarding the CRS, please visit: www.fema.gov/national-flood-insurance-program-community-rating-system or contact your local floodplain manager. Over the next five years, we encourage your communities to follow the plan's schedule for monitoring and updating, and to develop further mitigation actions. To continue eligibility, jurisdictions must review, revise as appropriate, and resubmit the plan within five years of the original approval date.

If you have questions regarding your plan's approval or FEMA's mitigation grant programs, please contact Joseph Murray, Planner with Oregon Office of Emergency Management, at (503) 378-2911, who locally coordinates and administers these efforts.

Sincerely,

Kristen Meyers, Director
Mitigation Division

Enclosure

cc: Amie Bashant, Oregon Office of Emergency Management

EG:vl

RESOLUTION 2020-F

A Resolution Adopting the City of Sheridan Representation in the Updates to the Yamhill County Multi-Jurisdictional Natural Hazards Mitigation Plan

Whereas, the City of Sheridan recognizes the threat that natural hazards pose to people, property and infrastructure within our community; and

Whereas, undertaking hazard mitigation actions will reduce the potential for harm to people, property and infrastructure from future hazard occurrences; and

Whereas, an adopted Natural Hazards Mitigation Plan is required as a condition of future funding for mitigation projects under multiple FEMA pre- and post-disaster mitigation grant programs; and

Whereas, the City of Sheridan has fully participated in the FEMA prescribed mitigation planning process to prepare the *Yamhill County, Multi-Jurisdictional Natural Hazard Mitigation Plan*, which has established a comprehensive, coordinated planning process to eliminate or minimize these vulnerabilities; and

Whereas, the City of Sheridan has identified natural hazard risks and prioritized a number of proposed actions and programs needed to mitigate the vulnerabilities of the City of Sheridan to the impacts of future disasters within the *Yamhill County, Multi-Jurisdictional Natural Hazard Mitigation Plan*; and

Whereas, these proposed projects and programs have been incorporated into the *Yamhill County, Multi-Jurisdictional Natural Hazard Mitigation Plan* that has been prepared and promulgated for consideration and implementation by the cities of Yamhill County; and

Whereas, the Oregon Office of Emergency Management and Federal Emergency Management Agency, Region X officials have reviewed the *City of Sheridan addendum* to the *Yamhill County Multi-Jurisdictional Natural Hazard Mitigation Plan* and pre-approved it (dated, September 10, 2020) contingent upon this official adoption of the participating governments and entities;

Whereas, the NHMP is comprised of three volumes: Volume I: Basic Plan, Volume II: Jurisdictional Addenda, and Volume III: Appendices, collectively referred to herein as the NHMP; and

Whereas, the NHMP is in an on-going cycle of development and revision to improve its effectiveness; and

Whereas, City of Sheridan adopts the NHMP and directs the City Manager to develop, approve, and implement the mitigation strategies and any administrative changes to the NHMP.

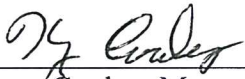
Now, Therefore, Be It Resolved, that the City of Sheridan adopts *the Yamhill County Multi-Jurisdictional Natural Hazards Mitigation Plan* as an official plan; and

Be it further resolved, that the City Recorder shall submit Adopted Resolution 2020-F to the Oregon Office of Emergency Management and Federal Emergency Management Agency, Region X officials to enable final approval of the *Yamhill County Multi-Jurisdictional Natural Hazards Mitigation Plan*.

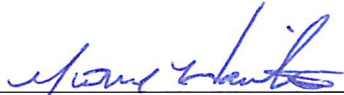
Approved by the City Council of the City of Sheridan at the Council Meeting held on the 16th day of November 2020 by the following votes:

Ayes: Hebert; Davis; Baer; Cox; Acuff; Walker
Nays: -0-
Absent: -0-
Abstain: -0-

DATED this 16th day of November 2020



Harry Cooley, Mayor

Attest: 

Yvonne Hamilton, CMC, City Recorder

Purpose

This is an update of the Sheridan addendum to the Yamhill County Multi-Jurisdictional Natural Hazard Mitigation Plan (NHMP). This addendum supplements information contained in Volume I (Basic Plan) which serves as the NHMP foundation, and Volume III (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 Sheridan's addendum are further discussed throughout the NHMP, and within Volume III, Appendix B, which provides an overview of alterations to the document that took place during the update process.

Sheridan adopted their addendum to the Yamhill County Multi-jurisdictional NHMP on **November 16, 2020**. FEMA Region X approved the Yamhill County NHMP and the City's addendum on **December 22, 2020**. With approval of this NHMP the City is now eligible to apply for the Robert T. Stafford Disaster Relief and Emergency Assistance Act's hazard mitigation project grants through **December 21, 2025**.

Mitigation Plan Mission

The NHMP mission states the purpose and defines the primary functions of the 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 City concurs with the mission statement developed during the Yamhill County planning process (Volume I, Section 3):

To promote public policy and mitigation activities which will enhance the safety to life and property from natural hazards.

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

Mitigation Plan Goals

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

The City concurs with the goals developed during the Yamhill County planning process (Volume I, Section 3). All NHMP goals are important and are listed below in no 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.

Below is a list of the NHMP goals:

GOAL 1: EMERGENCY OPERATIONS

- Coordinate natural hazard mitigation activities, where appropriate, with emergency operations plans and procedures and with other agencies.

GOAL 2: EDUCATION AND OUTREACH

- Develop and implement education and outreach programs to increase public awareness of the risks associated with natural hazards.

GOAL 3: PARTNERSHIPS

- Develop effective partnerships with public and private sector organizations and significant agencies and businesses for future natural hazard mitigation efforts.
- Coordinate natural hazard mitigation actions between the County and local jurisdictions to create more cohesive and effective hazard mitigation efforts.

GOAL 4: PREVENTIVE

- Develop and implement activities to protect human life, commerce, and property from natural hazards.
- Reduce losses and repetitive damage for chronic hazard events while promoting insurance coverage for catastrophic hazards.

GOAL 5: NATURAL RESOURCES UTILIZATION

- Link natural resources management, land use planning, and watershed planning with natural hazard mitigation activities to protect natural systems and allow them to serve natural hazard mitigation functions.

GOAL 6: IMPLEMENTATION

- Implement strategies to mitigate the effects of natural hazards and increase the quality of life and resilience of economies in Yamhill County.

GOAL 7: DEVELOPMENT

- Communities appropriately apply development standards that consider the potential impacts of natural hazards.

GOAL 8: DOCUMENTATION

- Document and evaluate progress in achieving hazard mitigation strategies and action items.

Process and Participation

This section of the NHMP addendum addresses 44 CFR 201.6(a)(3), *Participation*.

In addition to establishing a comprehensive community-level mitigation strategy, the Disaster Mitigation Act of 2000 (DMA2K), and the regulations contained in 44 CFR 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 pre-, and post-disaster mitigation project grants.

The Oregon Partnership for Disaster Resilience (OPDR) at the University of Oregon's Institute for Policy Research and Engagement (IPRE) collaborated with the Oregon Office of Emergency Management (OEM), Yamhill County, and Sheridan to update their NHMP. This project is funded through the Federal Emergency Management Agency's (FEMA) Hazard Mitigation Grant Program for DR-4328 (HMGP-DR-4328-OR-5-P). Members of the Sheridan NHMP Steering committee also participated in the County NHMP update process (Volume III, Appendix B).

The Yamhill County NHMP, and Sheridan addendum, are the result of a collaborative effort between citizens, public agencies, non-profit organizations, the private sector, and regional organizations. The Sheridan NHMP Steering Committee guided the process of developing the NHMP.

Convener and Committee

The Sheridan City Manager serves as the NHMP addendum convener. The convener of the NHMP will take the lead in implementing, maintaining, and updating the addendum to the Yamhill County NHMP in collaboration with the designated convener of the Yamhill County NHMP (Yamhill County Emergency Manager).

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

This addendum reflects decisions made at the designated meetings, and during subsequent work, and communication with Yamhill County Emergency Manager, and 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, action items, and community profile.

The Sheridan steering committee was comprised of the following representatives:

- Convener, Frank Sheridan, City Manager
- Jim Anderson, Public Works Director
- Laury Hall, Public Works Clerk
- Damon Schulze, Deputy Chief, Sheridan/West Valley Rural Fire Districts
- Steven Sugg, Superintendent, Sheridan School District
- Jim Jacks, City Planner

Public Participation

Public participation was achieved by posting the NHMP publicly and providing community members the opportunity to make comments and suggestions during the review process. Community members were also provided an opportunity for comment via a survey administered by IPRE (Volume III, Appendix F). During the City public review period (Attachment B) there were no comments provided.

Implementation and Maintenance

The City Council will be responsible for adopting the Sheridan addendum to the Yamhill County NHMP. This addendum designates the 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 Sheridan 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 Manager 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; 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 City will utilize the same action item prioritization process as the County (Volume I, Section 4).

Implementation through Existing Programs

This NHMP is strategic and non-regulatory in nature, meaning that it does not necessarily set forth any new policy. It does, however, provide: (1) a foundation for coordination and collaboration among agencies and the public in the city; (2) identification and prioritization of future mitigation activities; and (3) aid in meeting federal planning requirements and qualifying for assistance programs. The mitigation plan works in conjunction with other city plans and programs including the Comprehensive Land Use Plan, Capital Improvements Plan, and Building Codes, as well as the [Yamhill County NHMP](#), and the [State of Oregon NHMP](#).

The mitigation actions described herein (and priority actions in Attachment A) 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, Sheridan 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. Implementation opportunities are further defined in action items when applicable.

Future development without proper planning may result in worsening problems associated with natural hazards. Sheridan's acknowledged comprehensive plan is the City of Sheridan Comprehensive Plan. The City implements the plan through the Community Development Code.

Sheridan currently has the following plans that relate to natural hazard mitigation. For a complete list visit the City's [website](#):

- [Comprehensive Plan](#) (adopted 1979, amended 1992)
- [Sheridan Municipal Code and Development Code](#)
 - [Title 13: Public Services](#)
 - [Chapter 13.08 Water Emergencies](#)
 - [Title 15: Buildings and Construction](#)
 - [Title 16: Development Code](#)
 - [Chapter 16.280 Flood Plain Overlay District](#)
 - [Chapter 16.290 Hillside Development Overlay District](#)
- Building Code, [2017 Oregon State Building Code](#) based on 2015 International Residential Code (IRC), and 2012 International Building Code (*to be updated to the 2020 Oregon State Building Code, anticipated October 2020*)
- Public Works Design Standards
- [Wastewater Facility Plan](#) (2013)
- [Transportation System Plan](#) (1999)
- [Water System Master Plan](#) (2007)
- [Water Source/Supply Facility Plan](#) (2000, addendum 2002)
- [Yamhill County Water Supply Analysis](#) (2008)
- [Stoney Mountain Reservoir Dam – Inspection Report](#) (2012)
- [Storm Drainage Master Plan](#) (2009)
- Sheridan School District: Emergency Operations Plan (2019)
- Sheridan School District: Safe and Healthy Schools Plan (2019)

Other plans:

- [Yamhill County Community Wildfire Protection Plan](#) (2009, revised Nov. 2015)

Government Structure

The Sheridan City Charter establishes a Council/Mayor form of government, which vests policy authority in a volunteer City Council. Administrative authority for day-to-day operations is provided by an appointed, professional City Manager. The Sheridan City Council consists of a Mayor, who is elected at-large to serve a two-year term, and six Councilors who serve four-year terms. At least three Council positions are up for election every two years. Councilors are elected at-large. The three candidates who receive the highest number of votes are elected to the vacant seats. The Council meets at least once per month at City Hall. The agenda of each meeting includes time for citizen comment.

The City of Sheridan currently has the following departments which have a role in natural hazard mitigation:

Administration services are provided by the City Manager and include strategic planning, budget and finance, and development of public policy recommendations to the City Council. Key staff include a City Manager, City Recorder, Finance Director, City Planner, Building Official, and Code Enforcement Officer.

Public Works provides many of the basic urban services to the citizens of Sheridan, including water, wastewater, street, and park systems, and their maintenance and repair.

Building services are provided through a contract with Yamhill County and include plan review and inspections on commercial, industrial and residential developments.

Planning services is provided through a contract with the Mid-Willamette Valley Council of Governments and includes all long range and current planning for new development, as well as the City's flood plain management zone. Planning is also responsible for implementation of the Comprehensive Plan.

Police services are provided through a contract with the Yamhill County Sheriff include law enforcement activities. Emergency management including emergency preparedness, mitigation, response and recovery efforts for Sheridan during emergencies, disasters, or disruptions is provided by Yamhill County Emergency Management.

Fire protection services are provided through a contract with Sheridan Fire District. The fire station is in Sheridan. Services include fire suppression, hazardous materials incidents, and disaster response. Non-emergency services include fire prevention and inspection services, code enforcement, public safety education services/CPR training, and fire extinguisher use.

Continued Public Participation

An open public involvement process is essential to the development of an effective NHMP. To develop a comprehensive approach to reducing the effects of natural disasters, the planning process shall include opportunities for the public, neighboring communities, local, and regional agencies, as well as, private, and non-profit entities to comment on the NHMP during review.¹ Keeping the public informed of efforts to reduce its risk to future natural hazard events is important for successful NHMP implementation, and maintenance. As such, the City is committed to involving the public in the NHMP review and update process (Volume I, Section 4). The City posted the plan update for public comment before FEMA approval, and after approval will maintain the plan on the City's website:

<https://www.cityofsheridanor.com/>

NHMP Maintenance

The Yamhill County NHMP, and City addendum will be updated every five years in accordance with the update schedule outlined in the Disaster Mitigation Act of 2000. During the County NHMP update process, the City will also review, and update its addendum

¹ Code of Federal Regulations, Chapter 44. Section 201.6, subsection (b). 2015

(Volume I, Section 4). The convener will be responsible for convening the steering committee to address the questions outlined below.

- Are there new partners that should be brought to the table?
- Are there new local, regional, state or federal policies influencing natural hazards that should be addressed?
- Has the community successfully implemented any mitigation activities since the NHMP was last updated?
- Have new issues or problems related to hazards been identified in the community?
- Are the actions still appropriate given current resources?
- Have there been any changes in development patterns that could influence the effects of hazards?
- Have there been any significant changes in the community's demographics that could influence the effects of hazards?
- Are there new studies or data available that would enhance the risk assessment?
- Has the community been affected by any disasters? Did the NHMP accurately address the impacts of this event?

These questions will help the steering committee determine what components of the mitigation plan need updating. The steering committee will be responsible for updating any deficiencies found in the NHMP.

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) were first developed during the 2009 NHMP planning process and revised during subsequent NHMP updates. During these processes, the steering committee assessed the City's risk, identified potential issues, and developed a mitigation strategy (action items).

During the 2019-2020 update process the City re-evaluated their mitigation strategy (action items). During this process action items were updated, noting what accomplishments had been made, and whether the actions were still relevant; any new action items were identified at this time (see Volume III, Appendix B for more information on changes to action items).

Priority Action Items

Table SA-1 presents a list of mitigation actions. The steering committee 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 in **bold** text with grey 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 steering committee in terms of implementation, the steering committee 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 detailed information for each high priority action. Full text of the plan goals referenced in Table SA-1 is located on page SA-2.

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Table SA-I Sheridan Action Items

Natural Hazard Action ID	Action Item	Coordinating Organization (Lead)	Partners	Potential Funding	Cost	Timing	Plan Goals Addressed							
							Goal 1	Goal 2	Goal 3	Goal 4	Goal 5	Goal 6	Goal 7	Goal 8
Multi-Hazard Actions														
Multi-Hazard #1	Develop, enhance, and implement public education and information materials concerning mitigation, preparedness and safety procedures for identified natural hazards.	Planning	Public Works, Fire District, Police, School District, Administration	General fund, grants	L	Ongoing	✓	✓	✓			✓	✓	
Multi-Hazard #2	Incorporate mitigation planning provisions into all community planning processes such as comprehensive, capital improvement, land use, transportation plans, zoning and building ordinances, community development processes, etc. to demonstrate multi-benefit considerations and facilitate using multiple funding source consideration.	Planning	Public Works, Administration, Yamhill County	General fund, utility rates	M	Medium	✓			✓	✓	✓	✓	
Multi-Hazard #3	Identify critical facilities, especially fire and police departments, without emergency power and encourage these facilities to secure emergency power to mitigate power outage events due to natural hazard events. Consider solar battery options due to PGE policy changes during fire risk. Consider outreach to private property owners.	Public Works	Planning, Fire, Administration, School District, PGE/BPA	General fund, utility rates	H	Medium	✓		✓			✓	✓	

Natural Hazard Action ID	Action Item	Coordinating Organization (Lead)	Partners	Potential Funding	Cost	Timing	Plan Goals Addressed							
							Goal 1	Goal 2	Goal 3	Goal 4	Goal 5	Goal 6	Goal 7	Goal 8
Multi-Hazard #4	Collaborate with local power company to increase power line wire size and incorporate quick disconnects (break away devices) to reduce ice load and power line failure during severe wind or winter ice storm events.	Administration	Planning, Public Works	General fund, grants	L	Medium	✓	✓	✓	✓		✓		✓
Multi-Hazard #5	Develop vegetation projects to restore clear cut and riverine erosion damage and to increase landslide susceptible slope stability.	Public Works	Planning, Engineering, Administration	General fund, grants, Utility rates	H	Short	✓	✓	✓	✓		✓		✓
Multi-Hazard #6	Plan for solar + battery storage systems, which can serve as mini power-supply stations or provide residents the ability to shelter in place after any electricity supply-disrupting event, at varying scales (project, neighborhood and district) and locations (critical City facilities, low-income housing, community gathering spots).	Administration	Planning, Public Works, Engineering, Administration	General fund, grants, Utility rates	H	Long	✓	✓	✓	✓		✓		✓
Multi-Hazard #7	Promote resilience, response, mitigation, and recovery planning for local businesses to continue operating after a disaster.	Administration	Planning, Public Works, Police, Fire, Emergency Management	General funds, grants, private investment	L	Ongoing	✓	✓	✓	✓		✓	✓	✓

Natural Hazard Action ID	Action Item	Coordinating Organization (Lead)	Partners	Potential Funding	Cost	Timing	Plan Goals Addressed							
							Goal 1	Goal 2	Goal 3	Goal 4	Goal 5	Goal 6	Goal 7	Goal 8
Drought Actions														
Drought #1	Implement actions identified in the Water System Master Plan to assure adequate water supply for residents, businesses, and fire protection.	Public Works	Planning, Administration	General fund, grants, utility fees	H	Ongoing	✓	✓	✓	✓		✓	✓	✓
Earthquake Actions														
Earthquake #1	Conduct seismic strength evaluations of critical facilities and infrastructure to identify vulnerabilities and seismically retrofit (structural and nonstructural) identified critical facilities and infrastructure to meet life safety standards in order to continue operations post-earthquake.	Public Works	School District, Fire District, Planning, Administration	General funds, utility fees, grants (SRGP)	H	Long		✓	✓	✓		✓	✓	✓
Earthquake #2	Encourage utility companies to evaluate and harden vulnerable infrastructure elements for sustainability.	Public Works	Utilities, Planning, Administration	General fund, permit fees	L	Ongoing		✓	✓	✓		✓	✓	✓
Earthquake #3	Educate property owners about structural and non-structural retrofitting of vulnerable buildings and encourage retrofit.	Planning	FEMA, DLCD, OEM	General fund, permit fees	L	Ongoing		✓	✓	✓				

Natural Hazard Action ID	Action Item	Coordinating Organization (Lead)	Partners	Potential Funding	Cost	Timing	Plan Goals Addressed							
							Goal 1	Goal 2	Goal 3	Goal 4	Goal 5	Goal 6	Goal 7	Goal 8
Flood Actions														
Flood #1	Ensure continued compliance in the National Flood Insurance Program (NFIP) through enforcement of local floodplain management ordinances. Increase Community Rating System rating. Mitigate Repetitive Flood Loss Properties where possible.	Planning	Administration, Public Works	General fund	L	Ongoing	✓	✓	✓	✓	✓	✓	✓	
Flood #2	Work with the MWVCOG GIS staff to develop and maintain GIS mapped critical facility inventory, repetitive loss properties, and priority residential and commercial buildings within 100-year and 500-year floodplains.	Planning	Public Works, FEMA, DOGAMI, DLCD	General fund, HMA	L	Short	✓		✓	✓		✓	✓	
Flood #3	Request DOGAMI debris flow data be included in FIRM updates. Use the updated FIRMS for land use and mitigation planning.	Planning	Public Works, FEMA, DOGAMI, DLCD	General fund, HMA	M	Medium	✓		✓	✓		✓	✓	
Flood #4	Improve sewer lagoon overflow protection from heavy rain	Public Works	Planning	General fund, utility fees	H	Short	✓		✓	✓		✓	✓	
Flood #5	Replace or retrofit force mains to protect river from wastewater spillage	Public Works	Planning, Administration	Stormwater utility fees, SRF	L	Short	✓		✓	✓		✓	✓	
Flood #6	Develop and maintain an inventory of locations subject to frequent storm water flooding based on most current USACE/FEMA flood data.	Planning	Administration, Public Works, Fire District, Police, School District	General fund, HMA	L	Short			✓	✓		✓	✓	

Natural Hazard Action ID	Action Item	Coordinating Organization (Lead)	Partners	Potential Funding	Cost	Timing	Plan Goals Addressed							
							Goal 1	Goal 2	Goal 3	Goal 4	Goal 5	Goal 6	Goal 7	Goal 8
Flood #7	Upgrade protection to sewer pump stations, sewer plant and sewer plant emergency generators.	Public Works	Administration	General fund, HMA	H	Short	✓		✓	✓		✓		✓
Flood #8	Construct concrete wing walls at culvert or bridge entrances and outlets to direct water flow into their openings	Public Works	Administration	General fund, HMA	H	Long	✓		✓	✓		✓		✓
Flood #9	Modify existing culverts by developing a ring compression, by flattening, or beveling the end of a circular culvert to match the angle of the embankment. May need to install flanges to stiffen the beveled section of the culvert.	Public Works	Administration	General fund, HMA	M	Long	✓		✓	✓		✓		✓
Flood #10	Create relief drainage ditch opening using a culvert, bridge, or multiple culverts; to relieve rapid water accumulation during high water flow events.	Public Works	Administration	General fund, HMA	H	Long	✓		✓	✓		✓		✓
Flood #11	Install debris cribs over culvert inlets to prevent inflow of coarse bed-load and light floating debris.	Public Works	Administration	General fund, HMA	M	Long	✓		✓	✓		✓		✓
Flood #12	Construct a high-water overflow crossing to carry flood flows from over bank areas.	Public Works	Administration	General fund, HMA	H	Long	✓		✓	✓		✓		✓

Natural Hazard Action ID	Action Item	Coordinating Organization (Lead)	Partners	Potential Funding	Cost	Timing	Plan Goals Addressed							
							Goal 1	Goal 2	Goal 3	Goal 4	Goal 5	Goal 6	Goal 7	Goal 8
Landslide Actions														
Landslide #1	Utilize technology, geologic resources and other available data (such as DOGAMI LIDAR data) to identify and map potential areas for landslides - high, moderate and low. Identify threatened critical facilities and other buildings and infrastructure.	Planning	DOGAMI, Public Works, Engineering	General fund, utility fees, grants	L	Medium	✓	✓	✓		✓		✓	
Landslide #2	Update the storm drainage master plan to include regulations to control runoff, both for flood reduction and to minimize saturated soils on steep slopes that can cause landslides.	Public Works	DOGAMI, Planning, Engineering	General fund, utility fees, grants	L	Short		✓		✓	✓	✓	✓	
Landslide #3	Develop, implement and enforce property development landslide risk assessment procedures to identify potential facility vulnerability.	Planning	DOGAMI, Public Works, Engineering	General fund, utility fees, grants	M	Medium	✓	✓	✓		✓		✓	
Severe Weather Actions (Windstorm and Winter Storms – Snow/Ice)														
Severe Weather #1	Develop and implement programs to coordinate maintenance and mitigation activities to reduce risk to public infrastructure from severe winter storms.	Public Works	Planning, Administration	General fund, Utility fees	M	Ongoing		✓	✓	✓		✓	✓	
Severe Weather #2	Develop, implement, and maintain partnership program with electrical utilities to use underground utility placement methods where possible to reduce or eliminate power outages from severe storms. Consider developing incentive programs.	Public Works	Planning, Utilities, property owners	General funds, utility fees, grants	H	Medium		✓	✓	✓		✓	✓	

Natural Hazard Action ID	Action Item	Coordinating Organization (Lead)	Partners	Potential Funding	Cost	Timing	Plan Goals Addressed							
							Goal 1	Goal 2	Goal 3	Goal 4	Goal 5	Goal 6	Goal 7	Goal 8
Severe Weather #3	Implement tree clearing mitigation programs to keep trees from threatening lives, property, and public infrastructure from severe weather events.	Public Works	Planning, Utilities, property owners	General funds, utility fees, grants	M	Ongoing		✓	✓	✓	✓	✓		✓
Volcanic Event Actions														
Volcanic Event #1	Evaluate ash impact on stormwater drainage system, utility infrastructure, transportation network, public facilities, and develop mitigation actions.	Engineering	Public works, Police, Fire District	General funds, utility fees, grants	L	Medium				✓	✓	✓		✓
Wildfire Actions														
Wildfire #1	Coordinate wildfire mitigation action items through the Yamhill County Community Wildfire Protection Plan.	Fire District	Planning	General fund, ODF, grants	M	Ongoing	✓	✓	✓	✓	✓	✓	✓	✓
Wildfire #2	Develop, implement, and enforce vegetation management codes/plans to reduce wildfire risk.	Planning, Fire District	Public Works	General fund, grants	L	Short		✓	✓	✓	✓	✓	✓	✓
Wildfire #3	Develop, adopt, and enforces burn ordinances that require burn permits, restricts campfires, and controls outdoor burning.	Planning, Fire District	Public Works	General fund, grants	L	Short		✓	✓	✓	✓	✓	✓	✓

Source: City of Sheridan steering committee, 2020.

Note: Full text of the plan goals referenced in this table is located on page SA-2.

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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, Section 2, and Volume III, Appendix C. The risk assessment process is graphically depicted in Figure SA-1. Ultimately, the goal of hazard mitigation is to reduce the area of risk, where hazards overlap vulnerable systems.

Figure SA-1 Understanding Risk



Hazard Analysis

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

Table SA-2 shows the HVA matrix for Sheridan 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 sense of hazard priorities but does not predict the occurrence of a hazard.

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

Table SA-2 Hazard Analysis Matrix

Hazard	Maximum		Total Threat Score	Hazard Rank	Hazard Tiers		
	History	Vulnerability				Threat	Probability
Flood	18	45	100	70	233	#1	Top Tier
Winter Storm	16	40	80	56	192	#2	
Earthquake - Cascadia	6	45	100	35	186	#3	
Windstorm	16	25	70	56	167	#4	Middle Tier
Drought	8	25	70	56	159	#5	
Earthquake - Crustal	6	20	60	21	107	#6	
Wildfire	6	15	50	28	99	#7	Bottom Tier
Landslide	6	20	30	21	77	#8	
Volcanic Event	4	10	30	7	51	#9	

Source: Sheridan steering committee, 2019-2020.

Table SA-3 categorizes the probability, and vulnerability scores from the hazard analysis for the City and compares the results to the assessment completed by the Yamhill County steering committee. Variations between the City, and County are noted in **bold** text within the city ratings.

Table SA-3 Probability and Vulnerability Comparison

Hazard	Sheridan		Yamhill County	
	Probability	Vulnerability	Probability	Vulnerability
Drought	High	Moderate	High	Moderate
Earthquake - Cascadia	Moderate	High	Moderate	High
Earthquake - Crustal	Low	Moderate	Low	Moderate
Flood	High	High	High	High
Landslide	Low	Moderate	High	Low
Volcanic Event	Low	Low	Low	Low
Wildfire	Moderate	Low	Low	Low
Windstorm	High	Moderate	High	Moderate
Winter Storm	High	High	High	High

Source: Sheridan and Yamhill County steering committee, 2019-2020.

Community Characteristics

Table SA-4 and the following section provides information on City specific demographics, and assets. 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. Between 2012 and 2019 the City grew by 25 people (< 1%).² According to the State's official coordinated population forecast, between 2019 and 2040 the City's population is forecast to grow by 13% to 7,016.³ *Note: the State is currently updating the official forecast and the proposed 2040 population is 7,008 which represents a 13% increase from 2019 population.*⁴ Median household income increased by 5% between 2012 and 2017.⁵

New development has complied with the standards of the [Oregon Building Code](#), and the city's development code including their floodplain ordinance.

Economy

The economy of Sheridan is largely related to agriculture, timber, and supporting services. Sheridan includes industrial and commercial development but is zoned primarily residential. Most commercial activity is located on Main St while industrial land including lumber and plywood mills are located along the city's western edge. Sheridan's commercial areas developed along primary routes, and residential development followed nearby (see Figure SA-2).

Most workers residing in the city (94%, ,035 people) travel outside of the city for work primarily to McMinnville, Grande Ronde, Portland Metro area, Salem, and Willamina.⁶ Most of the city's workforce travels to the city (81% of the workforce, 548 people) primarily from the surrounding unincorporated area, McMinnville, and Willamina.

Sheridan residents are employed in a variety of occupations including office and administrative support (15%), professional (13%), production (8%), food preparation and serving (10%), and personal care and service (9%) occupations.⁷

The largest employers in the city are Forest River Manufacturing, Federal Correctional Institution, and Sheridan School District.

² Portland State University, Population Research Center, "Annual Population Estimates", 2019.

³ Portland State University, Population Research Center, "Oregon Population Forecast Program Cycle 1 (2014-2017)". 2017.

⁴ Portland State University, Population Research Center, "Oregon Population Forecast Program Cycle 2 (2018-2020)". 2020 (proposed).

⁵ Social Explorer, Table T57, U.S. Census Bureau, 2013-2017 and 2008-2012 American Community Survey Estimates.

⁶ U.S. Census Bureau. LEHD Origin-Destination Employment Statistics (2002-2017). Longitudinal-Employer Household Dynamics Program, accessed on April 25, 2020 at <https://onthemap.ces.census.gov>.

⁷ Social Explorer, Table A17008, U.S. Census Bureau, 2013-2017 American Community Survey Estimates.

Table SA-4 Community Characteristics

Population Characteristics		
2012 Population	6,180	
2019 Population	6,205	
2040 Forecasted Pop. [Proposed]*	7,016 [7,008]	
Race (non-hispanic) and Ethnicity (Hispanic)		
White	71%	
Black/ African American	6%	
American Indian and Alaska Native	2%	
Asian	2%	
Native Hawaiian and Other Pacific Islander	1%	
Some Other Race	0%	
Two or More Races	4%	
Hispanic or Latino	14%	
Limited or No English Spoken	187	3%
Vulnerable Age Groups		
Less than 15 Years	839	14%
65 Years and Over	632	10%
Disability Status		
Total Population	851	20%
Children	60	6%
Seniors	252	44%
Income Characteristics		
Households by Income Category		
Less than \$15,000	210	13%
\$15,000-\$29,999	267	17%
\$30,000-\$44,999	261	17%
\$45,000-\$59,999	242	15%
\$60,000-\$74,999	271	17%
\$75,000-\$99,999	171	11%
\$100,000-\$199,999	147	9%
\$200,000 or more	-	0%
Median Household Income	\$47,372	
Poverty Rates		
Total Population	509	12%
Children	176	17%
Seniors	102	18%
Housing Cost Burden		
Owners with Mortgage	129	14%
Renters	349	54%

Source: U.S. Census Bureau, 2013-2017 American Community Survey; Portland State University, Population Research Center, "Annual Population Estimates", 2019. Portland State University, Population Research Center, "Oregon Population Forecast Program Cycle 1 (2014-2017)". 2017. and "Oregon Population Forecast Program Cycle 2 (2018-2020)". 2020 (proposed).

Housing Characteristics		
Housing Units		
Single-Family	1,249	72%
Multi-Family	396	23%
Mobile Homes	85	5%
Year Structure Built		
Pre-1970	584	34%
1970-1989	440	25%
1990-2009	706	41%
2010 or later	0	0%
Housing Tenure and Vacancy		
Owner-occupied	926	54%
Renter-occupied	643	37%
Seasonal	0	0%
Vacant	161	9%

The City of Sheridan is located along the southern boundary of Yamhill County along West Valley Highway (OR 18 business) and the Salmon River Highway (OR 18). The South Yamhill River is the primary drainage basin within the city.

Sheridan is primarily flat with hills in, and adjacent to, the northeast section of the city. Soils in Sheridan are generally poorly drained silty clay loams and clays. The area is largely agricultural with forested hills to the northeast, uncultivated vegetation consists of grass, shrubs, and scattered Oak and Douglas Fir.

Sheridan's temperatures range from a monthly average low of 34-39°F in the winter months to average highs of 74-83°F in the summer months. The coolest months are December-February and the warmest months are July and August. The average annual precipitation is about 47 inches and approximately 74% falls between November and March.

The City has an educated population with 86% of residents 25 years, and older holding a high school degree and 9% have a bachelor's degree or higher (below the county average of 25%).

Community Assets

This section outlines the resources, facilities, and infrastructure that, if damaged, could significantly impact the public safety, economic conditions, and environmental integrity of Sheridan.

Critical facilities and infrastructure are those that support government and first responders' ability to act in an emergency. They are a top priority in any comprehensive hazard mitigation plan. These include locally designated shelters and other essential assets, such as fire stations, and water and wastewater treatment facilities (see Table SA-5). **Essential facilities and infrastructure** are those that support the continued delivery of key government services, and/or that may significantly impact the public's ability to recover from the emergency. These facilities may include: City buildings and other public facilities such as schools.

It is important to note that the facilities identified as "critical" and "essential" are characterized differently than the structural code that identifies buildings as "essential" and "non-essential." The structural code uses different language and criteria and therefore have completely different meanings than the buildings identified in this addendum.

Table SA-5 Critical and Essential Facilities

Facility Name	Address	
Government		
<i>See Table SA-6 for information on seismic vulnerability.</i>		
City Hall/Sheriff's Office	120 SW Mill St	Critical
Water Supply and Treatment (not in City)	½ mile North of City on NW Evans St.	Critical
Public Works	358 NW Washington St	Critical
Waste Treatment Plant	957 Sheridan Rd	Critical
US Post Office	148 SE Harney St	Essential
Emergency Response		
Fire District Station	230 SW Mill St	Critical
Sheriff's Office (City Hall)	120 SW Mill St	Critical
Corrections		
Federal Correctional Institution	27072 Ballston Rd	Critical
Educational (Public)		
School District Office	435 S Bridge St	Essential
Faulconer-Chapman School	332 SW Cornwall St	Essential
Sheridan High School	433 S Bridge St	Essential
Educational (Charter)		
Sheridan Japanese School	430 SW Monroe St	Essential
Allprep Academy (virtual school)	339 NW Sherman Rd	Essential
Community Assets		
Public Library	142 NW Yamhill St	

Transportation/Infrastructure

Mobility plays an important role in Sheridan, and the daily experience of its residents, and businesses. Motor vehicles represent the dominant mode of travel through, and within Sheridan. Sheridan is served by Yamhill County Transit (route 24S connects Sheridan to Grande Ronde to the southwest and McMinnville to the northeast).

Infrastructure that provides critical and essential services include:

Railroads

Railroads are major providers of regional and national cargo and trade flows. Railroads run through the Northern Willamette region provide vital transportation links from the Pacific to the rest of the country. The Portland & Western (PNWR) provides freight service to/from the city. There is no passenger rail service in the city.

Rails are sensitive to icing from the winter storms that can occur in the Northern Willamette region. For industries in the region that utilize rail transport, these disruptions in service can result in economic losses. The potential for rail accidents caused by natural hazards can also have serious implications for the local communities if hazardous materials are involved.

Airports

The city has no commercial service airports, however Portland International Airport (PDX), the largest and busiest airport in the state, is in nearby Multnomah County. The closest municipal airport is in McMinnville.

Roads/Seismic lifelines

The Willamina-Sheridan Highway/Main St (OR 18 - Business) is the major east-west transportation route through the city. The Salmon River Highway (OR-18) that travels through the southern section of the city, Blair St, Bridge St, Mill St, Rock St, and Sheridan Rd are other major routes in the city (see Figure SA-2).

Seismic lifeline routes help maintain transportation facilities for public safety and resilience in the case of natural disasters. Following a major earthquake, it is important for response and recovery agencies to know which roadways are most prepared for a major seismic event. The Oregon Department of Transportation has identified lifeline routes to provide a secure lifeline network of streets, highways, and bridges to facilitate emergency services response after a disaster.⁸

System connectivity and key geographical features were used to identify a three-tiered seismic lifeline system. Routes identified as Tier 1 are considered the most significant and necessary to ensure a functioning statewide transportation network. The Tier 2 system provides additional connectivity to the Tier 1 system, it allows for direct access to more locations and increased traffic volume capacity. The Tier 3 lifeline routes provide additional connectivity to the systems provided by Tiers 1 and 2.

The Lifeline Routes in Sheridan:

⁸ Oregon Department of Transportation. Oregon Seismic Lifeline Evaluation Vulnerability Synthese Identification, *Oregon Seismic Lifeline Routes*, May 15 2012. Page 6-4 figure 6-1. Accessed September 12, 2019.

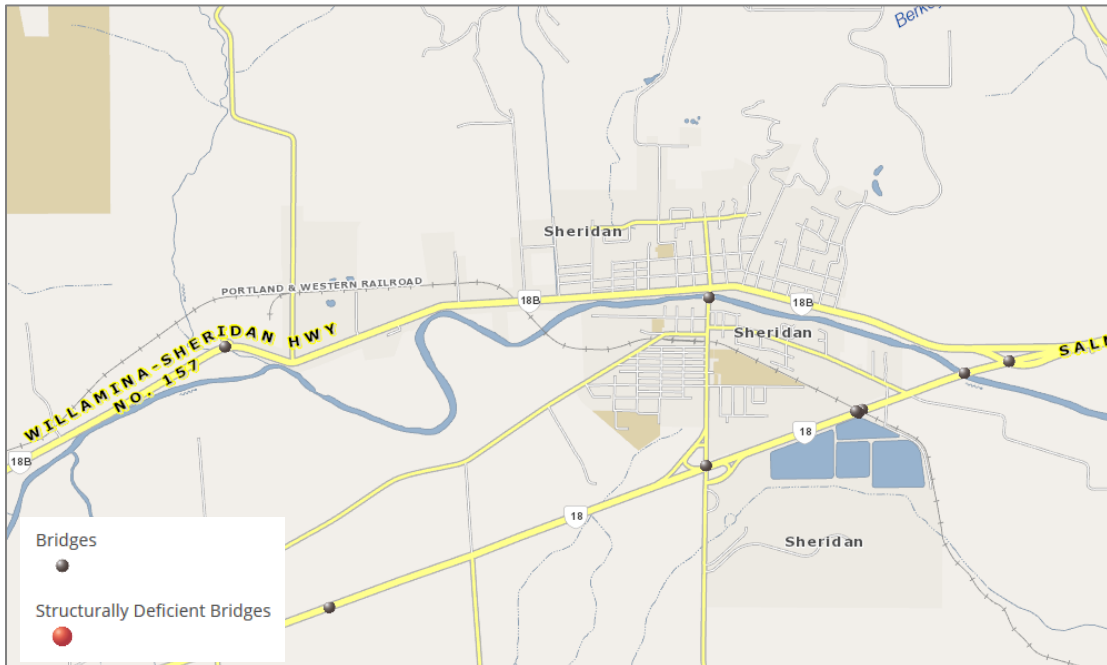
- Tier I: OR-18
- Tier II: None
- Tier III: None

Bridges

Because of earthquake risk, the seismic vulnerability of the county’s bridges is an important issue. Non-functional bridges can disrupt emergency operations, sever lifelines, and disrupt local and freight traffic. These disruptions may exacerbate local economic losses if industries are unable to transport goods. Bridges within the city that are critical or essential include:

- Yamhill River, Bridge St (ODOT 02557) (seismic retrofit ca. 2016, County owned)
- County Rd to Sheridan over Hwy 39 (OR 18)(ODOT 08062)
- Rock Creek, Hwy 157 (OR 18 business) (ODOT 00662A)
- South Yamhill River, Hwy 30 at MP 33.64 (ODOT 08063)

Figure SA-3 Oregon Bridges and Structurally Deficient Bridges



Source: Oregon Department of Transportation, ODOT TransGIS, accessed May 3, 2020

Utility Lifelines

Utility lifelines are the resources that the public relies on daily such as, electricity, fuel and communication lines. If these lines fail or are disrupted, the essential functions of the community can become severely impaired. Utility lifelines are closely related to physical infrastructures, like dams and power plants, as they transmit the power generated from these facilities.

Generally, the network of electricity transmission lines running throughout the city is operated by Portland General Electric.⁹ The Williams Gas Pipeline provides natural gas that

⁹ Allan, Stuart et. al., Atlas of Oregon. Pg. 102.

is delivered to customers in the city by Northwest Natural Gas. These lines may be vulnerable as infrequent natural hazards, like earthquakes, could disrupt service to natural gas consumers across the region.

The city water and wastewater systems include the following:

- Stoney Mountain Reservoir (9 miles north of City near Stoney Mountain)
- Water Treatment Plant (1/4 Mile north of the city on NW Evans St)
- Reservoir 1 (0.25 MG) (1/4 Mile north of the city on NW Evans St)
- Reservoir 2 (0.50 MG) (1/4 Mile north of the city on NW Evans St)
- Reservoir 3 (1.85 MG) (1/4 Mile north of the city on NW Evans St)
- Reservoir 4 (1.50 MG) and Ballston Pump Station (26525 SE Ballston Rd)
- Bridge Street water intake structure (near 102 E Main St)
- About 10 miles of water transmission lines
- About 17 miles of water distribution lines
- Wastewater Lagoons (23725 Schatz Rd)
- About 15 miles of sewer lines
- Wastewater Chlorinator Building (23725 Schatz Rd)
- Main Lift Station (957 Sheridan Rd) – seismic retrofit and flood elevation (ca. 2018; \$1.9 million)
- West Main Lift Station (1200 West Main St)

Environmental Assets/Parks:

Environmental assets are those parks, green spaces, wetlands, and rivers that provide an aesthetic, and functional ecosystem services for the community include: Sheridan City Park, Edward R Moore Park, Masonic cemetery, and Greencrest Memorial Park (cemetery).

Vulnerable Populations:

Vulnerable populations, including seniors, disabled citizens, women, and children, as well as 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:

Child Care Facilities

Adventist Beginning Daycare

Adult Care Facilities

River Place Senior Living
Sheridan Care Center

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 Sheridan 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. The following historic resources can be found in the City of Sheridan:

Travelers Home (147 NE Yamhill St)
William Shipley House (31100 W Valley Hwy)
Walter Sleppy House (236 SW Water)

Hazard Characteristics

Drought

The steering committee determined that the City's probability for drought is **high**, and that their vulnerability to drought is **moderate**.

Volume I, Section 2 describes the characteristics of drought hazards, history, as well as the location, extent, and probability of a potential event. Due to the climate of Yamhill County, past, and present weather conditions have shown an increasing potential for drought.

The City's primary water source is from Stoney Mountain Reservoir (60-million-gallon capacity) and is fed water from six (6) nearby springs. Water from the reservoir is gravity fed to the city's three (3) of the city's four (4) water storage reservoirs (4.08 MG) located 8 miles away next to the water treatment plant. During high demand surface water is used from the South Yamhill River, stored in the Ballston Reservoir, pumped to the water treatment plant, where it is mixed and stored with the spring sources. To meet future demand it is expected that the city will need improvements to the distribution piping, addition of two upper level pressure zones, and additional storage reservoirs and pump stations. Per the 2007 Water System Master Plan capital improvements to the distribution piping is recommended for (2006 to 2010), and to storage, pumping, and distribution piping in the years (2010 to 2025+).

Vulnerability Assessment

Due to insufficient data and resources, Sheridan is currently unable to perform a quantitative risk assessment, or exposure analysis, for this hazard. State-wide 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 apply to humans and resources. Industries important to the City of Sheridan's local economy such as agriculture, and timber have historically been affected, and any future droughts would have tangible economic and potentially human impacts.

Mitigation Activities

The City engages in water conservation measures including water line leak detection and repair, replacement of deteriorating pipe, and replacement/repair of older and under-registering water meters and reducing dead end lines in order to increase water circulation throughout the system.

Sheridan Codes Pertaining to Droughts

The following Sheridan codes, plans, and policies pertain to droughts:

1. Sheridan Comprehensive Plan, "Water Resources" and "Natural Hazards".
2. Sheridan Development Code Chapter 13.08 *Water Emergencies*.

3. Sheridan provides water conservation tips to residents that include voluntary measures individuals and households can take to increase conservation of water during times of low water availability.

Please review Volume I, Section 2 for additional information on this hazard.

Earthquake (Cascadia Subduction Zone)

The steering committee determined that the City's probability for a Cascadia Subduction Zone (CSZ) earthquake is **moderate** and that their vulnerability to a CSZ earthquake is **high**.

Volume I, Section 2 describes the characteristics of earthquake hazards, history, as well as the location, extent, and probability of a potential event. Generally, an event that affects the County is likely to affect Sheridan as well. The causes, and characteristics of an earthquake event are appropriately described within the 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 Sheridan as well.

Within the Northern Willamette Valley are that includes Yamhill County, two potential faults and/or zones can generate high-magnitude earthquakes. These include the Cascadia Subduction Zone and the Gales Creek-Newberg-Mt. Angel Structural Zone (including the Newberg Fault).

Cascadia Subduction Zone

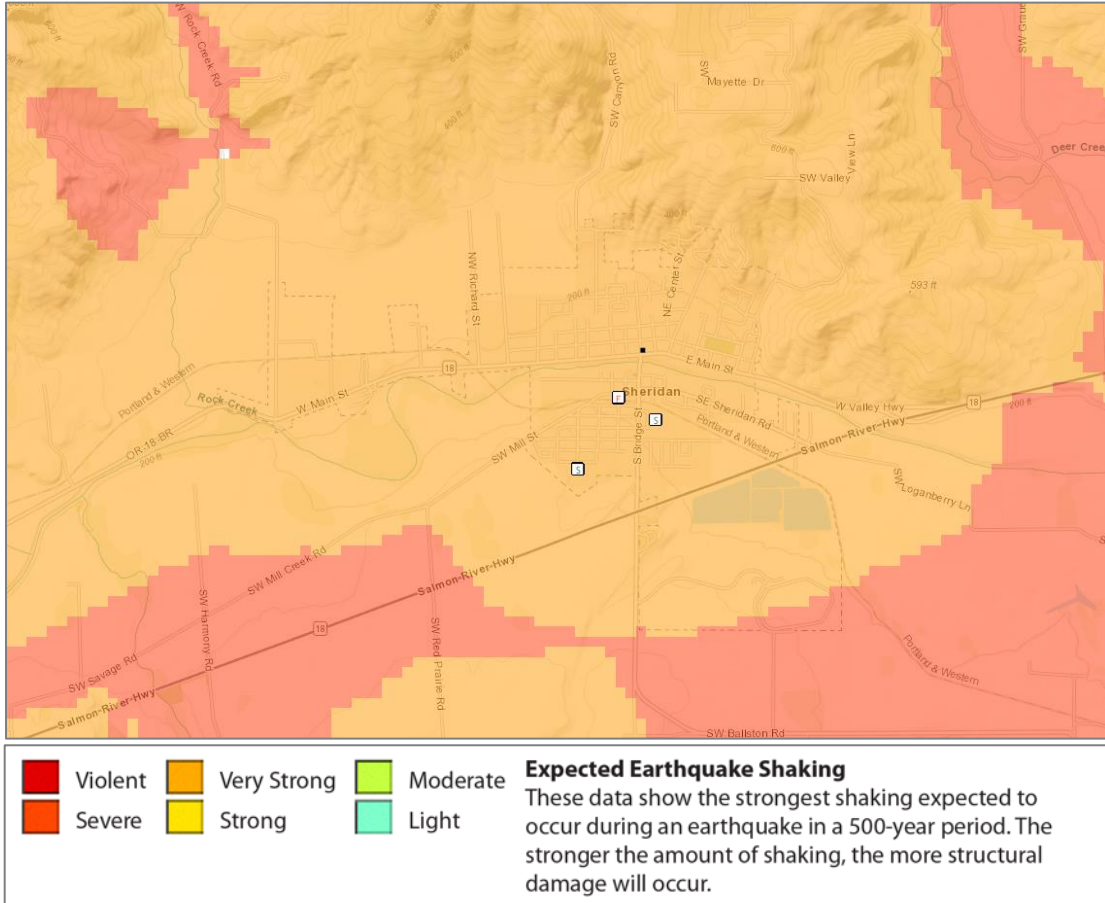
The Cascadia Subduction Zone is a 680-mile-long zone of active tectonic convergence where oceanic crust of the Juan de Fuca Plate is subducting beneath the North American continent at a rate of 4 cm per year. Scientists have found evidence that 11 large, tsunami-producing earthquakes have occurred off 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 approximately 1700 A.D.¹⁰

Figure SA-4 displays relative shaking hazards from a Cascadia Subduction Zone earthquake event. As shown in the figure, the City is expected to experience very strong (orange) shaking in a CSZ event.

The city'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 City 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 Sheridan within the "Valley Zone" (Valley Zone, from the summit of the Coast Range to the summit of the Cascades). Within the Northwest Oregon region, 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.

¹⁰ The Cascadia Region Earthquake Workgroup, 2005. Cascadia Subduction Zone Earthquakes: A magnitude 9.0 earthquake scenario. <http://www.crew.org/PDFs/CREWSubductionZoneSmall.pdf>

Figure SA-4 Cascadia Subduction Zone Expected Shaking



Source: [Oregon HazVu: Statewide Geohazards Viewer \(DOGAMI\)](#)

Note: To view detail click the link above to access Oregon HazVu.

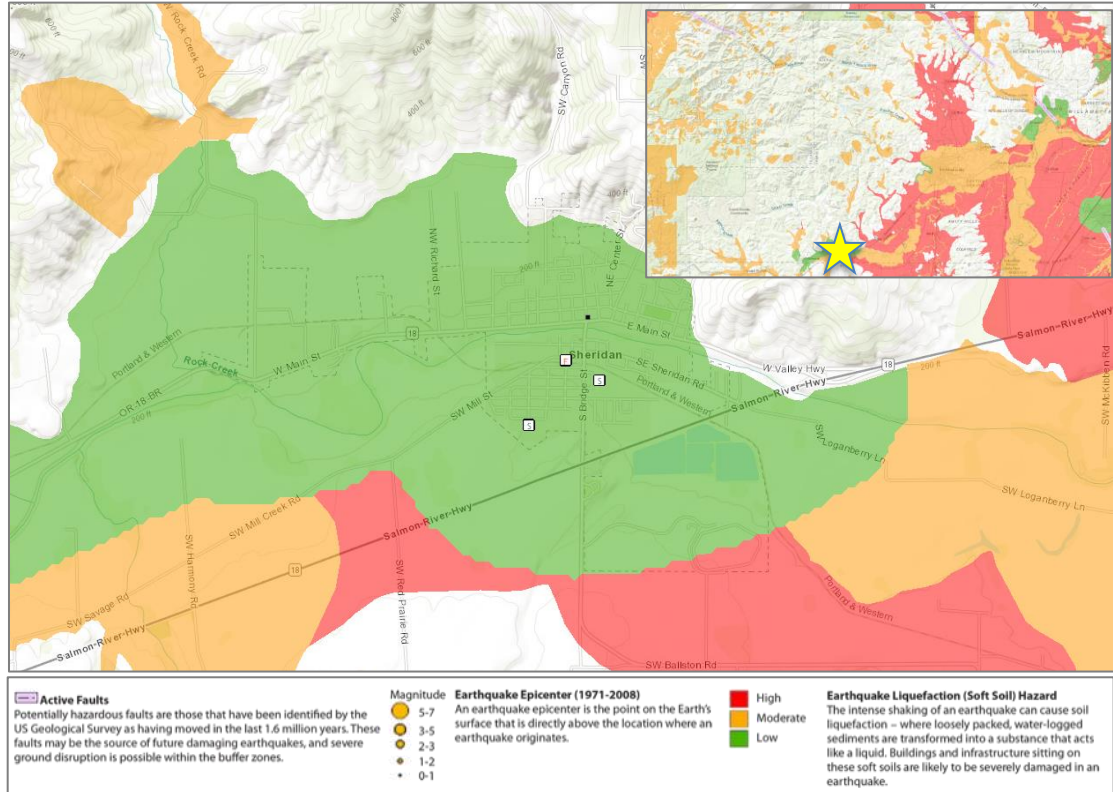
Earthquake (Crustal)

The steering committee determined that the City’s probability for a crustal earthquake is **low** and that their vulnerability to crustal earthquake is **moderate**.

Volume I, Section 2 describes the characteristics of earthquake hazards, history (see below), as well as the location, extent, and probability of a potential event. Generally, an event that affects the County is likely to affect Sheridan 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 Sheridan as well.

Figure SA-5 shows a generalized geologic map of the Sheridan area that includes the areas for potential regional active faults, earthquake history (1971-2008), and soft soils (liquefaction) hazard. The figure shows the areas of greatest concern within the City limits as red (High liquefaction hazard). The inset map shows the county including the Newberg Fault and hazard history.

Figure SA-5 Active Crustal Faults, Epicenters (1971-2008), and Soft Soils



Source: [Oregon HazVu: Statewide Geohazards Viewer \(DOGAMI\)](#)

Note: To view detail click the link above to access Oregon HazVu.

Vulnerability Assessment (subduction zone and crustal)

Due to insufficient data and resources, Sheridan is currently unable to perform a quantitative risk assessment for this hazard. The western portion of Yamhill County is likely to experience higher levels of shaking than the eastern portion, as a result of its proximity to the Cascadia Subduction Zone.

The City of Sheridan is in the south-central portion of Yamhill County, in a region likely to experience strong shaking should a subduction zone or significant crustal earthquake occur. This rating represents the peak acceleration of the ground caused by the earthquake, and for a strong designation corresponds to 9-20 percent of the acceleration of gravity. The City is also in an area prone to liquefaction (soft soils) during either a subductions zone or crustal earthquake event. Sheridan is located more distant from crustal earthquake faults (the closest are the Newberg and Mount Angel faults approximately 25-3 miles to the east) and has not experienced a damaging earthquake.

Ground movement is likely to cause damage to weak, unreinforced masonry buildings, and to induce small landslides along unstable slopes. As well as landslide, earthquakes can trigger other hazards such as dam failure and disruption of transportation and utility systems.

Utility systems will be significantly damaged, including damaged buildings, and damage to utility infrastructure, including water 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. 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.

Building codes were implemented in Oregon in the 1970s, however, stricter standards did not take effect until 1991 and early 2000s. As noted in the community characteristics section (Table SA-4), approximately 59% of residential buildings were built prior to 1990, which increases the City’s vulnerability to the earthquake hazard. Information on specific public buildings’ (schools and public safety) estimated seismic resistance, determined by DOGAMI in 2007, is shown in Table SA-6; each “X” represents one building within that ranking category. Of the facilities evaluated by DOGAMI using their Rapid Visual Survey (RVS), none have a very high (100% chance) collapse potential, and one building, at Sheridan High School, has a high (greater than 10% chance) collapse potential.

Table SA-6 Rapid Visual Survey Scores

Facility	Site ID*	Level of Collapse Potential			
		Low (<1%)	Moderate (>1%)	High (>10%)	Very High (100%)
Schools					
Faulconer-Chapman School (332 SW Cornwall St)	Yamh_sch16	X			
Sheridan High (433 S Bridge St)	Yamh_sch17			X	
Public Safety					
Sheridan Fire District (230 SW Mill St)	Yamh_fir03		SRGP 2017-19, Phase I (\$2,092,758)		
Sheriff’s Office/City Hall (120 SW Mill St)	Yamh_pol07		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 Yamhill County Map](#)

Mitigation Activities

Earthquake mitigation activities listed here include current mitigation programs and activities that are being implemented by Sheridan agencies or organizations.

A primary mitigation objective is to construct or upgrade critical and essential facilities and infrastructure to withstand future earthquake events. Seismic retrofit grant awards per the [Seismic Rehabilitation Grant Program](#)¹¹ have been funded to retrofit the Sheridan Fire Station (2017-19, Phase I, grant award, \$2,092,758), to be completed in 2021.

¹¹ 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.

Sheridan Codes Pertaining to Earthquakes

The following Sheridan codes, plans, and policies pertain to earthquakes:

1. Sheridan Comprehensive Plan, “Natural Hazards”.
2. The City of Sheridan enforces the [Oregon Building Code](#) which includes provisions for earthquakes.

Please review Volume I, Section 2 for additional information on this hazard.

Flood

The steering committee determined that the City’s probability for flood is **high** and that their vulnerability to flood is **high**.

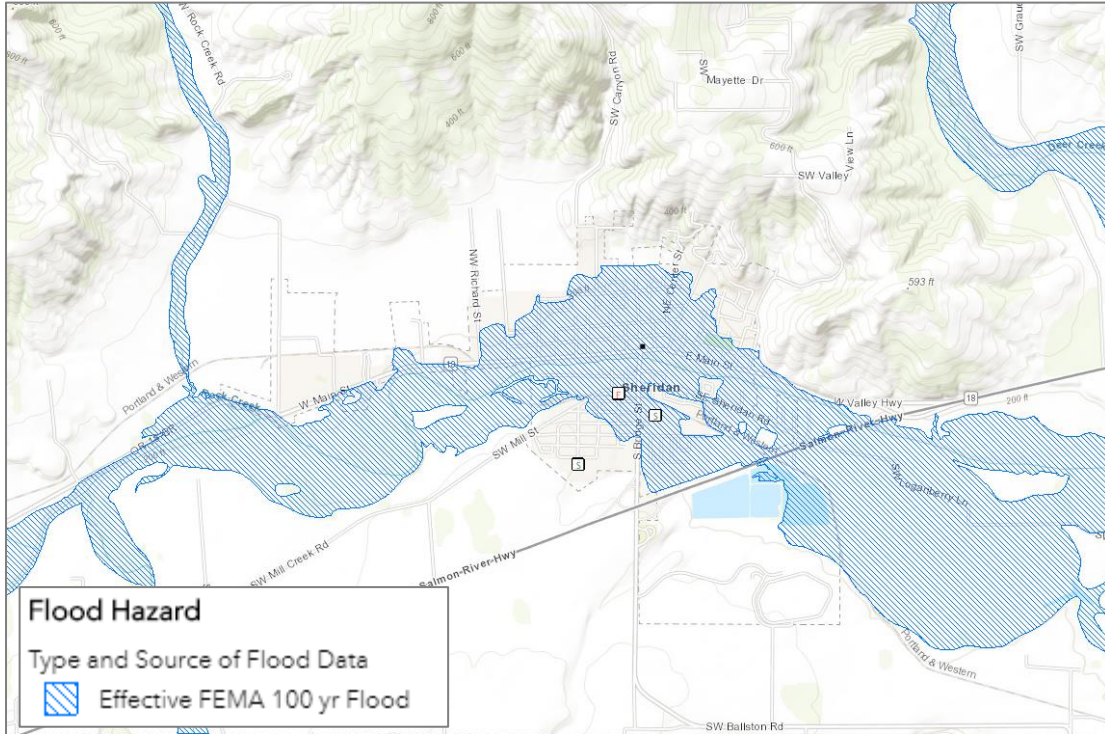
Volume I, Section 2 describes the characteristics of flood hazards, history, as well as the location, extent, and probability of a potential event. The City is essentially built around the South Yamhill River. Adjacent land is relatively flat and does not provide flood protection. Floods in Sheridan are immediate and widespread once the riverbanks overflow. Future floods are expected to be like previous floods. The flood of record is the December 22, 1964 flood (other major floods include 196, 1996, and 2007). About 75% of Sheridan has areas of floodplains (special flood hazard areas, SFHA). These include lowland areas north and south of the South Yamhill River (Figure SA-6).

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 Sheridan 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.

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. Business owners, and their employees are significantly impacted by flood events. Direct damages from flooding are the most common impacts, but indirect damages, such as diminished clientele, can be just as debilitating to a business.

Figure SA-6 Special Flood Hazard Area



Source: [Oregon HazVu: Statewide Geohazards Viewer \(DOGAMI\)](#)

Note: To view detail click the link above to access Oregon HazVu.

Vulnerability Assessment

Due to insufficient data and resources, Sheridan is currently unable to perform a quantitative risk assessment for this hazard. FEMA FIRMs were used to outline the 100-year and 500-year floodplains for the City of Sheridan. The 100-year floodplain delineates an area of high risk, while the 500-year floodplain delineates an area of moderate risk. About 75% of the city is impacted by the SFHA including Residential, Commercial, and Industrial development. The city's sewage lagoons are in an area susceptible to flooding from the South Yamhill River.

The City of Sheridan's Stoney Mountain Reservoir Dam is located approximately 9 miles north of the city. A catastrophic failure of the dam is not expected to present a threat to human life downstream. Additionally, roads and residential structures are unlikely to be impacted by any flooding from the dam.

National Flood Insurance Program (NFIP)

FEMA's Flood Insurance Study (FIS), and Flood Insurance Rate Maps (FIRMs) are effective as of March 2, 2010. Table SA-7 shows that as of August 2019, Sheridan has 298 National Flood Insurance Program (NFIP) policies in force. Of those, 104 are for properties that were constructed before the initial FIRMs. The last Community Assistance Visit (CAV) for Sheridan was on February 19th, 2015. Sheridan has a Community Rating System (CRS) rating of 9. The table shows that all but 17 flood insurance policies are for residential structures, primarily single-family homes. There have been 46 paid flood insurance claims for a total of \$761,309. The City complies with the NFIP through enforcement of their flood damage prevention ordinance and their floodplain management program.

Table SA-7 Flood Insurance Detail

	Yamhill County	Sheridan
Effective FIRM and FIS	3/2/2010	3/2/2010
Initial FIRM Date	-	8/1/1980
Total Policies	446	298
Pre-FIRM Policies	153	104
Policies by Building Type		
Single Family	401	258
2 to 4 Family	14	13
Other Residential	10	10
Non-Residential	21	17
Minus Rated A Zone	72	64
Insurance in Force	\$100,617,300	\$62,163,000
Total Paid Claims	81	46
Pre-FIRM Claims Paid	68	43
Substantial Damage Claims	3	3
Total Paid Amount	\$1,166,076	\$761,309
Repetitive Loss Structures	4	1
Severe Repetitive Loss Properties	1	0
CRS Class Rating	-	8*
Last Community Assistance Visit	-	Ongoing

Source: Information compiled by Department of Land Conservation, and Development, August 2019. Repetitive Flood Loss information provided by FEMA correspondence on September 10, 2020. Note: *As of August 24, 2020 the city has an ongoing CAV, the city expects to have a CRS Class Rating change from the current rating of 9 to an 8.

The Community Repetitive Loss record for Sheridan identifies one (1) Repetitive Loss Property¹² (RL) and no Severe Repetitive Loss Properties¹³ (SRL). The RL property is a single-family residence located on Railroad Street that flooded in 1998 and 2004. In 1998, the house was the only house to flood while in 2004 several other houses were impacted by flood. The city has an active storm drain maintenance program that appears to have decreased flood risk in this area.

Mitigation Activities

Flood mitigation activities listed here include current mitigation programs and activities that are being implemented by Sheridan agencies or organizations.

¹² 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.

¹³ 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.

Sheridan Codes Pertaining to Flooding

The following Sheridan codes, plans, and policies pertain to flooding:

1. Sheridan Comprehensive Plan, “Natural Hazards” and “Flood Plains”.
2. Sheridan Development Code Section 16.280 *Flood Plain Overlay District*. This portion of the Community Development Code implements the Goal 7 policies of the Comprehensive Plan and regulates development within the floodplain.
3. The city has a [Storm Drainage Master Plan](#) (2009) and maintains storm drains to decrease flood risk.
4. The city provides information to residents and property owners regarding the risk of flood, safety, mitigation, and preparation.

Please review Volume I, Section 2 for additional information on this hazard.

Landslide

The steering committee determined that the City’s probability for landslide is **low** and that their vulnerability to landslide is **moderate**.

Volume I, Section 2 describes the characteristics of landslide hazards, history, as well as the location, extent, and probability of a potential event within the region.

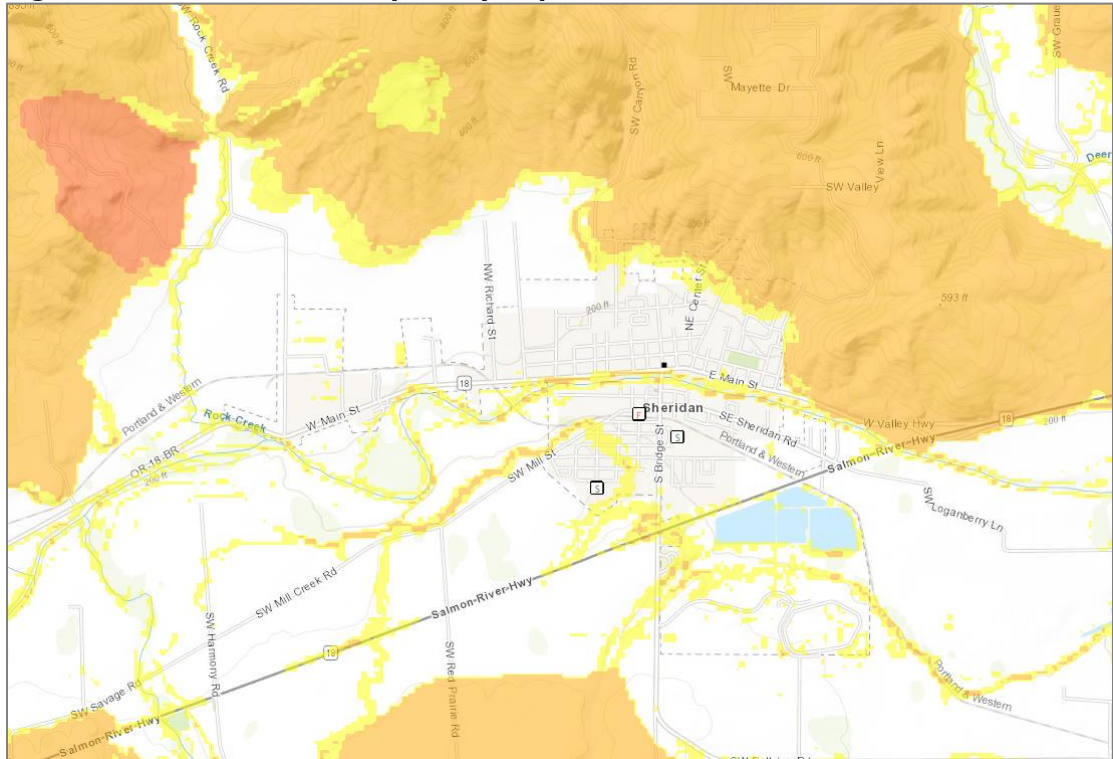
Landslide susceptibility exposure for Sheridan is shown in Figure SA-7. Approximately 6% of Sheridan has very high or high, and approximately 14% moderate, landslide susceptibility exposure.¹⁴ Within the City areas of higher landslide risk tend to be located adjacent to the South Yamhill River and indicate erosion potential. In general, the areas of greater risk are located outside of the city to the north. *Note that even if a jurisdiction has a high percentage of area in a high or very high landslide exposure susceptibility zone, this does not mean there is a high risk, because risk is the intersection of hazard, and assets.*

Potential landslide-related impacts are adequately described within Volume I, Section 2, and include infrastructure 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 occur during any winter, and thoroughfares beyond City limits are susceptible to obstruction as well.

The most common type of landslides 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.

¹⁴ DOGAMI. [Open-File Report, O-16-02](#), *Landslide Susceptibility Overview Map of Oregon* (2016)

Figure SA-7 Landslide Susceptibility Exposure



Low	Landsliding unlikely. Areas classified as Landslide Density = Low (less than 7%) and areas classified as Slopes Prone to Landsliding = Low.
Moderate	Landsliding possible. Areas classified as Landslide Density = Low to Moderate (less than 17%) and areas classified as Slopes Prone to Landsliding = Moderate OR areas classified as Landslide Density = Moderate (7%-17%) and areas classified as Slopes Prone to Landsliding = Low.
High	Landsliding likely. Areas classified as Landslide Density = High (greater than 17%) and areas classified as Slopes Prone to Landsliding = Low and Moderate OR areas classified as Landslide Density = Low and Moderate (less than 17%) and areas classified as Slopes Prone to Landsliding = High.
Very High	Existing landslides Landslide Density and Slopes Prone to Landsliding data were not considered in this category. Note: the quality of landslide inventory (existing landslides) mapping varies across the state.

Source: [Oregon HazVu: Statewide Geohazards Viewer \(DOGAMI\)](#)

Note: To view detail click the link above to access Oregon HazVu

Vulnerability Assessment

Due to insufficient data and resources, Sheridan is currently unable to perform a quantitative risk assessment for this hazard. DOGAMI completed a statewide landslide susceptibility assessment in 2016 ([O-16-02](#)), general findings from that report are provided above and within Figure SA-7. Response and recovery efforts will likely vary from minor cleanup to more extensive utility system rebuilding. Utility disruptions are usually local and terrain dependent. Damages may require reestablishing electrical, communication, and gas pipeline connections occurring from specific breakage points. Previous wet weather has led to saturated earth causing movement on the hillside where the water plan is located. While previous events have not disrupted service there have been leaks and dislodged pipes. Initial debris clearing from emergency routes and high traffic areas may be required. Water and wastewater utilities may need treatment to quickly improve water quality by reducing excessive water turbidity and reestablishing waste disposal capability.

Mitigation Activities

Landslide mitigation activities listed here include current mitigation programs and activities that are being implemented by the City of Sheridan agencies or organizations.

City of Sheridan Codes Pertaining to Landslides

The following Sheridan codes, plans, and policies pertain to landslides:

1. Sheridan Comprehensive Plan, “Natural Hazards” and “Steep Slopes”.
2. Sheridan Development Code Section 16.290 *Hillside Development Overlay District*.
3. The City of Sheridan enforces the [Oregon Building Code](#) which includes provisions that address the potential of geologic hazards including landslides.

Please review Volume I, Section 2 for additional information on this hazard.

Severe Weather

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

Windstorm

The steering committee determined that the City’s probability for windstorm is **high** and that their vulnerability to windstorm is **moderate**.

Volume I, Section 2 describes the characteristics of windstorm hazards, history, 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 flooding and winter storms (ice, freezing rain, and very rarely, snow). Other severe weather events that may accompany windstorms, including thunderstorms, hail, lightning strikes, and tornadoes are generally negligible for Sheridan.

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.

Damage from high winds generally has resulted in downed utility lines, and trees usually limited to several localized areas. 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 may cause localized urban flooding.

Please review Volume I, Section 2 for additional information on this hazard.

Winter Storm (Snow/Ice)

The steering committee determined that the City's probability for winter storm is **high** and that their vulnerability to winter storm is **high**.

Volume I, Section 2 describes the characteristics of winter storm hazards, history, 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.

Vulnerability Assessment

Due to insufficient data and resources, Sheridan is currently unable to perform a quantitative risk assessment, or exposure analysis, for the windstorm and winter storm hazards. All areas within the City of Sheridan are equally at risk of a windstorm or winter storm event.

Mitigation Activities

The City works to mitigate problems regarding windstorm and winter storm issues when they arise. Mitigation activities listed here include current mitigation programs and activities that are being implemented by Sheridan agencies or organizations.

- ODOT is responsible for sanding and de-icing state managed roads including: OR 18 within city limits.
- The City requires that all new utility lines, cables or wires, on new development be placed underground.
- The City via Yamhill County provides education on winter weather preparedness
- The City encourages property owners to trim hazard trees, and to maintain trees within public rights-of-way. Utility companies maintain trees along their utility easements.

City of Sheridan Codes Pertaining to Windstorms and Winter Storms

The following Sheridan codes, plans, and policies pertain to windstorms and winter storms:

1. The City of Sheridan Development Code provides standards for public infrastructure and utilities, including design.
2. The City of Sheridan enforces the [Oregon Building Code](#) which regulates building material requirements and includes provisions for windstorms and winter storms.

Please review Volume I, Section 2 for additional information on this hazard.

Volcanic Event

The steering committee determined that the City's probability for a volcanic event is **low** and that their vulnerability to a volcanic event is **low**.

Volume I, Section 2 describes the characteristics of volcanic hazards, history, as well as the location, extent, and probability of a potential event within the region. Generally, an event that affects the Eastern portion of the County is likely to affect Sheridan as well. Several volcanoes are located near Sheridan, the closest of which are Mount Hood, Mount Adams, Mount Saint Helens, Mount Rainier, and the Three Sisters.

Due to Sheridan'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). Although the City of Sheridan is unlikely to experience lahars or lava flows, tephra (sand- sized or finer particles of volcanic rock that is ejected rapidly into the air from volcanic vents) drifts downwind from the explosions and can form a blanket-like deposit of ash. 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 heavier coating of ash. Tephra is a public health threat, and can damage agriculture and transportation systems (i.e., aircraft and on- the-ground vehicles). Tephra can also clog drainage systems and create major debris management problems. Within Sheridan, public health would be a primary concern, and keeping transportation routes open/accessible would be important as well.

Vulnerability Assessment

Due to insufficient data and resources, Sheridan is currently unable to perform a quantitative risk assessment, or exposure analysis, for this hazard.

Mitigation Activities

The existing volcanic event hazard mitigation activities are conducted at the county, regional, state, and federal levels and are described in the Yamhill County NHMP.

City of Sheridan Codes Pertaining to Volcanic Events

The City does not have specific codes, plans, or policies that pertain to volcanic events:

Please review Volume I, Section 2 for additional information on this hazard.

Wildfire

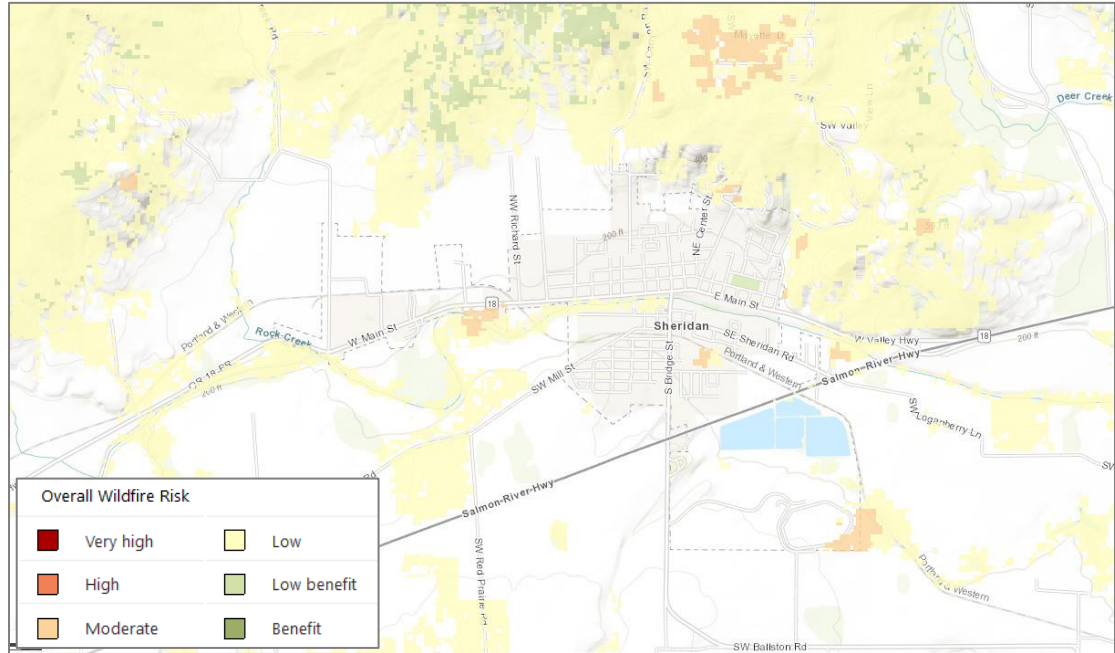
The steering committee determined that the City's probability for wildfire is **moderate** and that their vulnerability to wildfire is **low**. The City will update the City's wildfire risk assessment if the CWPP presents better data during future updates (an action item is included to participate in future updates to the CWPP).

The [Yamhill County Community Wildfire Protection Plan \(CWPP\)](#) was completed in August 2009 and revised in 2015. The CWPP is hereby incorporated into this NHMP addendum by reference, and it will serve as the wildfire section for this addendum.

Volume I, Section 2 describes the characteristics of wildland fire hazards, history, as well as the location, extent, and probability of a potential event within the region. The location, and extent of a wildland fire vary depending on fuel, topography, and weather conditions.

Weather, and urbanization conditions are primarily at cause for the hazard level. Sheridan has not experienced a wildfire within City limits. The city is surrounded by irrigated agricultural land. However, some wooded areas are a concern in the case of a wildfire event. Figure SA-8 shows overall wildfire risk in Sheridan.

Figure SA-8 Overall Wildfire Risk



Source: [Oregon Wildfire Risk Explorer](#), date accessed May 3, 2020.

There have been no wildfires in the City, however, several small wildfires have occurred west of the city in the regions near the city’s water treatment plant and Stoney Mountain Reservoir. Wildland fires can be a problem in late summer to early fall and are usually caused by human activity (illegal brush burning, etc.).

The forested areas within, and surrounding Sheridan are interface areas. These areas (outside of the city) are characterized by varying housing structures (often large houses on small lots, some with shake roofs), natural, and ornamental vegetation, and topography that may increase the risk for wildfire spreading (particularly to the north and northeast).

Most of the city has less severe (low to none) wildfire burn probability that includes expected flame lengths less than four feet under normal weather conditions.¹⁵ However, conditions vary widely and with local topography, fuels, and local weather (including wind) conditions. Under warm, dry, windy, and drought conditions expect higher likelihood of fire starts, higher intensity, more ember activity, and a more difficult to control wildfire that will include more fire effects and impacts.

¹⁵ [Oregon Wildfire Risk Explorer](#),

Vulnerability Assessment

Due to insufficient data and resources, Sheridan is currently unable to perform a quantitative risk assessment for this hazard.

The potential community impacts, and vulnerabilities described in Volume I, Section 2 are generally accurate for the City as well.

Sheridan's fire response is provided by the Sheridan Fire District. The CWPP assesses wildfire risk, maps wildland urban interface areas, and includes actions to mitigate wildfire risk (all identified actions are outside the city limits). However, several identified defensible space and NFPA 1144 projects are located near the city or within the city's watershed.

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).

Exposed infrastructure including wastewater main lines, major water lines, natural gas pipeline and fiber optic lines are buried, decreasing their vulnerability to damage from wildfire hazards. However, wildfire conditions could potentially limit or delay access for the purposes of operation or repair.

Mitigation Activities

The Sheridan Fire District works to mitigate problems regarding wildfire issues when they arise. Wildfire mitigation activities listed here include current mitigation programs and activities that are being implemented by Sheridan agencies or organizations.

City of Sheridan Codes Pertaining to Wildfires

The following Sheridan codes, plans, and policies pertain to wildfires:

1. The City of Sheridan Development Code provides standards for public infrastructure and utilities, including design.
2. The City of Sheridan enforces the [Oregon Building Code](#) which regulates building material requirements and includes provisions for fire.

Please review the [Yamhill County Community Wildfire Protection Plan \(CWPP\)](#) and [Volume I, Section 2](#) for additional information on this hazard.

ATTACHMENT A: ACTION ITEM FORMS

In the previous plan the City identified three high priority action items. These actions are those the city considered during the 2015-2020 Implementation and Maintenance period and they are listed in Table SA-8 along with their status.

Table SA-8 2015 High Priority Action Item Status

2014 Priority Action ID	Status (2020 Action ID) (Complete, Deferred, Deleted, Ongoing)	Comment	Description
Action #1	Completed	Part of NHMP planning process.	Establish a hazard mitigation planning committee
Action #2	Ongoing (Multi-hazard #2)	Description modified. In process.	MH-Cross reference and incorporate mitigation planning provisions into all community planning processes, planning, transportation plans
Action #3	Delete	Part of NHMP Implementation and Maintenance process.	Identify and pursue funding opportunities to implement mitigation processes

Table SA-1 provide a summary list of 2020 NHMP Actions for the city. Each high priority action item has a corresponding action item worksheet describing the activity, identifying the rationale for the project, identifying potential ideas for implementation, and assigning coordinating and partner organizations. The action item worksheets can assist the community in pre-packaging potential projects for grant funding. The worksheet components are described below.

ALIGNMENT WITH EXISTING PLANS/POLICIES

The City NHMP includes a range of action items that, when implemented, will reduce loss from hazard events in the City. Within the plan, FEMA requires the identification of existing programs that might be used to implement these action items. The City addresses statewide planning goals and legislative requirements through its comprehensive land use plan, capital improvements plan, mandated standards and building codes. To the extent possible, the City will work to incorporate the recommended mitigation action items into existing programs and procedures. Each action item identifies related existing plans and policies.

STATUS/RATIONALE FOR PROPOSED ACTION ITEM

Action items should be fact-based and tied directly to issues or needs identified throughout the planning process. Action items can be developed at any time during the planning process and can come from several sources, including participants in the planning process, noted deficiencies in local capability, or issues identified through the risk assessment. The

rationale for proposed action items is based on the information documented in this addendum and within Volume I, Section 2. The worksheet provides information on the activities that have occurred since the previous plan for each action item.

IDEAS FOR IMPLEMENTATION

The ideas for implementation offer a transition from theory to practice and serve as a starting point for this plan. This component of the action item is dynamic, since some ideas may prove to not be feasible, and new ideas may be added during the plan maintenance process. Ideas for implementation include such things as collaboration with relevant organizations, grant programs, tax incentives, human resources, education and outreach, research, and physical manipulation of buildings and infrastructure.

COORDINATING (LEAD) ORGANIZATION:

The coordinating organization is the public agency with the regulatory responsibility to address natural hazards, or that is willing and able to organize resources, find appropriate funding, or oversee activity implementation, monitoring and evaluation.

INTERNAL AND EXTERNAL PARTNERS:

The internal and external partner organizations listed in the Action Item Worksheets are potential partners recommended by the project steering committee but not necessarily contacted during the development of the plan. The coordinating organization should contact the identified partner organizations to see if they are capable of and interested in participation. This initial contact is also to gain a commitment of time and/or resources toward completion of the action items.

Internal partner organizations are departments within the City or other participating jurisdiction that may be able to assist in the implementation of action items by providing relevant resources to the coordinating organization.

External partner organizations can assist the coordinating organization in implementing the action items in various functions and may include local, regional, state, or federal agencies, as well as local and regional public and private sector organizations.

PLAN GOALS ADDRESSED:

The plan goals addressed by each action item are identified as a means for monitoring and evaluating how well the mitigation plan is achieving its goals, following implementation.

TIMELINE:

All broad scale action items have been determined to be ongoing, as opposed to short (0 to 2 years), medium (2-5 years), or long (6 or more years). This is because the action items are broad ideas, and although actions may be implemented to address the broad ideas, the efforts should be ongoing.

POTENTIAL FUNDING SOURCE

Where possible potential funding sources have been identified. Example funding sources may include: Federal Hazard Mitigation Assistance programs, state funding sources such as the Oregon Seismic Rehabilitation Grant Program, or local funding sources such as capital

improvement or general funds. An action item may include several potential funding sources.

ESTIMATED COST

A rough estimate of the cost for implementing each action item is included. Costs are shown in general categories showing low, medium, or high cost. The estimated cost for each category is outlined below:

Low - Less than \$50,000

Medium - \$50,000 – \$100,000

High - More than \$100,000

Multi-Hazard #1

Proposed Action Item:		Alignment with Plan Goals:	
Develop, enhance, and implement public education and information materials concerning mitigation, preparedness and safety procedures for identified natural hazards.		Gopal 1, Goal 2, Goal 3, Goal 6, Goal 8	
Alignment with Existing Plans/Policies:			
Emergency Operations Plan, Community Wildfire Protection Plan			
2020 Status/Rationale for Proposed Action Item:			
<p>The natural hazard sections of the City's addendum (Volume II) to the Yamhill Co. NHMP and Yamhill County's risk assessment (Volume I, Section 2 and Volume III, Appendix C) identify vulnerable populations and property within the various identified hazard areas. Increasing public outreach to educate residents about their risk to natural hazards affecting their community as well as what to do in the event of a natural hazard will help decrease their vulnerability to natural hazards.</p> <p>The Disaster Mitigation Act of 2000 requires communities to identify how the community will continue to involve the public in the plan maintenance process [201.6(c)(4)(iii)]. Educating landowners on how to mitigate the effects of natural hazards helps keep the public informed of what is being done with the plan, how the City is working to mitigate its risk to natural hazards, and allows for feedback and suggestions from the public for improving, updating, and maintaining the plan.</p>			
Ideas for Implementation:			
<p>Distribution of natural hazard information describing dangers and evacuation routes for visitors to Sheridan and continued educational outreach for residents and business owners.</p> <p>Update brochures with new information provided as part of reports provided by DOGAMI, ODF, DLCD, and FEMA (among others).</p> <p>Identify and use existing mechanisms for public outreach (e.g., SWCD, NRCS, watershed councils, OSU Extension, etc.).</p>			
Coordinating Organization:		Planning	
Internal Partners:		External Partners:	
Public Works, Police, Administration		Fire District, School District, DOGAMI, DLCD, FEMA, ODF	
Potential Funding Sources:		Estimated cost:	Timeline:
General fund, grants		Low	<input type="checkbox"/> Short (0-2 years) <input type="checkbox"/> Medium (2-5 years) <input type="checkbox"/> Long (6+ years) <input checked="" type="checkbox"/> Ongoing
Form Submitted by:	2019-20 NHMP Steering Committee		
Priority:	High		

Multi-Hazard #2

Proposed Action Item:		Alignment with Plan Goals:	
Incorporate mitigation planning provisions into all community planning processes such as comprehensive, capital improvement, land use, transportation plans, zoning and building ordinances, community development processes, etc. to demonstrate multi-benefit considerations and facilitate using multiple funding source consideration.		Goal 1, Goal 4, Goal 5, Goal 6, Goal 7, Goal 8	
Alignment with Existing Plans/Policies:			
Comprehensive Plan, Development Code, Building Code			
2020 Status/Rationale for Proposed Action Item:			
<p>Comprehensive plans provide the framework for the physical design of a community. They shape overall growth and development while addressing economic, environmental and social issues. Oregon’s statewide goals are accomplished through local comprehensive plans. State Law requires local governments to adopt a comprehensive plan and the zoning and land-division ordinances needed to put the plan into action.</p> <p>Integration of NHMPs into comprehensive plans and other plans will help to reduce a community’s vulnerability to natural hazards, support in mitigation activities, help to increase the speed in which action items are implemented and therefore the speed in which communities recover from natural disasters.</p> <p>Integration of NHMPs into local plans gives the action items identified in the NHMP legal status for guiding local decision-making regarding land use and/ or capital expenditures. .</p>			
Ideas for Implementation:			
<p>Conduct a policy crosswalk of the NHMP, the comprehensive plan, and other planning documents, to identify areas of possible integration.</p> <p>Integrate natural hazards information and policies into the comprehensive plan and other plans.</p> <p>Engage in collaborative planning and integration.</p> <p>Coordinate future NHMP and comprehensive plan reviews and updates.</p>			
Coordinating Organization:		Planning	
Internal Partners:		External Partners:	
Public Works, Administration		Yamhill County, DLCD	
Potential Funding Sources:		Estimated cost:	Timeline:
General fund, utility rates/fees		Medium	<input type="checkbox"/> Short (0-2 years) <input checked="" type="checkbox"/> Medium (2-5 years) <input type="checkbox"/> Long (6+ years) <input type="checkbox"/> Ongoing
Form Submitted by:	2019-20 NHMP Steering Committee		
Priority:	High		

Earthquake #1

Proposed Action Item:		Alignment with Plan Goals:	
Conduct seismic strength evaluations of critical facilities and infrastructure to identify vulnerabilities and seismically retrofit (structural and nonstructural) identified critical facilities and infrastructure to meet life safety standards in order to continue operations post-earthquake.		Goal 2, Goal 3, Goal 4, Goal 6, Goal 7, Goal 8	
Alignment with Existing Plans/Policies:			
2020 Status/Rationale for Proposed Action Item:			
<p>Currently, all new facilities must comply with and meet seismic standards. If someone moves into an old building, they must upgrade to current standards.</p> <p>DOGAMI did a windshield survey of schools, fire stations, police, and city halls (2007 RVS). The focus was on action of existing buildings and information was shared with participants.</p> <p>The Sheridan Fire District has been awarded an SRGP for approximately \$2.3 million. The seismic retrofit of the fire station is expected to be completed in 2021.</p>			
Ideas for Implementation:			
<p>Provide information to government building and school facility managers and teachers on nonstructural mitigation techniques including: securing bookcases, filing cabinets, light fixtures, and other objects that can cause injuries and block exits;</p> <p>Encourage facility managers, business owners, and teachers to refer to FEMA's practical guidebook: Reducing the Risks of Nonstructural Earthquake Damage;</p> <p>Use the FEMA 154 seismic evaluations generated by DOGAMI to prioritize critical and essential buildings for upgrades; and</p> <p>Target development located in potential fault zones or in unstable soils for intensive education and retrofitting resources.</p>			
Coordinating Organization:		Public Works	
Internal Partners:		External Partners:	
Administration, Planning		School District, Fire District, DOGAMI	
Potential Funding Sources:		Estimated cost:	Timeline:
General funds, utility fees, grants (SRGP, HMA)		High	<input type="checkbox"/> Short (0-2 years) <input type="checkbox"/> Medium (2-5 years) <input checked="" type="checkbox"/> Long (6+ years) <input type="checkbox"/> Ongoing
Form Submitted by:	2019-20 NHMP Steering Committee		
Priority:	High		

Earthquake #3

Proposed Action Item:		Alignment with Plan Goals:	
Educate property owners about structural and non-structural retrofitting of vulnerable buildings and encourage retrofit.		Goal 2, Goal 3, Goal 4	
Alignment with Existing Plans/Policies:			
2020 Status/Rationale for Proposed Action Item:			
<p>Increasing public outreach to educate residents about their risk to the earthquake hazards affecting their community and property as well as what to do in the event of a natural hazard will help decrease their vulnerability to the hazard.</p> <p>The Disaster Mitigation Act of 2000 requires communities to identify how the community will continue to involve the public in the plan maintenance process [201.6(c)(4)(iii)]. Educating property owners on how to mitigate the effects of natural hazards helps keep the public informed of what is being done with the plan, how the City is working to mitigate its risk to natural hazards, and allows for feedback and suggestions from the public for improving, updating, and maintaining the plan.</p>			
Ideas for Implementation:			
<p>Provide information to property owners (residential, commercial, institutional) on nonstructural mitigation techniques including: securing bookcases, filing cabinets, light fixtures, and other objects that can cause injuries and block exits;</p> <p>Encourage property owners and residents to refer to FEMA's practical guidebook: Reducing the Risks of Nonstructural Earthquake Damage;</p> <p>Encourage homeowners and renters to use Is Your Home Protected from Earthquake Disaster? A Homeowner's Guide to Earthquake Retrofit (IBHS) for economic and efficient mitigation techniques;</p> <p>Explore partnerships to provide retrofitting classes for homeowners, renters, building professionals, and contractors; and</p> <p>Target development located in potential fault zones or in unstable soils for intensive education and retrofitting resources.</p>			
Coordinating Organization:		Planning	
Internal Partners:		External Partners:	
		FEMA, DLCD, DOGAMI, OEM	
Potential Funding Sources:		Estimated cost:	Timeline:
General funds		Low	<input type="checkbox"/> Short (0-2 years) <input type="checkbox"/> Medium (2-5 years) <input type="checkbox"/> Long (6+ years) <input checked="" type="checkbox"/> Ongoing
Form Submitted by:	2019-20 NHMP Steering Committee		
Priority:	High		

Flood #1

Proposed Action Item:		Alignment with Plan Goals:	
Ensure continued compliance in the National Flood Insurance Program (NFIP) through enforcement of local floodplain management ordinances. Increase Community Rating System rating. Mitigate Repetitive Flood Loss Properties where possible.		Goal 1, Goal 2, Goal 3, Goal 4, Goal 5, Goal 6, Goal 7, Goal 8	
Alignment with Existing Plans/Policies:			
Comprehensive Plan, Storm Drainage Master Plan, Floodplain Ordinance, FIRMs, FIS			
2020 Status/Rationale for Proposed Action Item:			
<p>The National Flood Insurance Program (NFIP) provides communities with federally backed flood insurance, provided that communities develop and enforce adequate floodplain management measures. According to the NFIP, buildings constructed in compliance with NFIP building standards suffer approximately 80 percent less damage annually than those not built in compliance.</p> <p>The city has one repetitive flood loss property (single-family residence) located on Railroad Street.</p> <p>The Disaster Mitigation Act of 2000 requires that communities identify actions and projects that reduce the impact of a natural hazard on the community, particularly to new and existing buildings and infrastructure [201.6(c)(3)(ii)]. Continued participation in the NFIP will diminish flood damage to new and existing buildings in communities while providing homeowners, renters, and business owners with additional flood insurance protection.</p>			
Ideas for Implementation:			
<p>Actively participate with DLCD and FEMA during Community Assistance Visits. The Community Assisted Visit (CAV) is a scheduled visit to a community participating in the NFIP for the purpose of 1) conducting a comprehensive assessment of the community's floodplain management program; 2) assisting the community and its staff in understanding the NFIP and its requirements; and 3) assisting the community in implementing effective flood loss reduction measures when program deficiencies or violations are discovered. As of August 24, 2020, the City of Sheridan is in an ongoing CAV.</p> <p>Seek grant funding for structure elevation and relocation</p> <p>Establish eligibility criteria, focusing on repetitive loss properties and structures located at the lowest elevations</p> <p>Implement public outreach and information campaigns to identify and inform property owners of the program</p>			
Coordinating Organization:		Planning	
Internal Partners:		External Partners:	
Administration, Public Works		DLCD, DOGAMI, FEMA, USACE	
Potential Funding Sources:		Estimated cost:	Timeline:
General fund, DLCD Technical Assistance, FEMA Risk MAP		Low	<input type="checkbox"/> Short (0-2 years) <input type="checkbox"/> Medium (2-5 years) <input type="checkbox"/> Long (6+ years) <input checked="" type="checkbox"/> Ongoing
Form Submitted by:	2019-20 NHMP Steering Committee		
Priority:	High		

Flood #4

Proposed Action Item:		Alignment with Plan Goals:	
Improve sewer lagoon overflow protection from heavy rain		Goal 1, Goal 3, Goal 4, Goal 6, Goal 8	
Alignment with Existing Plans/Policies:			
Wastewater Facility Plan			
2020 Status/Rationale for Proposed Action Item:			
The Disaster Mitigation Act of 2000 requires communities to identify actions and projects that reduce the effects of hazards on the community [201.6(c)(3)(ii)]. Mitigating flood impacts to the wastewater treatment system will allow for continuous operation during a flood event and decrease interruptions during and after a hazard event.			
Ideas for Implementation:			
Implement improvements identified in the Wastewater Facility Plan.			
Coordinating Organization:		Public Works	
Internal Partners:		External Partners:	
Planning			
Potential Funding Sources:		Estimated cost:	Timeline:
General funds, HMA, utility fees		High	<input checked="" type="checkbox"/> Short (0-2 years) <input type="checkbox"/> Medium (2-5 years) <input type="checkbox"/> Long (6+ years) <input type="checkbox"/> Ongoing
Form Submitted by:	2019-20 NHMP Steering Committee		
Priority:	High		

Landslide #2

Proposed Action Item:		Alignment with Plan Goals:	
Update the storm drainage master plan to include regulations to control runoff, both for flood reduction and to minimize saturated soils on steep slopes that can cause landslides.		Goal 2, Goal 4, Goal 5, Goal 6, Goal 7, Goal 8	
Alignment with Existing Plans/Policies:			
Storm Drainage Master Plan, Comprehensive Plan, Development Code, Capital Improvement Plan			
2020 Status/Rationale for Proposed Action Item:			
The Disaster Mitigation Act of 2000 requires communities to identify actions and projects that reduce the effects of hazards on both new and existing buildings and infrastructure [201.6(c)(3)(ii)]. Updating the Storm Drainage Master Plan to include regulations to control runoff will decrease risk of stormwater flooding and landslides.			
Ideas for Implementation:			
Incorporate relevant aspects of the DLCDC Landslide Land Use Guide (" Preparing for Landslide Hazards, A Land Use Guide for Oregon Communities ") within the update.			
Coordinating Organization:		Public Works	
Internal Partners:		External Partners:	
Engineering, Planning		DLCDC, DOGAMI	
Potential Funding Sources:		Estimated cost:	Timeline:
General fund, Utility Fees, grants		Low	<input checked="" type="checkbox"/> Short (0-2 years) <input type="checkbox"/> Medium (2-5 years) <input type="checkbox"/> Long (6+ years) <input type="checkbox"/> Ongoing
Form Submitted by:		2019-20 NHMP Steering Committee	
Priority:		High	

Wildfire #1

Proposed Action Item:		Alignment with Plan Goals:	
Coordinate wildfire mitigation action items through the Yamhill County Community Wildfire Protection Plan.		Goal 1, Goal 2, Goal 3, Goal 4, Goal 5, Goal 6, Goal 7, Goal 8	
Alignment with Existing Plans/Policies:			
2020 Status/Rationale for Proposed Action Item:			
The wildfire mitigation action items provide direction on specific activities that organizations and residents in Sheridan/Yamhill County can take to reduce wildfire hazards.			
Ideas for Implementation:			
Implement high and medium priority projects including defensible space and fuels reduction projects identified in the CWPP.			
Coordinating Organization:		Sheridan Fire District	
Internal Partners:		External Partners:	
Planning		ODF	
Potential Funding Sources:		Estimated cost:	Timeline:
General fund		Medium	<input type="checkbox"/> Short (0-2 years) <input type="checkbox"/> Medium (2-5 years) <input type="checkbox"/> Long (6+ years) <input checked="" type="checkbox"/> Ongoing
Form Submitted by:	2019-20 NHMP Steering Committee		
Priority:	High		

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ATTACHMENT B: PUBLIC INVOLVEMENT SUMMARY

Members of the steering committee provided edits and updates to the NHMP prior to the public review period as reflected in the final document.

To provide the public information regarding the draft NHMP addendum, and provide an opportunity for comment, an announcement (see text below) was announced on the city's website.

During the public review period there were no comments provided.



The screenshot shows the official website of the City of Sheridan, Oregon. The header features a scenic image of a river and a bridge, with the text "the official site of SHERIDAN Oregon". Below the header is a navigation menu with links such as "Home Page", "Report a Potential Code Violation", "Neighborhood Watch Info", "Yard Sale Info & Permits", "Annual City BUDGET - 2020-2021", "Meeting Packets: City Council, Planning Commission, and Park and Recreation Committee", "Residential Water/Sewer Utility Account Set-Up", and "Candidate Application & Process Information". A search bar is located in the top right corner. The main content area displays a news article titled "Yamhill County Multi-jurisdictional Natural Hazard Mitigation Plan." The article text states: "Yamhill County, along with the cities within the county, are updating the Multi-Jurisdictional Natural Hazard Mitigation Plan (NHMP). Attached is the DRAFT Plan for the City of Sheridan. It will become an addendum to the Yamhill County document." Below the text is a link to the "DRAFT Natural Hazard Mitigation Plan for the City of Sheridan" and a link for a "Printer-friendly Version".

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City of Willamina Addendum to the Yamhill County Multi-Jurisdictional Hazard Mitigation Plan



Photo Credits: Willamina Website, Gary Halvorson, Oregon State Archives

Effective:

Not adopted or approved



Prepared for:

City of Willamina

Prepared by:

University of Oregon
Institute for Policy Research and Engagement
Oregon Partnership for Disaster Resilience

Planning grant funding provided by:



FEMA

Federal Emergency Management Agency (FEMA)
Pre-Disaster Mitigation Program
Grant: HMGP-DR4328-5-P-08
Disaster Award Number: 97-039

and

Additional Support Provided by:



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TO BE INCLUDED WHEN COMPLETE

City of Yamhill Addendum to the Yamhill County Multi-Jurisdictional Hazard Mitigation Plan



Photo Credits City of Yamhill Website/Pinterest

Effective: December 22, 2020 through December 21, 2025



City of Yamhill
A small taste of Oregon

Prepared for:

City of Yamhill

Prepared by:

University of Oregon
Institute for Policy Research and Engagement
Oregon Partnership for Disaster Resilience

Planning grant funding provided by:



FEMA

Federal Emergency Management Agency (FEMA)
Pre-Disaster Mitigation Program
Grant: HMGP-DR4328-5-P-OR
Disaster Award Number: 97.039

and

Additional Support Provided by:



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FEMA

January 20, 2021

The Honorable Casey Kulla
Chair Kulla, Yamhill County Board of Commissioners
535 NE 5th St.
McMinnville, Oregon 97128

Dear Chair Kulla:

On December 22, 2020, the U.S. Department of Homeland Security's Federal Emergency Management Agency (FEMA) Region 10, approved the Yamhill County Hazard Mitigation Plan as a multi-jurisdictional local plan as outlined in Code of Federal Regulations Title 44 Part 201. This approval provides the below jurisdictions eligibility to apply for the Robert T. Stafford Disaster Relief and Emergency Assistance Act's, Hazard Mitigation Assistance grants projects through December 21, 2025, through your state:

Yamhill County	City of Amity	City of Carlton	City of Dayton
City of McMinnville	City of Newberg	City of Sheridan	City of Yamhill

FEMA individually evaluates all application requests for funding according to the specific eligibility requirements of the applicable program. Though a specific mitigation activity or project identified in the plan may meet the eligibility requirements, it may not automatically receive approval for FEMA funding under any of the aforementioned programs.

Approved mitigation plans may be eligible for points under the National Flood Insurance Program's Community Rating System (CRS). For additional information regarding the CRS, please visit: www.fema.gov/national-flood-insurance-program-community-rating-system or contact your local floodplain manager. Over the next five years, we encourage your communities to follow the plan's schedule for monitoring and updating, and to develop further mitigation actions. To continue eligibility, jurisdictions must review, revise as appropriate, and resubmit the plan within five years of the original approval date.

If you have questions regarding your plan's approval or FEMA's mitigation grant programs, please contact Joseph Murray, Planner with Oregon Office of Emergency Management, at (503) 378-2911, who locally coordinates and administers these efforts.

Sincerely,

Kristen Meyers, Director
Mitigation Division

Enclosure

cc: Amie Bashant, Oregon Office of Emergency Management

EG:vl

CITY OF YAMHILL

RESOLUTION NO. R-775

A Resolution Adopting the City of Yamhill Representation in the Updates to the Yamhill County Multi-Jurisdictional Natural Hazards Mitigation Plan

Whereas, the City of Yamhill recognizes the threat that natural hazards pose to people, property and infrastructure within our community; and

Whereas, undertaking hazard mitigation actions will reduce the potential for harm to people, property and infrastructure from future hazard occurrences; and

Whereas, an adopted Natural Hazards Mitigation Plan is required as a condition of future funding for mitigation projects under multiple FEMA pre- and post-disaster mitigation grant programs; and

Whereas, the City of Yamhill has fully participated in the FEMA prescribed mitigation planning process to prepare the *Yamhill County, Multi-Jurisdictional Natural Hazard Mitigation Plan*, which has established a comprehensive, coordinated planning process to eliminate or minimize these vulnerabilities; and

Whereas, the City of Yamhill has identified natural hazard risks and prioritized a number of proposed actions and programs needed to mitigate the vulnerabilities of the City of Yamhill to the impacts of future disasters within the *Yamhill County, Multi-Jurisdictional Natural Hazard Mitigation Plan*; and

Whereas, these proposed projects and programs have been incorporated into the *Yamhill County, Multi-Jurisdictional Natural Hazard Mitigation Plan* that has been prepared and promulgated for consideration and implementation by the cities of Yamhill County; and

Whereas, the Oregon Office of Emergency Management and Federal Emergency Management Agency, Region X officials have reviewed the *City of Yamhill addendum to the Yamhill County Multi-Jurisdictional Natural Hazard Mitigation Plan* and pre-approved it (dated, September 10, 2020) contingent upon this official adoption of the participating governments and entities;

Whereas, the NHMP is comprised of comprised of three volumes: Volume I: Basic Plan, Volume II: Jurisdictional Addenda, and Volume III: Appendices, collectively referred to herein as the NHMP; and

Whereas, the NHMP is in an on-going cycle of development and revision to improve its effectiveness; and

Whereas, City of Yamhill adopts the NHMP and directs the City Recorder to develop, approve, and implement the mitigation strategies and any administrative changes to the NHMP.

Now, therefore, be it resolved, that the City of Yamhill adopts *the Yamhill County Multi-Jurisdictional Natural Hazards Mitigation Plan* as an official plan; and

Be it further resolved that the City of Yamhill will submit this Adoption Resolution to the Oregon Office of Emergency Management and Federal Emergency Management Agency, Region X officials to enable final approval of the *Yamhill County Multi-Jurisdictional Natural Hazards Mitigation Plan*.

INTRODUCED AND ADOPTED by the City Council of the City of Yamhill and signed by me authentication of its passage this 18th day of November 2020.

CITY OF YAMHILL, OREGON

AYES: 5

NAYS: 0

By: *Yvette Potter*
Yvette Potter
Mayor, City of Yamhill

ATTEST:
By: *Lori Gilmore*
Lori Gilmore
City Recorder/Treasurer

Purpose

This is an update of the Yamhill addendum to the Yamhill County Multi-Jurisdictional Natural Hazard Mitigation Plan (NHMP). This addendum supplements information contained in Volume I (Basic Plan) which serves as the NHMP foundation, and Volume III (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 Yamhill's addendum are further discussed throughout the NHMP, and within Volume III, Appendix B, which provides an overview of alterations to the document that took place during the update process.

The City of Yamhill adopted their addendum to the Yamhill County Multi-jurisdictional NHMP on **November 18, 2020**. FEMA Region X approved the Yamhill County NHMP and the City's addendum on **December 22, 2020**. With approval of this NHMP the City is now eligible to apply for the Robert T. Stafford Disaster Relief and Emergency Assistance Act's hazard mitigation project grants through [**December 21, 2025**].

Mitigation Plan Mission

The NHMP mission states the purpose and defines the primary functions of the 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 City concurs with the mission statement developed during the Yamhill County planning process (Volume I, Section 3):

To promote public policy and mitigation activities which will enhance the safety to life and property from natural hazards.

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

Mitigation Plan Goals

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

The City concurs with the goals developed during the Yamhill County planning process (Volume I, Section 3). All NHMP goals are important and are listed below in no 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.

Below is a list of the NHMP goals:

GOAL 1: EMERGENCY OPERATIONS

- Coordinate natural hazard mitigation activities, where appropriate, with emergency operations plans and procedures and with other agencies.

GOAL 2: EDUCATION AND OUTREACH

- Develop and implement education and outreach programs to increase public awareness of the risks associated with natural hazards.

GOAL 3: PARTNERSHIPS

- Develop effective partnerships with public and private sector organizations and significant agencies and businesses for future natural hazard mitigation efforts.
- Coordinate natural hazard mitigation actions between the County and local jurisdictions to create more cohesive and effective hazard mitigation efforts.

GOAL 4: PREVENTIVE

- Develop and implement activities to protect human life, commerce, and property from natural hazards.
- Reduce losses and repetitive damage for chronic hazard events while promoting insurance coverage for catastrophic hazards.

GOAL 5: NATURAL RESOURCES UTILIZATION

- Link natural resources management, land use planning, and watershed planning with natural hazard mitigation activities to protect natural systems and allow them to serve natural hazard mitigation functions.

GOAL 6: IMPLEMENTATION

- Implement strategies to mitigate the effects of natural hazards and increase the quality of life and resilience of economies in Yamhill.

GOAL 7: DEVELOPMENT

- Communities appropriately apply development standards that consider the potential impacts of natural hazards.

GOAL 8: DOCUMENTATION

- Document and evaluate progress in achieving hazard mitigation strategies and action items.

Process and Participation

This section of the NHMP addendum addresses 44 CFR 201.6(a)(3), *Participation*.

In addition to establishing a comprehensive community-level mitigation strategy, the Disaster Mitigation Act of 2000 (DMA2K), and the regulations contained in 44 CFR 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 pre-, and post-disaster mitigation project grants.

The Oregon Partnership for Disaster Resilience (OPDR) at the University of Oregon's Institute for Policy Research and Engagement (IPRE) collaborated with the Oregon Office of Emergency Management (OEM), Yamhill County, and Yamhill to update their NHMP. This project is funded through the Federal Emergency Management Agency's (FEMA) Hazard Mitigation Grant Program for DR-4328 (HMGP-DR-4328-OR-5-P). Members of the Yamhill NHMP Steering committee also participated in the County NHMP update process (Volume III, Appendix B).

The Yamhill County NHMP, and Yamhill addendum, are the result of a collaborative effort between citizens, public agencies, non-profit organizations, the private sector, and regional organizations. The Yamhill NHMP Steering Committee guided the process of developing the NHMP.

Convener and Committee

The Yamhill City Recorder/Emergency Coordinator serves as the NHMP addendum convener. The convener of the NHMP will take the lead in implementing, maintaining, and updating the addendum to the Yamhill County NHMP in collaboration with the designated convener of the Yamhill County NHMP (Yamhill County Emergency Manager).

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

This addendum reflects decisions made at the designated meetings, and during subsequent work, and communication with Yamhill County Emergency Manager, and 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, action items, and community profile.

The Yamhill steering committee was comprised of the following representatives:

- Convener, Lori Gilmore, City Recorder/Emergency Coordinator
- Mayor, Yvette Potter
- Police Chief, Greg Graven
- Public Works Superintendent, Bernard Malis
- Fire Chief, Brian Jensen
- Committee Member, Jay Disbrow, Council-President
- Yamhill-Carlton School District Superintendent, Charan Kline

Public Participation

Public participation was achieved by posting the NHMP publicly and providing community members the opportunity to make comments and suggestions during the review process. Community members were also provided an opportunity for comment via a survey administered by IPRE (Volume III, Appendix F). During the City public review period (Attachment B) there were no comments provided. Due to State mandated Coronavirus social distancing requirements, no in person public meetings were held.

Implementation and Maintenance

The City Council will be responsible for adopting the Yamhill addendum to the Yamhill County NHMP. This addendum designates the 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 Yamhill 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 Recorder/Emergency Coordinator 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; 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 City will utilize the same action item prioritization process as the County (Volume I, Section 4).

Implementation through Existing Programs

This NHMP is strategic and non-regulatory in nature, meaning that it does not necessarily set forth any new policy. It does, however, provide: (1) a foundation for coordination and collaboration among agencies and the public in the city; (2) identification and prioritization of future mitigation activities; and (3) aid in meeting federal planning requirements and qualifying for assistance programs. The mitigation plan works in conjunction with other city plans and programs including the Comprehensive Land Use Plan, Capital Improvements Plan, and Building Codes, as well as the [Yamhill County NHMP](#), and the [State of Oregon NHMP](#).

The mitigation actions described herein (and priority actions in Attachment A) 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, Yamhill 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. Implementation opportunities are further defined in action items when applicable.

Future development without proper planning may result in worsening problems associated with natural hazards. Yamhill's acknowledged comprehensive plan is the City of Yamhill Comprehensive Plan. The City implements the plan through the Community Development Code.

Yamhill currently has the following plans that relate to natural hazard mitigation. For a complete list contact the City or visit the City's [website: https://cityofyamhill.org/](https://cityofyamhill.org/).

- Comprehensive Plan
- [Yamhill Municipal Code and Development Code](#)
 - Title 7: Public Protection
 - Title 9: Building Codes (see below)
 - Title 10: Zoning
 - [Chapter 10.40 Flood Hazard Overlay Zone](#)
- Building Code, [2017 Oregon State Building Code](#) based on 2015 International Residential Code (IRC), and 2012 International Building Code (*to be updated to the 2020 Oregon State Building Code, anticipated October 2020*)
- Public Works Design Standards
- Water System Master Plan (2018)
- Wastewater Facilities Planning Study (2015)

Other plans:

- [Yamhill County Community Wildfire Protection Plan](#) (2009, revised Nov. 2015)

Government Structure

The Yamhill City Charter establishes a Council/Mayor form of government, which vests policy authority in a volunteer City Council, and administrative authority for day-to-day operations in a professional staff. The Yamhill City Council consists of a Mayor, who is elected at-large to serve a two-year term, and four Councilors who serve four-year terms. At least two Council positions are up for election every two years. Councilors are elected at-large. The two candidates who receive the highest number of votes are elected to the vacant seats. The Council meets at least once per month at City Hall. The agenda of each meeting includes time for citizen comment.

The City of Yamhill currently has the following departments which have a role in natural hazard mitigation:

Administration services are provided by the City Council and their professional staff that includes a City Recorder/Treasurer, City Clerk/Municipal Court Clerk, and an Administrative Clerk. Duties include strategic planning, budget and finance, and development of public policy recommendations to the City Council.

Public Works provides many of the basic urban services to the citizens of Yamhill, including water, wastewater, street, and park systems, and their maintenance and repair.

Building services are provided through a contract with Yamhill County Planning Commission and include plan review and inspections on commercial, industrial and residential developments.

Planning services are provided by Morgan CPS (John Morgan) and include all long range and current planning for new development, as well as the City's flood plain management zone. Planning is also responsible for implementation of the Comprehensive Plan. The City has a five-member volunteer planning commission.

Police services include law enforcement activities, emergency management (emergency preparedness, mitigation, response and recovery efforts for Yamhill during emergencies, disasters, or disruptions).

Fire protection services are provided through a contract with Yamhill Fire District. The fire station is in Yamhill. Services include fire suppression, hazardous materials incidents, and disaster response. Non-emergency services include fire prevention and inspection services, code enforcement, public safety education services/CPR training, and fire extinguisher use. The Fire District is lead by five elected Fire Board Directors, a Fire Chief/EMT, 28 volunteers, and a District Chaplain.

Continued Public Participation

An open public involvement process is essential to the development of an effective NHMP. To develop a comprehensive approach to reducing the effects of natural disasters, the planning process shall include opportunities for the public, neighboring communities, local, and regional agencies, as well as, private, and non-profit entities to comment on the NHMP during review.¹ Keeping the public informed of efforts to reduce its risk to future natural hazard events is important for successful NHMP implementation, and maintenance. As such, the City is committed to involving the public in the NHMP review and update process (Volume I, Section 4). The City posted the plan update for public comment before FEMA approval, and after approval will maintain the plan on the City's website:

<https://cityofyamhill.org/>

NHMP Maintenance

The Yamhill County NHMP, and City addendum will be updated every five years in accordance with the update schedule outlined in the Disaster Mitigation Act of 2000. During the County NHMP update process, the City will also review, and update its addendum (Volume I, Section 4). The convener will be responsible for convening the steering committee to address the questions outlined below.

- Are there new partners that should be brought to the table?
- Are there new local, regional, state or federal policies influencing natural hazards that should be addressed?

¹ Code of Federal Regulations, Chapter 44. Section 201.6, subsection (b). 2015

- Has the community successfully implemented any mitigation activities since the NHMP was last updated?
- Have new issues or problems related to hazards been identified in the community?
- Are the actions still appropriate given current resources?
- Have there been any changes in development patterns that could influence the effects of hazards?
- Have there been any significant changes in the community's demographics that could influence the effects of hazards?
- Are there new studies or data available that would enhance the risk assessment?
- Has the community been affected by any disasters? Did the NHMP accurately address the impacts of this event?

These questions will help the steering committee determine what components of the mitigation plan need updating. The steering committee will be responsible for updating any deficiencies found in the NHMP.

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) were first developed during the 2009 NHMP planning process and revised during subsequent NHMP updates. During these processes, the steering committee assessed the City's risk, identified potential issues, and developed a mitigation strategy (action items).

During the 2019-2020 update process the City re-evaluated their mitigation strategy (action items). During this process action items were updated, noting what accomplishments had been made, and whether the actions were still relevant; any new action items were identified at this time (see Volume III, Appendix B for more information on changes to action items).

Priority Action Items

Table YA-1 presents a list of mitigation actions. The steering committee 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 in **bold** text with grey 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 steering committee in terms of implementation, the steering committee 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 detailed information for each high priority action. Full text of the plan goals referenced in Table YA-1 is located on page YA-2.

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Table YA-I Yamhill Action Items

Natural Hazard Action ID	Action Item	Coordinating Organization (Lead)	Partners	Potential Funding	Cost	Timing	Plan Goals Addressed							
							Goal 1	Goal 2	Goal 3	Goal 4	Goal 5	Goal 6	Goal 7	Goal 8
Multi-Hazard Actions														
Multi-Hazard #1	Distribute public education and information materials concerning mitigation, preparedness and safety procedures for identified natural hazards. Materials provided from other sources.	City Hall	Public Works, Fire District, Police, School District, Planning	General fund, grants	L	Ongoing	✓	✓	✓			✓	✓	
Multi-Hazard #2	Cross reference and incorporate mitigation planning provisions into all community planning processes such as comprehensive, capital improvement, land use, transportation plans, etc to demonstrate multi-benefit considerations and facilitate using multiple funding source consideration.	City Hall	Public Works, Administration	General fund, DLCD TA, utility rates	L	Medium	✓			✓	✓	✓	✓	
Multi-Hazard #3	Coordinate installation of main power transfer switches, and backup power, for identified and prioritized critical facilities susceptible to short term power disruption. (i.e. gas station, shelters, food storage and service facilities, medical facilities, schools, correctional facilities, and water and sewage pump stations, etc.)	Public Works	Planning, Fire, Administration, School District, PGE/BPA, City Hall	General fund, utility rates	H	Long	✓		✓		✓	✓	✓	

Natural Hazard Action ID	Action Item	Coordinating Organization (Lead)	Partners	Potential Funding	Cost	Timing	Plan Goals Addressed							
							Goal 1	Goal 2	Goal 3	Goal 4	Goal 5	Goal 6	Goal 7	Goal 8
Multi-Hazard #4	Plan for solar + battery storage systems, which can serve as mini power-supply stations or provide residents the ability to shelter in place after any electricity supply-disrupting event, at varying scales (project, neighborhood and district) and locations (critical City facilities, low-income housing, community gathering spots).	City Hall	Planning, Public Works, Fire, Police	General fund, grants	M	Long	✓	✓	✓	✓		✓		✓
Multi-Hazard #5	Identify hazard specific areas and restrict property deeds for open space uses in perpetuity to keep people from rebuilding in hazard areas.	City Hall	Planning, Public Works	General fund, grants, Utility rates	L	Medium	✓	✓	✓	✓		✓		✓
Multi-Hazard #6	Develop prioritized list of mitigation actions for threatened critical facilities and other buildings or infrastructure.	City Hall	Planning, Public Works, Police, Fire District	General funds	L	Ongoing	✓	✓	✓	✓		✓	✓	✓

Drought Actions

No actions Identified at this time

Earthquake Actions

Earthquake #1	Conduct seismic strength evaluations of critical facilities and infrastructure to identify vulnerabilities and seismically retrofit (structural and nonstructural) identified critical facilities and infrastructure to meet life safety standards in order to	City Hall	School District, Fire District, Police, Public Works	General funds, utility fees, grants	H	Long		✓	✓	✓		✓	✓	✓
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Natural Hazard Action ID	Action Item	Coordinating Organization (Lead)	Partners	Potential Funding	Cost	Timing	Plan Goals Addressed							
							Goal 1	Goal 2	Goal 3	Goal 4	Goal 5	Goal 6	Goal 7	Goal 8
	continue operations post-earthquake.													
Earthquake #2	Encourage utility companies to evaluate and harden vulnerable infrastructure elements for sustainability.	Public Works	Utilities, City Hall	General fund, permit fees	L	Ongoing		✓	✓	✓		✓	✓	✓
Earthquake #3	Educate property owners about structural and non-structural retrofitting of vulnerable buildings and encourage retrofit.	City Hall	FEMA, DLCD, OEM, Fire District, Police	General fund, permit fees	L	Ongoing		✓	✓	✓				
Earthquake #4	Supplement State Seismic Needs Analysis data (schools, fire, law enforcement). Complete inventory of public and commercial buildings that may be particularly vulnerable to earthquake damage.	City Hall	Public Works, School District, Fire District, Police	General fund, permit fees	L	Ongoing		✓	✓	✓				
Flood Actions														
Flood #1	Ensure continued compliance in the National Flood Insurance Program (NFIP) through enforcement of local floodplain management ordinances.	City Hall	Administration, Public Works	General fund	L	Ongoing	✓	✓	✓	✓	✓	✓	✓	✓
Flood #2	Work with FEMA to update FIRMs. Request DOGAMI debris flow and lidar data be included in FIRM updates. Use the updated FIRMS for land use and mitigation planning.	City Hall	Public Works, FEMA, DOGAMI, DLCD	General fund, HMA	M	Medium	✓		✓	✓		✓		✓
Flood #3	Develop and maintain a GIS mapped inventory, and a prioritized list of critical facilities and	Public Works	Planning, City Hall, AKS Engineering	General fund, utility	L	Medium	✓		✓	✓		✓		✓

Natural Hazard Action ID	Action Item	Coordinating Organization (Lead)	Partners	Potential Funding	Cost	Timing	Plan Goals Addressed							
							Goal 1	Goal 2	Goal 3	Goal 4	Goal 5	Goal 6	Goal 7	Goal 8
Flood #4	residential and commercial buildings, within 100-year and 500-year floodplains.			fees, FEMA CTP										
	Develop and maintain an inventory of locations subject to frequent storm water flooding based on most current USACE/FEMA flood data.	Public Works	Planning, City Hall, AKS Engineering	General fund, utility fees	L	Medium	✓		✓	✓		✓		✓
Flood #5	Implement mitigation measures identified by critical facilities' owners, and other facility owners, to protect facilities located within the 100-year floodplain.	Public Works	City Hall, Planning, Fire District, Police, School District	General fund, HMA	H	Long			✓	✓		✓		✓
Flood #6	Identify and increase culvert size to increase its drainage efficiency.	Public Works	City Hall	General fund, ODOT grants, HMA	H	Long								
Landslide Actions														
Landslide #1	Utilize technology, geologic resources and other available data (such as DOGAMI LIDAR data) to identify and map potential areas for landslides - high, moderate and low.	Public Works	DOGAMI, Engineering	General fund, utility fees, grants	M	Medium	✓	✓	✓			✓		✓
Landslide #2	Update the storm water management plan to include regulations to control runoff, both for flood reduction and to minimize	Public Works	City Hall	General Fund, utility fees	M	Medium	✓	✓	✓			✓		✓

Natural Hazard Action ID	Action Item	Coordinating Organization (Lead)	Partners	Potential Funding	Cost	Timing	Plan Goals Addressed							
							Goal 1	Goal 2	Goal 3	Goal 4	Goal 5	Goal 6	Goal 7	Goal 8
	saturated soils on steep slopes that can cause landslides.													
Severe Weather Actions (Windstorm and Winter Storms – Snow/Ice)														
Severe Weather #1	Develop a web portal linking residents to various weather information sites. (NWS, FEMA, The Weather Channel). Develop early warning test program partnering with NOAA, City Police, Fire Departments, and Volunteer Fire Department to coordinate tests.	City Hall	Public Works, Police, Fire district, School District	General fund,	M	Ongoing		✓	✓	✓		✓		✓
Severe Weather #2	Increase power line wire size and incorporate quick disconnects (break away devices) to reduce ice load and wind storm power line failure during severe wind or winter ice storm events.	Public Works	City Hall, PGE	General funds, grants	M	Long		✓		✓		✓		✓
Severe Weather #3	Develop, implement, and maintain partnership program with electrical utilities to use underground utility placement methods where possible to reduce or eliminate power outages from severe winter storms.	Public Works	Planning, Utilities, property owners	General funds, grants	H	Medium		✓	✓	✓		✓		✓
Severe Weather #4	Implement tree clearing mitigation programs to keep trees from threatening lives, property, and public infrastructure from severe weather events.	Public Works	Planning, Utilities, property owners	General funds, grants	M	Ongoing		✓	✓	✓	✓	✓		✓

Natural Hazard Action ID	Action Item	Coordinating Organization (Lead)	Partners	Potential Funding	Cost	Timing	Plan Goals Addressed							
							Goal 1	Goal 2	Goal 3	Goal 4	Goal 5	Goal 6	Goal 7	Goal 8
Volcanic Event Actions														
Volcanic Event #1	Evaluate ash impact on stormwater drainage system, utility infrastructure, transportation network, public facilities, and develop mitigation actions.	Public Works	Engineering, Police, Fire District, City Hall	General funds, , grants	L	Long				✓	✓	✓	✓	
Wildfire Actions														
Wildfire #1	Coordinate wildfire mitigation action items through the Yamhill County Community Wildfire Protection Plan.	Fire District	City Hall	General fund, ODF, grants	M	Ongoing	✓	✓	✓	✓	✓	✓	✓	
Wildfire #2	Provide wildland fire information in an easily distributed format for all residents.	Fire District	City Hall	General fund	L	Ongoing	✓	✓	✓		✓		✓	

Source: City of Yamhill steering committee, 2020.

Note: Full text of the plan goals referenced in this table is located on page YA-2.

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, Section 2, and Volume III, Appendix C. The risk assessment process is graphically depicted in Figure YA-1. Ultimately, the goal of hazard mitigation is to reduce the area of risk, where hazards overlap vulnerable systems.

Figure YA-1 Understanding Risk



Hazard Analysis

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

Table YA-2 shows the HVA matrix for Yamhill 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 sense of hazard priorities but does not predict the occurrence of a hazard.

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

Table YA-2 Hazard Analysis Matrix

Hazard	Maximum		Total Threat Score	Hazard Rank	Hazard Tiers		
	History	Vulnerability				Threat	Probability
Winter Storm	16	40	80	56	192	#1	Top Tier
Earthquake - Cascadia	6	45	100	35	186	#2	
Windstorm	16	25	70	56	167	#3	
Wildfire	6	25	80	21	132	#4	Middle Tier
Drought	8	15	50	56	129	#5	
Flood	8	15	50	49	122	#6	
Earthquake - Crustal	6	20	60	21	107	#7	Bottom Tier
Landslide	10	15	40	35	100	#8	
Volcanic Event	4	10	30	7	51	#9	

Source: Yamhill steering committee, 2019-2020.

Table YA-3 categorizes the probability, and vulnerability scores from the hazard analysis for the City and compares the results to the assessment completed by the Yamhill County steering committee. Variations between the City, and County are noted in **bold** text within the city ratings.

Table YA-3 Probability and Vulnerability Comparison

Hazard	Yamhill		Yamhill County	
	Probability	Vulnerability	Probability	Vulnerability
Drought	High	Low	High	Moderate
Earthquake - Cascadia	Moderate	High	Moderate	High
Earthquake - Crustal	Low	Moderate	Low	Moderate
Flood	High	Moderate	High	High
Landslide	Moderate	Low	High	Low
Volcanic Event	Low	Low	Low	Low
Wildfire	Low	Moderate	Low	Low
Windstorm	High	Moderate	High	Moderate
Winter Storm	High	High	High	High

Source: Yamhill and Yamhill County steering committee, 2019-2020.

Community Characteristics Table YA-4 and the following section provides information on City specific demographics, and assets. 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. Between 2012 and 2019 the City grew by 85 people (8%).² According to the State's official coordinated population forecast, between 2019 and 2040 the City's population is forecast to grow by 27% to 301.³ *Note: the State is currently updating the official forecast and the proposed 2040 population is 1,364 which represents a 23% increase from 2019 population.*⁴ Median household income decreased by 5% between 2012 and 2017.⁵

There are two major housing developments since the previous plan that are either completed or underway: a 22-unit subdivision (Wydner Addition/Completed) at the south end of Balm Street between 3rd and 4th streets and a 62 unit subdivision (Yamhill Park Estates Subdivision) at the north end of Elm Street at Camelia Street, construction started spring of 2020. New development has complied with the standards of the [Oregon Building Code](#), and the city's development code including their floodplain ordinance.

Economy

The City of Yamhill is in the north-central portion of Yamhill County along the Tualatin Valley Highway (OR 47). The economy of Yamhill is largely related to agriculture and supporting services. Yamhill's commercial areas developed along primary routes, and residential development followed nearby (see Figure YA-2).

Most workers residing in the city (95%, 419 people) travel outside of the city for work primarily to McMinnville, Portland Metro area, Newberg, and Salem.⁶ Most of the city's workforce travels to the city (94%, 307 people) primarily from the surrounding unincorporated areas, McMinnville, Carlton, and Newberg.

Yamhill residents are employed in a variety of occupations including professional (15%), management, business, and financial operations (14%), sales (13%), construction (11%), office and administrative support (11%), and transportation and material moving (10%) occupations.⁷

The largest employers in the city are Yamhill-Carlton School District, AGS, A1 Logging, Mitchell Excavating, T& E Market, Yamhill Bar & grill.

Table YA-4 Community Characteristics

² Portland State University, Population Research Center, "Annual Population Estimates", 2019.

³ Portland State University, Population Research Center, "Oregon Population Forecast Program Cycle 1 (2014-2017)". 2017.

⁴ Portland State University, Population Research Center, "Oregon Population Forecast Program Cycle 2 (2018-2020)". 2020 (proposed).

⁵ Social Explorer, Table T57, U.S. Census Bureau, 2013-2017 and 2008-2012 American Community Survey Estimates.

⁶ U.S. Census Bureau. LEHD Origin-Destination Employment Statistics (2002-2017). Longitudinal-Employer Household Dynamics Program, accessed on April 25, 2020 at <https://onthemap.ces.census.gov>.

⁷ Social Explorer, Table A17008, U.S. Census Bureau, 2013-2017 American Community Survey Estimates.

Population Characteristics		
2012 Population	1,020	
2019 Population	1,105	
2040 Forecasted Pop. [Proposed]*	1,406 [1,364]	
Race (non-hispanic) and Ethnicity (Hispanic)		
White		91%
Black/ African American		0%
American Indian and Alaska Native		< 1%
Asian		1%
Native Hawaiian and Other Pacific Islander		0%
Some Other Race		0%
Two or More Races		4%
Hispanic or Latino		4%
Limited or No English Spoken	10	1%
Vulnerable Age Groups		
Less than 15 Years	326	24%
65 Years and Over	113	8%
Disability Status		
Total Population	191	14%
Children	16	4%
Seniors	55	49%

Income Characteristics		
Households by Income Category		
Less than \$15,000	6	1%
\$15,000-\$29,999	24	6%
\$30,000-\$44,999	40	9%
\$45,000-\$59,999	87	20%
\$60,000-\$74,999	68	16%
\$75,000-\$99,999	67	15%
\$100,000-\$199,999	113	26%
\$200,000 or more	33	8%
Median Household Income	\$74,167	
Poverty Rates		
Total Population	88	7%
Children	20	5%
Seniors	8	7%
Housing Cost Burden		
Owners with Mortgage	52	16%
Renters	31	30%

Source: U.S. Census Bureau, 2013-2017 American Community Survey; Portland State University, Population Research Center, "Annual Population Estimates", 2019. Portland State University, Population Research Center, "Oregon Population Forecast Program Cycle 1 (2014-2017)". 2017. and "Oregon Population Forecast Program Cycle 2 (2018-2020)". 2020 (proposed).

Housing Characteristics		
Housing Units		
Single-Family	423	90%
Multi-Family	22	5%
Mobile Homes	23	5%
Year Structure Built		
Pre-1970	170	36%
1970-1989	130	28%
1990-2009	139	30%
2010 or later	29	6%
Housing Tenure and Vacancy		
Owner-occupied	335	72%
Renter-occupied	103	22%
Seasonal	0	0%
Vacant	30	6%

Yamhill is in the north-central portion of Yamhill County. The North Yamhill River and Yamhill Creek and Rowland Creek are the major drainage basins of the city.

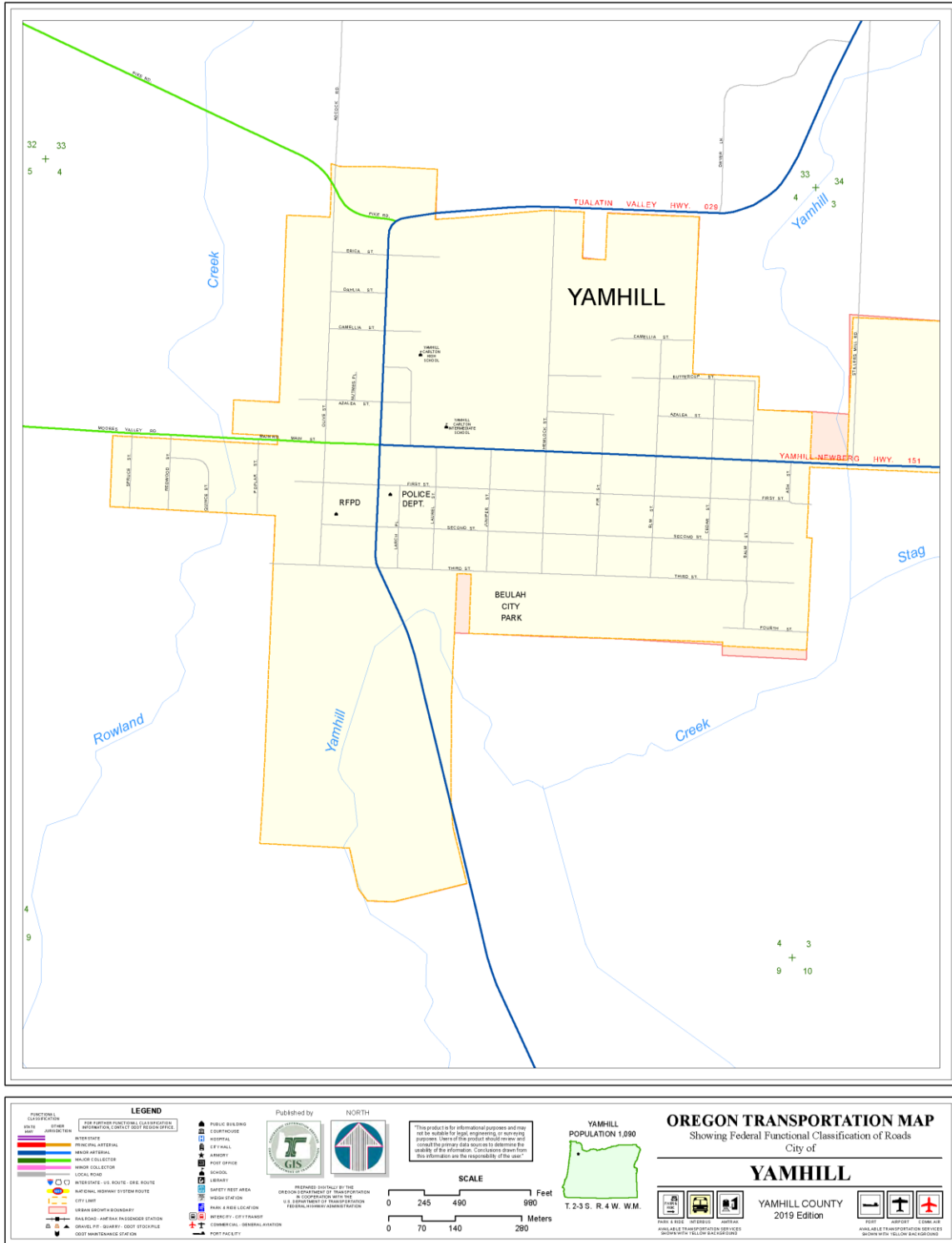
Yamhill is generally flat with hills located to the west of the city. Soils in Yamhill are moderately well-drained silt loam of the Woodburn series and the poorly drained Wapato silt loam series. The area is largely agricultural with uncultivated vegetation consisting of scattered Oak and Douglas Fir.

Yamhill's temperatures range from a monthly average low of 34-38°F in the winter months to average highs of 75-83°F in the summer months. The coolest month is December and the warmest months are July and August. The average annual precipitation is about 42 inches and approximately 73% falls between November and March.

The City has an educated population with 94% of residents 25 years, and older holding a high school degree and 18% have a bachelor's degree or higher.

Yamhill includes industrial and commercial development but is zoned primarily residential. Commercial development is on Maple and Main Street.

Figure YA-2 Oregon Transportation Map: City of Yamhill



Source: Oregon Department of Transportation

Community Assets

This section outlines the resources, facilities, and infrastructure that, if damaged, could significantly impact the public safety, economic conditions, and environmental integrity of Yamhill.

Critical facilities and infrastructure are those that support government and first responders' ability to act in an emergency. They are a top priority in any comprehensive hazard mitigation plan. These include locally designated shelters and other essential assets, such as fire stations, and water and wastewater treatment facilities (see Table YA-5). **Essential facilities and infrastructure** are those that support the continued delivery of key government services, and/or that may significantly impact the public's ability to recover from the emergency. These facilities may include: City buildings and other public facilities such as schools.

It is important to note that the facilities identified as "critical" and "essential" are characterized differently than the structural code that identifies buildings as "essential" and "non-essential." The structural code uses different language and criteria and therefore have completely different meanings than the buildings identified in this addendum.

Table YA-5 Critical and Essential Facilities

Facility Name	Address	
Government		
<i>See Table YA-6 for information on seismic vulnerability.</i>		
City Hall/Police/Community Center	205 S Maple St	Critical
Water Treatment Plant (not in City)	28875 NW Turner Creek Rd	Critical
Public Works Office, Lab, Shop	450 S Maple St	Critical
Sewage Lagoons (not in City)	450 S Maple St	Critical
US Post Office	180 W First St	Essential
Emergency Response		
Yamhill-Carlton SD Offices	120 N Larch Pl	Essential
Fire District Station/EOC	275 S Olive St	Critical
Police (City Hall)/AEOC	205 S Maple St	Critical
Educational (Public)		
Yamhill Intermediate School	310 E Main St	Essential
Yamhill-Carlton High School	275 N Maple St	Essential

Transportation/Infrastructure

Mobility plays an important role in Yamhill, and the daily experience of its residents, and businesses. Motor vehicles represent the dominant mode of travel through, and within Yamhill. Yamhill is served by Yamhill County Transit (route 33 connects Yamhill to Forest Grove to the north and McMinnville to the south).

Infrastructure that provides critical and essential services include:

Railroads

There is no freight or passenger rail service in the city.

Airports

The city has no commercial service airports, however Portland International Airport (PDX), the largest and busiest airport in the state, is in nearby Multnomah County. The closest municipal airport is in McMinnville.

Roads/Seismic lifelines

The Tualatin Valley Highway (OR 47) is the major north-south transportation route through the city. Main St/Moores Valley Rd/Yamhill-Newberg Hwy (OR 240) is the major east-west transit route in the city (see Figure YA-2).

Seismic lifeline routes help maintain transportation facilities for public safety and resilience in the case of natural disasters. Following a major earthquake, it is important for response and recovery agencies to know which roadways are most prepared for a major seismic event. The Oregon Department of Transportation has identified lifeline routes to provide a secure lifeline network of streets, highways, and bridges to facilitate emergency services response after a disaster.⁸

System connectivity and key geographical features were used to identify a three-tiered seismic lifeline system. Routes identified as Tier 1 are considered the most significant and necessary to ensure a functioning statewide transportation network. The Tier 2 system provides additional connectivity to the Tier 1 system, it allows for direct access to more locations and increased traffic volume capacity. The Tier 3 lifeline routes provide additional connectivity to the systems provided by Tiers 1 and 2.

The Lifeline Routes in Yamhill:

- Tier I: None
- Tier II: None
- Tier III: None

Bridges

Because of earthquake risk, the seismic vulnerability of the county's bridges is an important issue. Non-functional bridges can disrupt emergency operations, sever lifelines, and disrupt local and freight traffic. These disruptions may exacerbate local economic losses if industries are unable to transport goods. Bridges within the city that are critical or essential include:

- Yamhill Creek, Hwy 29 (OR 47) (ODOT 00526A)
- Yamhill Creek, Hwy 151 (OR 240) (ODOT 05034) – outside city to east
- Stage Hollow Creek (Ash Creek), Hwy 151 (OR 240) (ODOT 05180A) – outside city to east
- Rowland Creek, E. Main St.(Moores Valley Rd.)
- Unnamed ditch, Hwy 151 (OR 240) 48" Culvert
- Unnamed ditch, First St, 36" culvert
- Unnamed ditch, Third St. Culvert

⁸ Oregon Department of Transportation. Oregon Seismic Lifeline Evaluation Vulnerability Synthese Identification, *Oregon Seismic Lifeline Routes*, May 15 2012. Page 6-4 figure 6-1. Accessed September 12, 2019.

Figure YA-3 Oregon Bridges and Structurally Deficient Bridges



Source: Oregon Department of Transportation, ODOT TransGIS, accessed May 2, 2020

Utility Lifelines

Utility lifelines are the resources that the public relies on daily such as, electricity, fuel and communication lines. If these lines fail or are disrupted, the essential functions of the community can become severely impaired. Utility lifelines are closely related to physical infrastructures, like dams and power plants, as they transmit the power generated from these facilities.

Generally, the network of electricity transmission lines running throughout the city is operated by Portland General Electric.⁹ The Williams Gas Pipeline provides natural gas that is delivered to customers in the city by Northwest Natural Gas. These lines may be vulnerable as infrequent natural hazards, like earthquakes, could disrupt service to natural gas consumers across the region.

The city water and wastewater systems include the following:

- Water treatment plant (28875 NW Turner Creek Rd)
- 2 Water storage tanks (500,000 gallons each) (NW Reservoir Rd)
- Pump stations : None
- Approx. 15,322 feet transmission pipes
- Approx. 42,888 feet of distribution pipes
- Wastewater Treatment Plant and 4 Sewer treatment lagoons (450 S Maple St)
- Lift stations (Two, 450 S Maple St, 1050 E 1st St)
- Waste Water Gravity Mains: 33,900 Feet.

⁹ Allan, Stuart et. al., Atlas of Oregon. Pg. 102.

Environmental Assets/Parks:

Environmental assets are those parks, green spaces, wetlands, and rivers that provide an aesthetic, and functional ecosystem services for the community include Beulah Park, Heinrich Park, and as yet un-named planned city park, Track B, within Yamhill Park Estates.

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:

Child Care Facilities: None

Adult Care Facilities: None

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 Yamhill 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. The following historic resources can be found in the City of Yamhill:

Lee Laughlin House (National Register)

Beverly Cleary House (National Register)

Hazard Characteristics

Drought

The steering committee determined that the City's probability for drought is **high**, and that their vulnerability to drought is **low**.

Volume I, Section 2 describes the characteristics of drought hazards, history, as well as the location, extent, and probability of a potential event. Due to the climate of Yamhill County, past, and present weather conditions have shown an increasing potential for drought.

The City of Yamhill owns and operates a water treatment facility that supports 100% of the water supply for the City. The existing water capacity allows for a minimum of 0.1 million gallons per day (mgd) to a maximum of 1.3 mgd via one water transmission main.

The city has two storage tanks each with a 500,000-gallon capacity.

Vulnerability Assessment

Due to insufficient data and resources, Yamhill is currently unable to perform a quantitative risk assessment, or exposure analysis, for this hazard. State-wide 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 apply to humans and

resources. Industries important to the City of Yamhill's local economy such as agriculture, and timber have historically been affected, and any future droughts would have tangible economic and potentially human impacts.

Mitigation Activities

The City engages in water conservation measures including water line leak detection and repair, replacement of deteriorating pipe (including major transmission and distribution line improvements in 2015), and replacement/repair of older and under-registering water meters and reducing dead end lines in order to increase water circulation throughout the system.

Yamhill Codes Pertaining to Droughts

The following Yamhill codes, plans, and policies pertain to droughts:

1. Yamhill Comprehensive Plan.
2. Yamhill provides water conservation tips to residents that include voluntary measures individuals and households can take to increase conservation of water during times of low water availability.
3. The City has a Water System Master Plan.

Please review Volume I, Section 2 for additional information on this hazard.

Earthquake (Cascadia Subduction Zone)

The steering committee determined that the City's probability for a Cascadia Subduction Zone (CSZ) earthquake is **moderate** and that their vulnerability to a CSZ earthquake is **high**.

Volume I, Section 2 describes the characteristics of earthquake hazards, history, as well as the location, extent, and probability of a potential event. Generally, an event that affects the County is likely to affect Yamhill as well. The causes, and characteristics of an earthquake event are appropriately described within the 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 Yamhill as well.

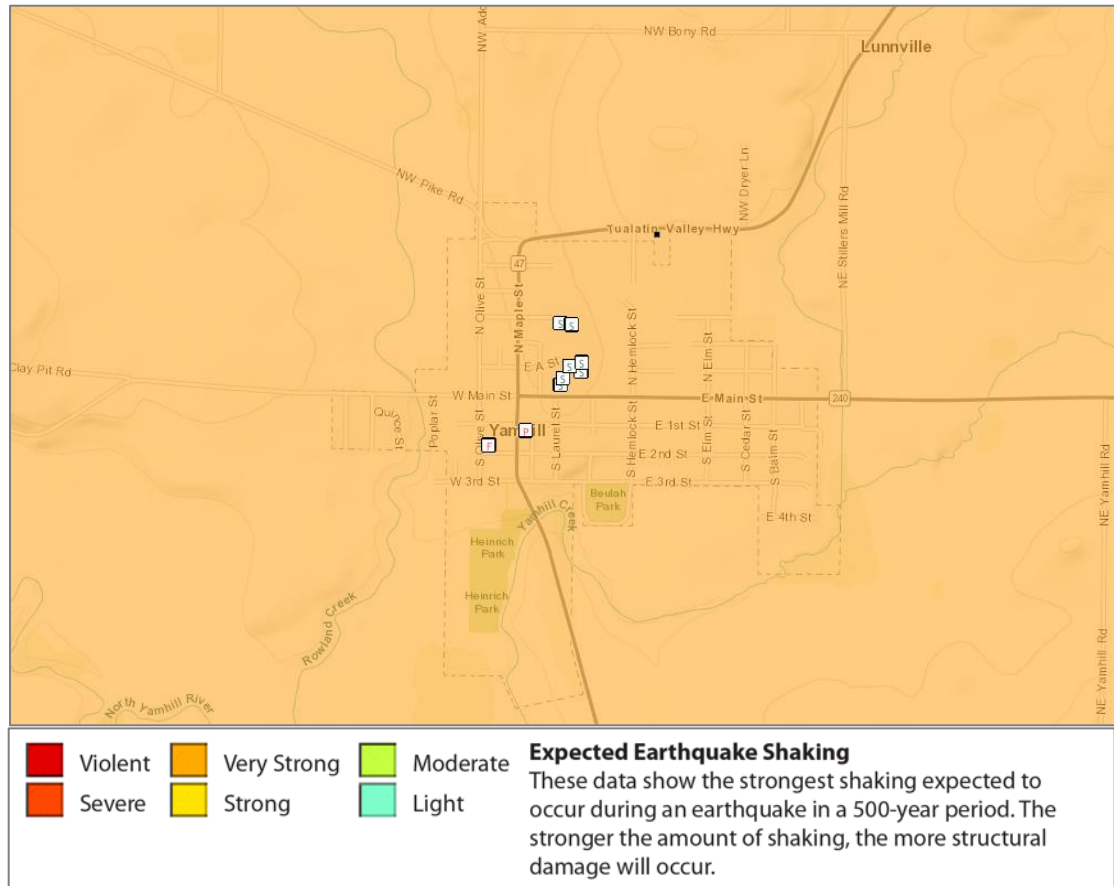
Within the Northern Willamette Valley are that includes Yamhill County, two potential faults and/or zones can generate high-magnitude earthquakes. These include the Cascadia Subduction Zone and the Gales Creek-Newberg-Mt. Angel Structural Zone (including the Newberg Fault).

Cascadia Subduction Zone

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 approximately 1700 A.D.¹⁰

Figure YA-4 displays relative shaking hazards from a Cascadia Subduction Zone earthquake event. As shown in the figure, the City is expected to experience very strong (orange) shaking in a CSZ event.

Figure YA-4 Cascadia Subduction Zone Expected Shaking



Source: [Oregon HazVu: Statewide Geohazards Viewer \(DOGAMI\)](#)

Note: To view detail click the link above to access Oregon HazVu.

The city'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 City a high-risk profile. Due to the expected pattern of damage resulting from a CSZ event, the

¹⁰ The Cascadia Region Earthquake Workgroup, 2005. Cascadia Subduction Zone Earthquakes: A magnitude 9.0 earthquake scenario. <http://www.crew.org/PDFs/CREWSubductionZoneSmall.pdf>

Oregon Resilience Plan divides the State into four distinct zones, and places Yamhill within the “Valley Zone” (Valley Zone, from the summit of the Coast Range to the summit of the Cascades). Within the Northwest Oregon region, 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.

Earthquake (Crustal)

The steering committee determined that the City’s probability for a crustal earthquake is **low** and that their vulnerability to crustal earthquake is **moderate**.

Volume I, Section 2 describes the characteristics of earthquake hazards, history (see below), as well as the location, extent, and probability of a potential event. Generally, an event that affects the County is likely to affect Yamhill 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 Yamhill as well.

Figure YA-5 shows a generalized geologic map of the Yamhill area that includes the areas for potential regional active faults, earthquake history (1971-2008), and soft soils (liquefaction) hazard. The figure shows the areas of greatest concern within the City limits as red (High liquefaction hazard). The inset map shows the county including the Newberg Fault and hazard history.

Vulnerability Assessment (subduction zone and crustal)

Due to insufficient data and resources, Yamhill is currently unable to perform a quantitative risk assessment for this hazard. The western portion of Yamhill County is likely to experience higher levels of shaking than the eastern portion, as a result of its proximity to the Cascadia Subduction Zone.

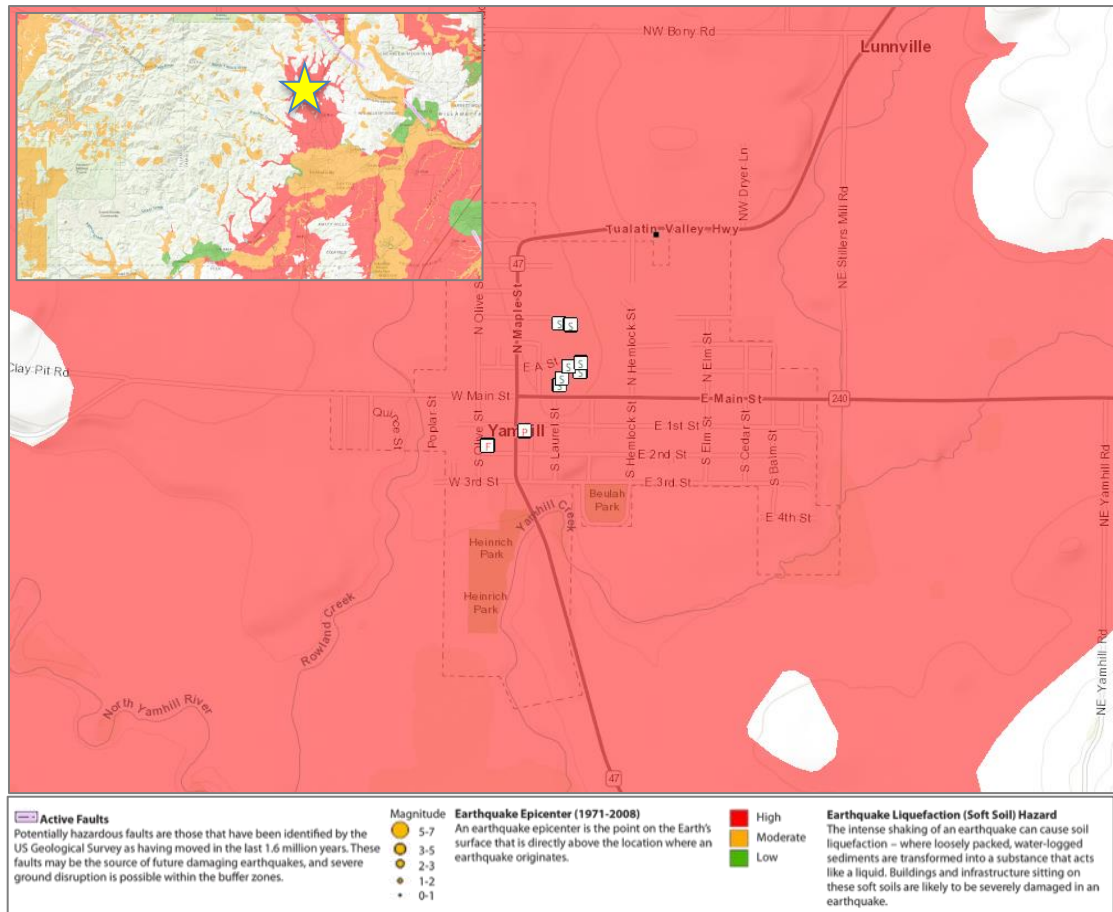
The City of Yamhill is in the north-central portion of Yamhill County, in a region likely to experience strong shaking should a subduction zone or significant crustal earthquake occur. This rating represents the peak acceleration of the ground caused by the earthquake, and for a strong designation corresponds to 9-20 percent of the acceleration of gravity. The City is also in an area prone to liquefaction (soft soils) during either a subductions zone or crustal earthquake event. Yamhill is located more distant from crustal earthquake faults (the closest is the Newberg fault approximately 10 miles to the southeast) and has not experienced a damaging earthquake.

Ground movement is likely to cause damage to weak, unreinforced masonry buildings, and to induce small landslides along unstable slopes. As well as landslide, earthquakes can trigger other hazards such as dam failure and disruption of transportation and utility systems.

Utility systems will be significantly damaged, including damaged buildings, and damage to utility infrastructure, including water 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. 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.

Figure YA-5 Active Crustal Faults, Epicenters (1971-2008), and Soft Soils



Source: [Oregon HazVu: Statewide Geohazards Viewer \(DOGAMI\)](#)

Note: To view detail click the link above to access Oregon HazVu.

Building codes were implemented in Oregon in the 1970s, however, stricter standards did not take effect until 1991 and early 2000s. As noted in the community characteristics section (Table YA-4), approximately 64% of residential buildings were built prior to 1990, which increases the City's vulnerability to the earthquake hazard. Information on specific public buildings' (schools and public safety) estimated seismic resistance, determined by DOGAMI in 2007, is shown in Table YA-6; each "X" represents one building within that ranking category. Of the facilities evaluated by DOGAMI using their Rapid Visual Survey (RVS), none have a very high (100% chance) collapse potential, one building at the Yamhill Elementary School has a high (greater than 10% chance) collapse potential.

Table YA-6 Rapid Visual Survey Scores

Facility	Site ID*	Level of Collapse Potential			
		Low (<1%)	Moderate (>1%)	High (>10%)	Very High (100%)
Schools					
Yamhill Intermediate (310 E Main St)	Yamh_sch03	X,X,X	X	X	
Yamhill-Carlton High (275 N Maple St)	Yamh_sch18	X,X			
Public Safety					
Yamhill Fire/EOC (275 S Olive St)	Yamh_fir09	SRGP 2015-17 Phase II: \$594,410			
Yamhill Police/City Hall (205 N Maple St)	Yamh_pol05		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 Yamhill County Map](#)

Mitigation Activities

Earthquake mitigation activities listed here include current mitigation programs and activities that are being implemented by Yamhill agencies or organizations.

A primary mitigation objective is to construct or upgrade critical and essential facilities and infrastructure to withstand future earthquake events. Seismic retrofit grant awards per the [Seismic Rehabilitation Grant Program](#)¹¹ have been funded to retrofit the Fire District Station (2015-17, Phase II, grant award, \$815,687).

Yamhill Codes Pertaining to Earthquakes

The following Yamhill codes, plans, and policies pertain to earthquakes:

1. Yamhill Comprehensive Plan.
2. The City of Yamhill enforces the [Oregon Building Code](#) which includes provisions for earthquakes.

Please review Volume I, Section 2 for additional information on this hazard.

Flood

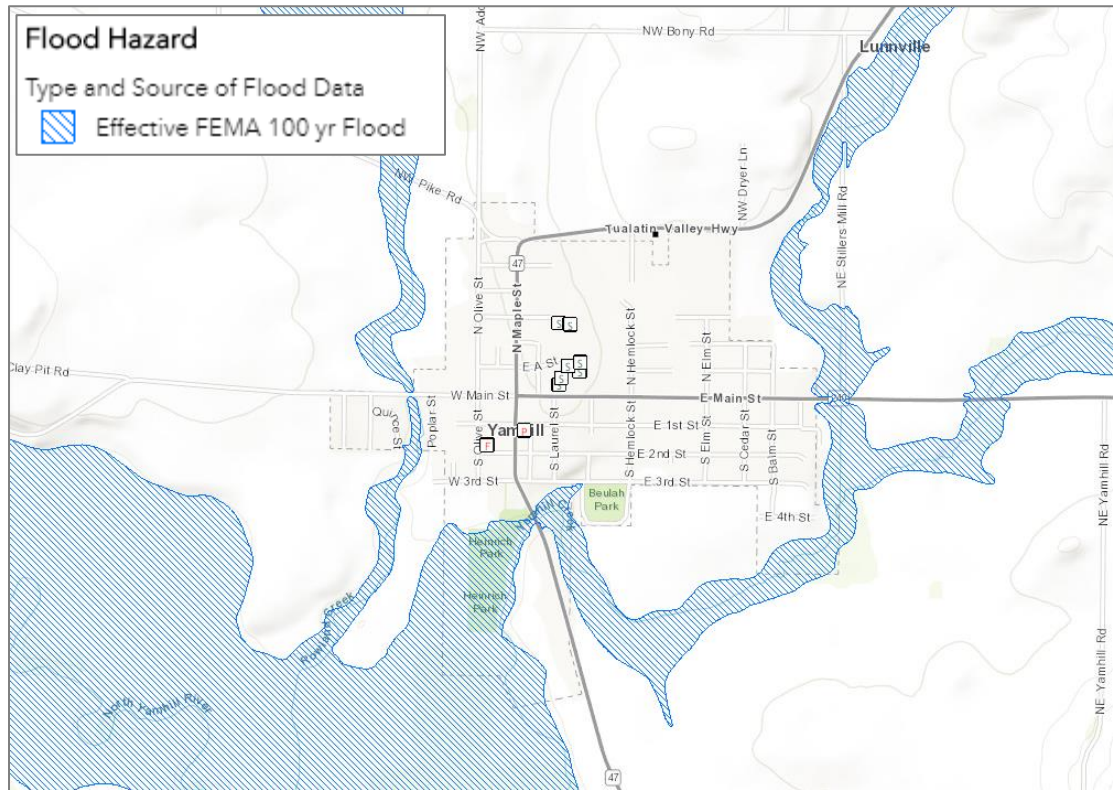
The steering committee determined that the City’s probability for flood is **moderate** and that their vulnerability to flood is **low**.

Volume I, Section 2 describes the characteristics of flood hazards, history, as well as the location, extent, and probability of a potential event. Portions of Yamhill have areas of

¹¹ 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.

floodplains (special flood hazard areas, SFHA). However, all residential and employment lands are outside of the SFHA (Figure YA-6).

Figure YA-6 Special Flood Hazard Area



Source: [Oregon HazVu: Statewide Geohazards Viewer \(DOGAMI\)](#)

Note: To view detail click the link above to access Oregon HazVu.

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 Yamhill 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.

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. Business owners, and their employees are significantly impacted by flood events. Direct damages from flooding are the most common impacts, but indirect damages, such as diminished clientele, can be just as debilitating to a business.

Vulnerability Assessment

Due to insufficient data and resources, Yamhill is currently unable to perform a quantitative risk assessment for this hazard. FEMA FIRMs were used to outline the 100-year and 500-year floodplains for the City of Yamhill. The 100-year floodplain delineates an area of high

risk, while the 500-year floodplain delineates an area of moderate risk. Most special flood hazard areas are within agricultural or open space use. Commercial development is generally located in the center of Yamhill and is outside the special flood hazard area. The city's sewage lagoons just outside the southwest corner of the city (south of Heinrich Park) are in an area susceptible to flooding from the Rowland Creek and Yamhill Creek.

National Flood Insurance Program (NFIP)

FEMA's Flood Insurance Study (FIS), and Flood Insurance Rate Maps (FIRMs) are effective as of March 2, 2010. Table YA-7 shows that as of August 2019, Yamhill has three (3) National Flood Insurance Program (NFIP) policies in force for single-family residential properties built after the initial FIRMs. The city's last Community Assistance Visit (CAV) was January 1, 1991. The City does not participate in the Community Rating System (CRS). There has been one paid flood insurance claim for \$7,280. The City complies with the NFIP through enforcement of their flood damage prevention ordinance and their floodplain management program.

Table YA-7 Flood Insurance Detail

	Yamhill County	Yamhill
Effective FIRM and FIS	3/2/2010	3/2/2010
Initial FIRM Date	-	3/1/1982
Total Policies	446	3
Pre-FIRM Policies	153	0
Policies by Building Type		
Single Family	401	3
2 to 4 Family	14	0
Other Residential	10	0
Non-Residential	21	0
Minus Rated A Zone	72	0
Insurance in Force	\$100,617,300	\$1,002,500
Total Paid Claims	81	1
Pre-FIRM Claims Paid	68	0
Substantial Damage Claims	3	0
Total Paid Amount	\$1,166,076	\$7,280
Repetitive Loss Structures	4	0
Severe Repetitive Loss Properties	1	0
CRS Class Rating	-	NP
Last Community Assistance Visit	-	1/1/1991

Source: Department of Land Conservation and Development, August 2019. Repetitive Flood Loss information provided by FEMA correspondence on September 10, 2020. NP = Not Participating

The Community Repetitive Loss record for Yamhill identifies no Repetitive Loss Properties¹² or Severe Repetitive Loss Properties¹³.

Mitigation Activities

Flood mitigation activities listed here include current mitigation programs and activities that are being implemented by Yamhill agencies or organizations.

Yamhill Codes Pertaining to Flooding

The following Yamhill codes, plans, and policies pertain to flooding:

1. Yamhill Comprehensive Plan.
2. Yamhill Development Code Chapter 10.40 *Flood Hazard Overlay Zone*. This portion of the Community Development Code implements the Goal 7 policies of the Comprehensive Plan and regulates development within the floodplain.

Please review Volume I, Section 2 for additional information on this hazard.

Landslide

The steering committee determined that the City's probability for landslide is **low** and that their vulnerability to landslide is **low**.

Volume I, Section 2 describes the characteristics of landslide hazards, history, as well as the location, extent, and probability of a potential event within the region.

Landslide susceptibility exposure for Yamhill is shown in Figure YA-7. Approximately 1% of Yamhill has very high or high, and approximately 25% moderate, landslide susceptibility exposure.¹⁴ Within the City areas of higher landslide risk tend to be located adjacent to Yamhill Creek and Rowland Creek and indicate erosion potential. In general, the areas of greater risk are located outside of the city to the west, north, and east. *Note that even if a jurisdiction has a high percentage of area in a high or very high landslide exposure susceptibility zone, this does not mean there is a high risk, because risk is the intersection of hazard, and assets.*

Potential landslide-related impacts are adequately described within Volume I, Section 2, and include infrastructure 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 occur during any winter, and thoroughfares beyond City limits are susceptible to obstruction as well.

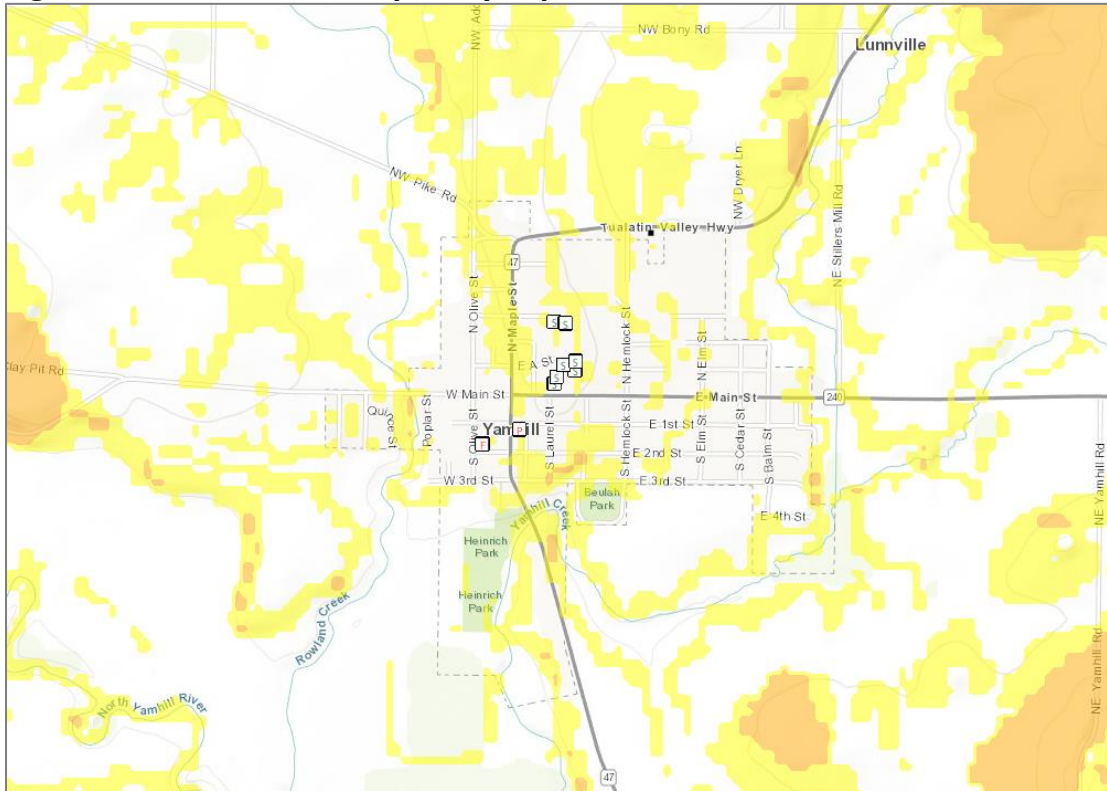
¹² A Repetitive Loss (RL) property is any insurable building for which two or more claims of more than \$1,000 were paid by the National Flood Insurance Program (NFIP) within any rolling ten-year period, since 1978. A RL property may or may not be currently insured by the NFIP.

¹³ 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.

¹⁴ DOGAMI. [Open-File Report, O-16-02](#), *Landslide Susceptibility Overview Map of Oregon* (2016)

The most common type of landslides 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.

Figure YA-7 Landslide Susceptibility Exposure



Low	Landsliding unlikely. Areas classified as Landslide Density = Low (less than 7%) and areas classified as Slopes Prone to Landsliding = Low.
Moderate	Landsliding possible. Areas classified as Landslide Density = Low to Moderate (less than 17%) and areas classified as Slopes Prone to Landsliding = Moderate OR areas classified as Landslide Density = Moderate (7%-17%) and areas classified as Slopes Prone to Landsliding = Low.
High	Landsliding likely. Areas classified as Landslide Density = High (greater than 17%) and areas classified as Slopes Prone to Landsliding = Low and Moderate OR areas classified as Landslide Density = Low and Moderate (less than 17%) and areas classified as Slopes Prone to Landsliding = High.
Very High	Existing landslides Landslide Density and Slopes Prone to Landsliding data were not considered in this category. Note: the quality of landslide inventory (existing landslides) mapping varies across the state.

Source: [Oregon HazVu: Statewide Geohazards Viewer \(DOGAMI\)](#)

Note: To view detail click the link above to access Oregon HazVu

Vulnerability Assessment

Due to insufficient data and resources, Yamhill is currently unable to perform a quantitative risk assessment for this hazard. DOGAMI completed a statewide landslide susceptibility assessment in 2016 ([O-16-02](#)), general findings from that report are provided above and within Figure YA-7. Response and recovery efforts will likely vary from minor cleanup to more extensive utility system rebuilding. Utility disruptions are usually local and terrain dependent. Damages may require reestablishing electrical, communication, and gas pipeline

connections occurring from specific breakage points. Initial debris clearing from emergency routes and high traffic areas may be required. Water and wastewater utilities may need treatment to quickly improve water quality by reducing excessive water turbidity and reestablishing waste disposal capability.

Mitigation Activities

Landslide mitigation activities listed here include current mitigation programs and activities that are being implemented by the City of Yamhill agencies or organizations. The city's former water intake had been vulnerable to landslides, however, in 2012 the city relocated its water intake to a safer location. In 2013, the former dam and fish ladder were removed.

City of Yamhill Codes Pertaining to Landslides

The following Yamhill codes, plans, and policies pertain to landslides:

1. Yamhill Comprehensive Plan.
2. The City of Yamhill enforces the [Oregon Building Code](#) which includes provisions that address the potential of geologic hazards including landslides.

Please review Volume I, Section 2 for additional information on this hazard.

Severe Weather

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

Windstorm

The steering committee determined that the City's probability for windstorm is **high** and that their vulnerability to windstorm is **moderate**.

Volume I, Section 2 describes the characteristics of windstorm hazards, history, 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 flooding and winter storms (ice, freezing rain, and very rarely, snow). Other severe weather events that may accompany windstorms, including thunderstorms, hail, lightning strikes, and tornadoes are generally negligible for Yamhill.

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.

Damage from high winds generally has resulted in downed utility lines, and trees usually limited to several localized areas. 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 may cause localized urban flooding.

Please review Volume I, Section 2 for additional information on this hazard.

Winter Storm (Snow/Ice)

The steering committee determined that the City's probability for winter storm is **high** and that their vulnerability to winter storm is **high**.

Volume I, Section 2 describes the characteristics of winter storm hazards, history, 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.

Vulnerability Assessment

Due to insufficient data and resources, Yamhill is currently unable to perform a quantitative risk assessment, or exposure analysis, for the windstorm and winter storm hazards. All areas within the City of Yamhill are equally at risk of a windstorm or winter storm event.

Mitigation Activities

The City works to mitigate problems regarding windstorm and winter storm issues when they arise. Mitigation activities listed here include current mitigation programs and activities that are being implemented by Yamhill agencies or organizations.

- ODOT is responsible for sanding and de-icing state managed roads including: OR 47 and OR 240 within city limits.
- The City requires that all new utility lines, cables or wires, on new development be placed underground.
- The City via Yamhill County and the Yamhill Fire District provides education on winter weather preparedness
- The City encourages property owners to trim hazard trees, and to maintain trees within public rights-of-way. Utility companies maintain trees along their utility easements.

City of Yamhill Codes Pertaining to Windstorms and Winter Storms

The following Yamhill codes, plans, and policies pertain to windstorms and winter storms:

1. The City of Yamhill Development Code provides standards for public infrastructure and utilities, including design.
2. The City of Yamhill enforces the [Oregon Building Code](#) which regulates building material requirements and includes provisions for windstorms and winter storms.

Please review Volume I, Section 2 for additional information on this hazard.

Volcanic Event

The steering committee determined that the City's probability for a volcanic event is **low** and that their vulnerability to a volcanic event is **low**.

Volume I, Section 2 describes the characteristics of volcanic hazards, history, as well as the location, extent, and probability of a potential event within the region. Generally, an event that affects the Eastern portion of the County is likely to affect Yamhill as well. Several volcanoes are located near Yamhill, the closest of which are Mount Hood, Mount Adams, Mount Saint Helens, Mount Rainier, and the Three Sisters.

Due to Yamhill'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). Although the City of Yamhill is unlikely to experience lahars or lava flows, tephra (sand- sized or finer particles of volcanic rock that is ejected rapidly into the air from volcanic vents) drifts downwind from the explosions and can form a blanket-like deposit of ash. 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 heavier coating of ash. Tephra is a public health threat, and can damage agriculture and transportation systems (i.e., aircraft and on- the-ground vehicles). Tephra can also clog drainage systems and create major debris management problems. Within Yamhill, public health would be a primary concern, and keeping transportation routes open/accessible would be important as well.

Vulnerability Assessment

Due to insufficient data and resources, Yamhill is currently unable to perform a quantitative risk assessment, or exposure analysis, for this hazard.

Mitigation Activities

The existing volcanic event hazard mitigation activities are conducted at the county, regional, state, and federal levels and are described in the Yamhill County NHMP.

City of Yamhill Codes Pertaining to Volcanic Events

The City does not have specific codes, plans, or policies that pertain to volcanic events:

Please review Volume I, Section 2 for additional information on this hazard.

Wildfire

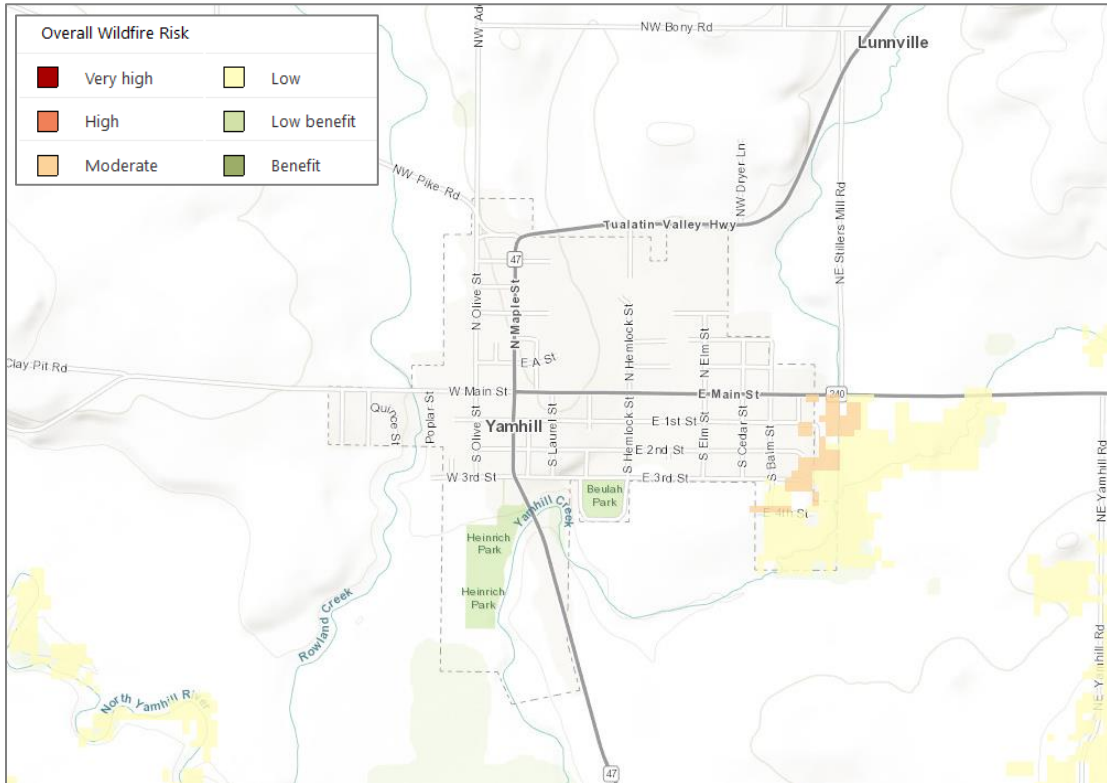
The steering committee determined that the City's probability for wildfire is **low** and that their vulnerability to wildfire is **moderate**.

The [Yamhill County Community Wildfire Protection Plan \(CWPP\)](#) was completed in August 2009 and revised in 2015. The CWPP is hereby incorporated into this NHMP addendum by reference, and it will serve as the wildfire section for this addendum.

Volume I, Section 2 describes the characteristics of wildland fire hazards, history, as well as the location, extent, and probability of a potential event within the region. The location, and extent of a wildland fire vary depending on fuel, topography, and weather conditions. Weather, and urbanization conditions are primarily at cause for the hazard level. Yamhill has not experienced a wildfire within City limits. The city is surrounded by irrigated agricultural

land. However, some wooded areas are a concern in the case of a wildfire event. Figure YA-8 shows overall wildfire risk in Yamhill.

Figure YA-8 Overall Wildfire Risk



Source: [Oregon Wildfire Risk Explorer](#), date accessed May 2, 2020.

There have been no wildfires in the City, however, several small wildfires have occurred west of the city in the regions near the city’s water treatment plant (Turner Creek Rd) and storage areas (NW Reservoir Rd). Wildland fires can be a problem in late summer to early fall and are usually caused by human activity (illegal brush burning, etc.).

The forested areas within, and surrounding Yamhill are interface areas. These areas (outside of the city) are characterized by varying housing structures (often large houses on small lots, some with shake roofs), irrigated agricultural land, natural, and ornamental vegetation, and topography that may increase the risk for wildfire spreading (particularly to the west, north, and northeast).

Most of the city has less severe (low to none) wildfire burn probability that includes expected flame lengths less than four feet under normal weather conditions.¹⁵ However, conditions vary widely and with local topography, fuels, and local weather (including wind) conditions. Under warm, dry, windy, and drought conditions expect higher likelihood of fire starts, higher intensity, more ember activity, and a more difficult to control wildfire that will include more fire effects and impacts.

¹⁵ [Oregon Wildfire Risk Explorer](#),

Yamhill's fire response is provided by Yamhill Fire District.

Vulnerability Assessment

Due to insufficient data and resources, Yamhill is currently unable to perform a quantitative risk assessment for this hazard.

The potential community impacts, and vulnerabilities described in Volume I, Section 2 are generally accurate for the City as well.

The CWPP assesses wildfire risk, maps wildland urban interface areas, and includes actions to mitigate wildfire risk (all identified actions are outside the city limits). However, several identified projects are located near the city or within the city's watershed including a high priority defensible space project at the Water Treatment Plant area and a moderate priority defensible space project along the access road to the reservoir. The City will update the City's wildfire risk assessment if the CWPP presents better data during future updates (an action item is included to participate in future updates to the CWPP).

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).

Exposed infrastructure including wastewater main lines, major water lines, natural gas pipeline and fiber optic lines are buried, decreasing their vulnerability to damage from wildfire hazards. However, wildfire conditions could potentially limit or delay access for the purposes of operation or repair.

Mitigation Activities

The Yamhill Fire District works to mitigate problems regarding wildfire issues when they arise. Wildfire mitigation activities listed here include current mitigation programs and activities that are being implemented by Yamhill agencies or organizations.

City of Yamhill Codes Pertaining to Wildfires

The following Yamhill codes, plans, and policies pertain to wildfires:

1. The City of Yamhill Development Code provides standards for public infrastructure and utilities, including design.
2. The City of Yamhill enforces the [Oregon Building Code](#) which regulates building material requirements and includes provisions for fire.
3. Yamhill County Community Wildfire Protection Plan.

Please review the [Yamhill County Community Wildfire Protection Plan \(CWPP\)](#) and Volume I, Section 2 for additional information on this hazard.

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ATTACHMENT A: ACTION ITEM FORMS

In the previous plan the City identified four high priority action items. These actions are those the city considered during the 2015-2020 Implementation and Maintenance period and they are listed in Table YA-8 along with their status.

Table YA-8 2015 High Priority Action Item Status

2014 Priority Action ID	Status (2020 Action ID) (Complete, Deferred, Deleted, Ongoing)	Comment	Description
Action #1	Completed	Part of Water System Master Plan	Develop water conservation plan for drought emergency
Action #2	Deferred (Multi-hazard #3)	Lack of funding resources	Coordinate installation of main power transfer switches, and backup power, for identified and prioritized critical facilities susceptible to short term power disruption. (i.e. gas station, shelters, food storage and service facilities, medical facilities, schools, correctional facilities, and water and sewage pump stations, etc.)
Action #3	Completed	Coordinate with County	Develop snow removal plan
Action #4	Deleted	Lack of funding, resources, coordinate with County/State	Clean flood prone waterways

Table YA-1 provide a summary list of 2020 NHMP Actions for the city. Each high priority action item has a corresponding action item worksheet describing the activity, identifying the rationale for the project, identifying potential ideas for implementation, and assigning coordinating and partner organizations. The action item worksheets can assist the community in pre-packaging potential projects for grant funding. The worksheet components are described below.

ALIGNMENT WITH EXISTING PLANS/POLICIES

The City NHMP includes a range of action items that, when implemented, will reduce loss from hazard events in the City. Within the plan, FEMA requires the identification of existing programs that might be used to implement these action items. The City addresses statewide planning goals and legislative requirements through its comprehensive land use plan, capital improvements plan, mandated standards and building codes. To the extent possible, the City will work to incorporate the recommended mitigation action items into existing programs and procedures. Each action item identifies related existing plans and policies.

STATUS/RATIONALE FOR PROPOSED ACTION ITEM

Action items should be fact-based and tied directly to issues or needs identified throughout the planning process. Action items can be developed at any time during the planning process and can come from several sources, including participants in the planning process, noted deficiencies in local capability, or issues identified through the risk assessment. The rationale for proposed action items is based on the information documented in this addendum and within Volume I, Section 2. The worksheet provides information on the activities that have occurred since the previous plan for each action item.

IDEAS FOR IMPLEMENTATION

The ideas for implementation offer a transition from theory to practice and serve as a starting point for this plan. This component of the action item is dynamic, since some ideas may prove to not be feasible, and new ideas may be added during the plan maintenance process. Ideas for implementation include such things as collaboration with relevant organizations, grant programs, tax incentives, human resources, education and outreach, research, and physical manipulation of buildings and infrastructure.

COORDINATING (LEAD) ORGANIZATION:

The coordinating organization is the public agency with the regulatory responsibility to address natural hazards, or that is willing and able to organize resources, find appropriate funding, or oversee activity implementation, monitoring and evaluation.

INTERNAL AND EXTERNAL PARTNERS:

The internal and external partner organizations listed in the Action Item Worksheets are potential partners recommended by the project steering committee but not necessarily contacted during the development of the plan. The coordinating organization should contact the identified partner organizations to see if they are capable of and interested in participation. This initial contact is also to gain a commitment of time and/or resources toward completion of the action items.

Internal partner organizations are departments within the City or other participating jurisdiction that may be able to assist in the implementation of action items by providing relevant resources to the coordinating organization.

External partner organizations can assist the coordinating organization in implementing the action items in various functions and may include local, regional, state, or federal agencies, as well as local and regional public and private sector organizations.

PLAN GOALS ADDRESSED:

The plan goals addressed by each action item are identified as a means for monitoring and evaluating how well the mitigation plan is achieving its goals, following implementation.

TIMELINE:

All broad scale action items have been determined to be ongoing, as opposed to short (0 to 2 years), medium (2-5 years), or long (6 or more years). This is because the action items are broad ideas, and although actions may be implemented to address the broad ideas, the efforts should be ongoing.

POTENTIAL FUNDING SOURCE

Where possible potential funding sources have been identified. Example funding sources may include: Federal Hazard Mitigation Assistance programs, state funding sources such as the Oregon Seismic Rehabilitation Grant Program, or local funding sources such as capital improvement or general funds. An action item may include several potential funding sources.

ESTIMATED COST

A rough estimate of the cost for implementing each action item is included. Costs are shown in general categories showing low, medium, or high cost. The estimated cost for each category is outlined below:

Low - Less than \$50,000

Medium - \$50,000 – \$100,000

High - More than \$100,000

Multi-Hazard #1

Proposed Action Item:		Alignment with Plan Goals:	
Distribute public education and information materials concerning mitigation, preparedness and safety procedures for identified natural hazards. Materials provided from other sources.		Gopal 1, Goal 2, Goal 3, Goal 6, Goal 8	
Alignment with Existing Plans/Policies:			
Community Wildfire Protection Plan			
2020 Status/Rationale for Proposed Action Item:			
<p>The natural hazard sections of the City's addendum (Volume II) to the Yamhill Co. NHMP and Yamhill County's risk assessment (Volume I, Section 2 and Volume III, Appendix C) identify vulnerable populations and property within the various identified hazard areas. Increasing public outreach to educate residents about their risk to natural hazards affecting their community as well as what to do in the event of a natural hazard will help decrease their vulnerability to natural hazards.</p> <p>The Disaster Mitigation Act of 2000 requires communities to identify how the community will continue to involve the public in the plan maintenance process [201.6(c)(4)(iii)]. Educating landowners on how to mitigate the effects of natural hazards helps keep the public informed of what is being done with the plan, how the City is working to mitigate its risk to natural hazards, and allows for feedback and suggestions from the public for improving, updating, and maintaining the plan.</p>			
Ideas for Implementation:			
<p>Distribution of natural hazard information describing dangers and evacuation routes for visitors to the City and continued educational outreach for residents and business owners.</p> <p>Update brochures with new information provided as part of reports provided by DOGAMI, ODF, DLCD, and FEMA (among others).</p> <p>Identify and use existing mechanisms for public outreach (e.g., SWCD, NRCS, watershed councils, OSU Extension, etc.).</p>			
Coordinating Organization:		City Hall	
Internal Partners:		External Partners:	
Public Works, Fire District, Police, School District, Planning		DOGAMI, DLCD, FEMA, ODF	
Potential Funding Sources:		Estimated cost:	Timeline:
General fund, grants		Low	<input type="checkbox"/> Short (0-2 years) <input type="checkbox"/> Medium (2-5 years) <input type="checkbox"/> Long (6+ years) <input checked="" type="checkbox"/> Ongoing
Form Submitted by:	2019-20 NHMP Steering Committee		
Priority:	High		

Multi-Hazard #2

Proposed Action Item:		Alignment with Plan Goals:	
Cross reference and incorporate mitigation planning provisions into all community planning processes such as comprehensive, capital improvement, land use, transportation plans, etc to demonstrate multi-benefit considerations and facilitate using multiple funding source consideration.		Goal 1, Goal 4, Goal 5, Goal 6, Goal 7, Goal 8	
Alignment with Existing Plans/Policies:			
Comprehensive Plan, Development Code, Building Code			
2020 Status/Rationale for Proposed Action Item:			
<p>Comprehensive plans provide the framework for the physical design of a community. They shape overall growth and development while addressing economic, environmental and social issues. Oregon's statewide goals are accomplished through local comprehensive plans. State Law requires local governments to adopt a comprehensive plan and the zoning and land-division ordinances needed to put the plan into action.</p> <p>Integration of NHMPs into comprehensive plans and other plans will help to reduce a community's vulnerability to natural hazards, support in mitigation activities, help to increase the speed in which action items are implemented and therefore the speed in which communities recover from natural disasters.</p> <p>Integration of NHMPs into local plans gives the action items identified in the NHMP legal status for guiding local decision-making regarding land use and/ or capital expenditures. .</p>			
Ideas for Implementation:			
<p>Conduct a policy crosswalk of the NHMP, the comprehensive plan, and other planning documents, to identify areas of possible integration.</p> <p>Integrate natural hazards information and policies into the comprehensive plan and other plans.</p> <p>Engage in collaborative planning and integration.</p> <p>Coordinate future NHMP and comprehensive plan reviews and updates.</p>			
Coordinating Organization:		Planning	
Internal Partners:		External Partners:	
Public Works, Administration		DLCD	
Potential Funding Sources:		Estimated cost:	Timeline:
General fund, DLCD Technical Assistance, utility rates		Low	<input type="checkbox"/> Short (0-2 years) <input checked="" type="checkbox"/> Medium (2-5 years) <input type="checkbox"/> Long (6+ years) <input type="checkbox"/> Ongoing
Form Submitted by:	2019-20 NHMP Steering Committee		
Priority:	High		

Earthquake #1

Proposed Action Item:		Alignment with Plan Goals:	
Conduct seismic strength evaluations of critical facilities and infrastructure to identify vulnerabilities and seismically retrofit (structural and nonstructural) identified critical facilities and infrastructure to meet life safety standards in order to continue operations post-earthquake.		Goal 2, Goal 3, Goal 4, Goal 6, Goal 7, Goal 8	
Alignment with Existing Plans/Policies:			
2020 Status/Rationale for Proposed Action Item:			
<p>Currently, all new facilities must comply with and meet seismic standards. If someone moves into an old building, they must upgrade to current standards.</p> <p>DOGAMI did a windshield survey of schools, fire stations, police, and city halls (2007 RVS). The focus was on action of existing buildings and information was shared with participants.</p>			
Ideas for Implementation:			
<p>Provide information to government building and school facility managers and teachers on nonstructural mitigation techniques including: securing bookcases, filing cabinets, light fixtures, and other objects that can cause injuries and block exits;</p> <p>Encourage facility managers, business owners, and teachers to refer to FEMA's practical guidebook: Reducing the Risks of Nonstructural Earthquake Damage;</p> <p>Encourage homeowners and renters to use Is Your Home Protected from Earthquake Disaster? A Homeowner's Guide to Earthquake Retrofit (IBHS) for economic and efficient mitigation techniques;</p> <p>Use the FEMA 154 seismic evaluations generated by DOGAMI to prioritize critical and essential buildings for upgrades;</p> <p>Explore partnerships to provide retrofitting classes for homeowners, renters, building professionals, and contractors; and</p> <p>Target development located in potential fault zones or in unstable soils for intensive education and retrofitting resources.</p>			
Coordinating Organization:		City Hall	
Internal Partners:		External Partners:	
School District, Fire District, Police, Public Works		DOGAMI	
Potential Funding Sources:		Estimated cost:	Timeline:
General funds, utility fees, grants (SRGP, HMA)		High	<input type="checkbox"/> Short (0-2 years) <input type="checkbox"/> Medium (2-5 years) <input checked="" type="checkbox"/> Long (6+ years) <input type="checkbox"/> Ongoing
Form Submitted by:	2019-20 NHMP Steering Committee		
Priority:	High		

Flood #3

Proposed Action Item:		Alignment with Plan Goals:	
Develop and maintain a GIS mapped inventory, and a prioritized list of critical facilities and residential and commercial buildings, within 100-year and 500-year floodplains.		Goal 1, Goal 3, Goal 4, Goal 6, Goal 8	
Alignment with Existing Plans/Policies:			
Comprehensive Plan			
2020 Status/Rationale for Proposed Action Item:			
<p>A comprehensive risk and vulnerability assessment is not available at this time. According to the most recent flood maps (3/2/2010) there are no residential or employment lands (commercial/industrial) that are within a mapped 100-year floodplain. However, there may be areas exposed to the 500-year flood and/or localized stormwater flooding. The city's sewage lagoons are in an area that is susceptible to flooding.</p> <p>The Disaster Mitigation Act of 2000 requires communities to identify actions and projects that reduce the effects of hazards on the community [201.6(c)(3)(ii)]. Mapping and identifying buildings exposed to special flood hazard areas will allow the city to better address flood mitigation and reduce risk. The Risk Mapping, Assessment, and Planning (Risk MAP) process would generate additional data on risks and vulnerabilities. The Risk Report would provide a quantitative risk assessment that would inform the City of their risks related to certain natural hazards (including flood). If pursued, once complete the city can incorporate the risk assessment into their addendum to provide greater detail to sensitivity and exposure to the flood hazard.</p>			
Ideas for Implementation:			
<p>Map the location of critical facilities, residences, and commercial buildings; coordinate with Yamhill County as appropriate.</p> <p>Coordinate with FEMA and Oregon Risk MAP coordinators to conduct a multi-hazard risk assessment (Risk MAP) including the flood hazard.</p> <p>Identify opportunities to upgrade Federal Insurance Rate Maps and arrange for Cooperative Technical Partnership mapping upgrades for select areas.</p>			
Coordinating Organization:		Public Works	
Internal Partners:		External Partners:	
Planning, City Hall, AKS Engineering		DOGAMI, Yamhill County, FEMA	
Potential Funding Sources:		Estimated cost:	Timeline:
General funds, utility fees, grants (FEMA CTP/Risk MAP)		Low (mapping of locations) to High (Risk Report)	<input type="checkbox"/> Short (0-2 years) <input checked="" type="checkbox"/> Medium (2-5 years) <input type="checkbox"/> Long (6+ years) <input type="checkbox"/> Ongoing
Form Submitted by:	2019-20 NHMP Steering Committee		
Priority:	High		

Flood #4

Proposed Action Item:		Alignment with Plan Goals:	
Develop and maintain an inventory of locations subject to frequent storm water flooding based on most current USACE/FEMA flood data.		Goal 1, Goal 3, Goal 4, Goal 6, Goal 8	
Alignment with Existing Plans/Policies:			
Comprehensive Plan			
2020 Status/Rationale for Proposed Action Item:			
<p>A comprehensive risk and vulnerability assessment of properties vulnerable to storm water flooding is not available currently. According to the most recent flood maps (3/2/2010) there are no residential or employment lands (commercial/industrial) that are within a mapped 100-year floodplain. However, there may be areas exposed to the 500-year flood and/or localized stormwater flooding. The city's sewage lagoons are in an area that is susceptible to flooding.</p> <p>The Disaster Mitigation Act of 2000 requires communities to identify actions and projects that reduce the effects of hazards on the community [201.6(c)(3)(ii)]. Mapping and identifying buildings exposed to stormwater flooding will allow the city to better address localized storm water floods and address necessary mitigation projects to reduce risk.</p>			
Ideas for Implementation:			
<p>Map the location of frequent storm water floods based on the most current data and maps (FIRMS 3/2/2010).</p> <p>Identify opportunities to upgrade Federal Insurance Rate Maps and arrange for Cooperative Technical Partnership mapping upgrades for select areas.</p>			
Coordinating Organization:		Public Works	
Internal Partners:		External Partners:	
Planning, City Hall, AKS Engineering		DOGAMI, Yamhill County, FEMA	
Potential Funding Sources:		Estimated cost:	Timeline:
General funds, utility fees, grants (CTP, Risk MAP)		Low (mapping of locations) to High (Risk Report)	<input type="checkbox"/> Short (0-2 years) <input checked="" type="checkbox"/> Medium (2-5 years) <input type="checkbox"/> Long (6+ years) <input type="checkbox"/> Ongoing
Form Submitted by:		2019-20 NHMP Steering Committee	
Priority:		High	

Severe Weather #3

Proposed Action Item:		Alignment with Plan Goals:	
Develop, implement, and maintain partnership program with electrical utilities to use underground utility placement methods where possible to reduce or eliminate power outages from severe winter storms.		Goal 2, Goal 3, Goal 4, Goal 6, Goal 8	
Alignment with Existing Plans/Policies:			
2020 Status/Rationale for Proposed Action Item:			
<p>Currently, all new facilities and infrastructure must comply with development standards including undergrounding.</p> <p>The Disaster Mitigation Act of 2000 requires communities to identify actions and projects that reduce the effects of hazards on the community [201.6(c)(3)(ii)]. Undergrounding electrical utility lines/infrastructure will decrease service interruptions during and after a hazard event.</p>			
Ideas for Implementation:			
<p>Develop, implement, and maintain partnership with electric utilities to underground existing utilities where and when possible.</p> <p>Consider possible incentives.</p> <p>Develop a tree clearing program to mitigate related threats to infrastructure, people, and property.</p>			
Coordinating Organization:		Public Works	
Internal Partners:		External Partners:	
Planning, Utilities, Property Owners		Oregon Energy Trust, Pacific Power	
Potential Funding Sources:		Estimated cost:	Timeline:
General funds, grants		Medium	<input type="checkbox"/> Short (0-2 years) <input type="checkbox"/> Medium (2-5 years) <input type="checkbox"/> Long (6+ years) <input checked="" type="checkbox"/> Ongoing
Form Submitted by:	2019-20 NHMP Steering Committee		
Priority:	High		

Wildfire #1

Proposed Action Item:		Alignment with Plan Goals:	
Coordinate wildfire mitigation action items through the Yamhill County Community Wildfire Protection Plan.		Goal 1, Goal 2, Goal 3, Goal 4, Goal 5, Goal 6, Goal 7, Goal 8	
Alignment with Existing Plans/Policies:			
Yamhill County Community Wildfire Protection Plan			
2020 Status/Rationale for Proposed Action Item:			
The wildfire mitigation action items provide direction on specific activities that organizations and residents in the City and Yamhill County can take to reduce wildfire hazards.			
Ideas for Implementation:			
Implement high and medium priority projects including defensible space and fuels reduction projects identified in the CWPP.			
Coordinating Organization:		Yamhill Fire District	
Internal Partners:		External Partners:	
City Hall		ODF	
Potential Funding Sources:		Estimated cost:	Timeline:
General fund, ODF grants		Medium	<input type="checkbox"/> Short (0-2 years) <input type="checkbox"/> Medium (2-5 years) <input type="checkbox"/> Long (6+ years) <input checked="" type="checkbox"/> Ongoing
Form Submitted by:	2019-20 NHMP Steering Committee		
Priority:	High		

ATTACHMENT B: PUBLIC INVOLVEMENT SUMMARY

Members of the steering committee provided edits and updates to the NHMP prior to the public review period as reflected in the final document.

To provide the public information regarding the draft NHMP addendum, and provide an opportunity for comment, an announcement (see text below) was announced on the county's website and an email contact was provided for public comment. Do to State mandated Coronavirus social distancing requirements, no in person public meetings were held.

During the public review period there were no comments provided.



The mission of Yamhill County Emergency Management is to provide a program that educates County residents in the Mitigation of, Preparedness for, Response to and Recovery from all hazards either natural or manmade.

Yamhill County seeks additional public input on update to Natural Hazard Mitigation Plan

(Posted July 14, 2020)

Yamhill County is currently in the process of updating their existing Natural Hazard Mitigation Plan (NHMP). This work is being performed in cooperation with the University of Oregon's Community Service Center - Oregon Partnership for Disaster Resilience and the Oregon Military Department's Office of Emergency Management utilizing funds obtained from the Federal Emergency Management Agency's (FEMA) Pre-Disaster Mitigation Grant Program. With re-adoption of the plan, Yamhill County will maintain its eligibility to apply for federal funding towards natural hazard mitigation projects. This local planning process includes a wide range of representatives from city and county government, emergency management personnel, and outreach to members of the public in the form of an electronic survey. This NHMP also affects the cities of Amity, Carlton, Dayton, McMinnville, Newberg, Sheridan, Willamina, and Yamhill.

A natural hazard mitigation plan provides communities with a set of goals, action items, and resources designed to reduce risk from future natural disaster events. Engaging in mitigation activities provides jurisdictions with a number of benefits, including reduced loss of life, property, essential services, critical facilities, and economic hardship; reduced short-term and long-term recovery and reconstruction costs; increased cooperation and communication within the community through the planning process; and increased potential for state and federal funding for recovery and reconstruction projects.

The electronic draft is available [here](#); to submit any comments or questions you have regarding the draft plan, please email Brian Young, Yamhill County Emergency Manager emergencymanagement@co.yamhill.or.us

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Volume III: Appendices

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APPENDIX A: ACTION ITEM FORMS

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Priority Action Item Forms

Each action item has a corresponding action item worksheet describing the activity, identifying the rationale for the project, identifying potential ideas for implementation, and assigning coordinating and partner organizations. The action item worksheets can assist the community in pre-packaging potential projects for grant funding. The worksheet components are described below.

ALIGNMENT WITH EXISTING PLANS/POLICIES

The Yamhill County multi-jurisdictional Natural Hazard Mitigation Plan includes a range of action items that, when implemented, will reduce loss from hazard events in the County. Within the plan, FEMA requires the identification of existing programs that might be used to implement these action items. Yamhill County currently addresses statewide planning goals and legislative requirements through its comprehensive land use plan, capital improvements plan, mandated standards and building codes. To the extent possible, Yamhill County will work to incorporate the recommended mitigation action items into existing programs and procedures. Each action item identifies related existing plans and policies.

STATUS/RATIONALE FOR PROPOSED ACTION ITEM

Action items should be fact-based and tied directly to issues or needs identified throughout the planning process. Action items can be developed at any time during the planning process and can come from several sources, including participants in the planning process, noted deficiencies in local capability, or issues identified through the risk assessment. The rationale for proposed action items is based on the information documented in Section 2. The worksheet provides information on the activities that have occurred since the previous plan for each action item.

IDEAS FOR IMPLEMENTATION

The ideas for implementation offer a transition from theory to practice and serve as a starting point for this plan. This component of the action item is dynamic, since some ideas may prove to not be feasible, and new ideas may be added during the plan maintenance process. Ideas for implementation include such things as collaboration with relevant

organizations, grant programs, tax incentives, human resources, education and outreach, research, and physical manipulation of buildings and infrastructure.

COORDINATING (LEAD) ORGANIZATION:

The coordinating organization is the public agency with the regulatory responsibility to address natural hazards, or that is willing and able to organize resources, find appropriate funding, or oversee activity implementation, monitoring and evaluation.

INTERNAL AND EXTERNAL PARTNERS:

The internal and external partner organizations listed in the Action Item Worksheets are potential partners recommended by the project HMAC but not necessarily contacted during the development of the plan. The coordinating organization should contact the identified partner organizations to see if they are capable of and interested in participation. This initial contact is also to gain a commitment of time and/or resources toward completion of the action items.

Internal partner organizations are departments within the County or other participating jurisdiction that may be able to assist in the implementation of action items by providing relevant resources to the coordinating organization.

External partner organizations can assist the coordinating organization in implementing the action items in various functions and may include local, regional, state, or federal agencies, as well as local and regional public and private sector organizations.

PLAN GOALS ADDRESSED:

The plan goals addressed by each action item are identified as a means for monitoring and evaluating how well the mitigation plan is achieving its goals, following implementation.

TIMELINE:

All broad scale action items have been determined to be ongoing, as opposed to short (0 to 2 years), medium (2-5 years), or long (6 or more years). This is because the action items are broad ideas, and although actions may be implemented to address the broad ideas, the efforts should be ongoing.

POTENTIAL FUNDING SOURCE

Where possible potential funding sources have been identified. Example funding sources may include: Federal Hazard Mitigation Assistance programs, state funding sources such as the Oregon Seismic Rehabilitation Grant Program, or local funding sources such as capital improvement or general funds. An action item may include several potential funding sources.

ESTIMATED COST

A rough estimate of the cost for implementing each action item is included. Costs are shown in general categories showing low, medium, or high cost. The estimated cost for each category is outlined below:

- Low - Less than \$50,000
- Medium - \$50,000 – \$100,000
- High - More than \$100,000

Multi-Hazard #1

Proposed Action Item		Alignment with Plan Goals:	
Develop, produce, and distribute public education and information materials concerning mitigation, preparedness and safety procedures for identified natural hazards.		Goal 1, Goal 2, Goal 3, Goal 6, Goal 8	
Alignment with Existing Plans/Policies:			
County Emergency Operations Plan, Natural Hazard Mitigation Plan			
2020 Status/Rationale for Proposed Action Item:			
<ul style="list-style-type: none"> • Yamhill County continues to participate in safety fairs throughout the county. • Each city sponsors workshops in conjunction with County Emergency Management. • The County's Manager continues to present at local and regional workshops, conferences, and fairs. • The Disaster Mitigation Act of 2000 requires communities to identify how the community will continue to involve the public in the plan maintenance process [201.6(c)(4)(iii)]. Educating the public on how to mitigate the effects of natural hazards helps keep the public informed of what is being done with the plan, how the County is working to mitigate its risk to natural hazards, and allows for feedback and suggestions from the public for improving, updating, and maintaining the plan. 			
Ideas for Implementation:			
<ul style="list-style-type: none"> • Distribution of natural hazard information describing dangers and evacuation routes for visitors and continue educational outreach for residents and business owners. • Distribute information about flood, fire, earthquake, and other forms of natural hazards insurance to property owners in areas identified to be at risk through hazard mapping; • Update brochures when new information is available. • Identify and use existing mechanisms for public outreach (e.g., SWCD, NRCS, watershed councils, OSU Extension, DOGAMI, DLCD, OCCRI, etc.). • Raise community awareness of water supply issues both during an emergency and long-term event by creating a community water resiliency education plan; implement an outreach plan. 			
Coordinating Organization:		Emergency Management	
Internal Partners:		External Partners:	
Public Health, Fire, Sheriff's Office		Local governments, DOGAMI, DLCD, OCCRI, FEMA	
Potential Funding Sources:		Estimated cost:	Timeline:
General Fund		Low	<input type="checkbox"/> Short (0-2 years) <input type="checkbox"/> Medium (2-5 years) <input type="checkbox"/> Long (6+ years) <input checked="" type="checkbox"/> Ongoing
Form Submitted by:	Existing Action Item, Revised 2020		
Priority:	High		

Multi-Hazard #5

Proposed Action Item		Alignment with Plan Goals:	
Develop public and private partnerships to foster natural hazard mitigation program coordination and collaboration in Yamhill County such as MOUs and CPODS etc.		Goal 1, Goal 2, Goal 3, Goal 6, Goal 8	
Alignment with Existing Plans/Policies:			
Debris Management Plan; County Emergency Operations Plan			
2020 Status/Rationale for Proposed Action Item:			
<ul style="list-style-type: none"> Utilize unique skills and equipment not available in public agencies in quantities needed for large scale response. 			
Ideas for Implementation:			
<ul style="list-style-type: none"> Identify all organizations within Yamhill County that have programs or interests in natural hazards mitigation; Involve private businesses throughout the county in mitigation planning; Improve communication between ODOT and county road departments, and work together to prioritize and identify strategies to deal with road problems; and Establish protocol for communication electric providers and the Department of Transportation and Development to assure rapid restoration of transportation capabilities. Develop a one-page handout on types of insurance and deliver through county utility or service agencies; Educate individuals and businesses on the benefit of engaging in mitigation activities such as developing impact analyses; Pinpoint areas of high risk and transfer the cost of risk to property owners through insurance (rather than to the public); Encourage the development of unifying organizations to ensure communication and dissemination of natural hazard mitigation information; and Identify activities for private sector and citizen involvement such as nonstructural seismic daycare retrofits. 			
Coordinating Organization:		Emergency Management	
Internal Partners:		External Partners:	
Public Health, Fire, Sheriff's Office		Realtors; Utility Providers; Property Owners	
Potential Funding Sources:		Estimated cost:	Timeline:
General Fund		Low	<input type="checkbox"/> Short (0-2 years) <input type="checkbox"/> Medium (2-5 years) <input type="checkbox"/> Long (6+ years) <input checked="" type="checkbox"/> Ongoing
Form Submitted by:	Existing Action Item, Revised 2020		
Priority:	High		

Multi-Hazard #6

Proposed Action Item		Alignment with Plan Goals:	
Develop a long-term recovery plan for Yamhill County from the effects of natural hazards.		Goal 1, Goal 3, Goal 4, Goal 6, Goal 7, Goal 8	
Alignment with Existing Plans/Policies:			
Comprehensive Plan, Emergency Operations Plan, Community Wildfire Protection Plan			
2020 Status/Rationale for Proposed Action Item:			
<ul style="list-style-type: none"> Developing a post-disaster recovery plan will improve the county's resilience to natural hazards (i.e. the ability to survive future natural disasters with minimum loss of life and property). Decisions taken in the heat of the emergency period immediately following a disaster often compromise significant opportunities to rebuild a safer community for the future. The pressure exerted by residents and property owners to have their disaster-stricken community rebuilt to its pre-disaster form and condition as quickly as possible remains a powerful factor in local, state, and federal emergency management to this day. There are ways to restrain such pressures and maintain mitigation and other post-disaster goals as high priorities during the process of long-term reconstruction even as the ashes, the rubble, and the water are receding or being cleared away. The secret lies in identifying in advance those decisions that will need to be made after a disaster that are most likely to have long-term repercussions for hazard mitigation. Pre-disaster and post-disaster mitigation should be two parts of a seamless whole in a sound plan for post-disaster recovery and reconstruction. The only difference is one of scale, of accelerating the pace with which existing mitigation plans are implemented, as a result of the influx of outside assistance. What is important about planning for post-disaster hazard mitigation is that the additional resources that facilitate hazard mitigation in the aftermath of a disaster do not materialize by accident. Local governments manage to secure such resources in large part because they have planned to do so. (Source: FEMA, "Policies for Guiding Planning for Post-Disaster Recovery and Reconstruction") 			
Ideas for Implementation:			
<ul style="list-style-type: none"> Designate a recovery management team that is empowered to monitor the process and implement the community's post-disaster recovery policies. This team should also serve as the post-disaster recovery planning team and can/should include persons involved in pre-disaster mitigation planning efforts. Involve a wide range of stakeholders and community leaders/volunteers. Discuss post-disaster recovery planning at future mitigation plan meetings. 			
Coordinating Organization:		Emergency Management	
Internal Partners:		External Partners:	
County Administration		Department of Geology and Mineral Industries, DLCD, FEMA, Yamhill cities and special districts	
Potential Funding Sources:		Estimated cost:	Timeline:
General fund, grants		Medium	<input checked="" type="checkbox"/> Short (0-2 years) <input type="checkbox"/> Medium (2-5 years) <input type="checkbox"/> Long (6+ years) <input type="checkbox"/> Ongoing
Form Submitted by:	Existing Action Item, Revised 2020		
Priority:	High		

Multi-Hazard #8

Proposed Action Item		Alignment with Plan Goals:	
Train elected officials and recorders in small towns who have no emergency management background on hazard mitigation needs.		Goal 1, Goal 2, Goal 3, Goal 8	
Alignment with Existing Plans/Policies:			
Emergency Operations Plan			
2020 Status/Rationale for Proposed Action Item:			
<ul style="list-style-type: none"> The Disaster Mitigation Act of 2000 requires communities to identify actions and projects that reduce the effects of hazards on the community [201.6(c)(3)(ii)]. Training elected official and recorders of hazard mitigation needs can assist the County, and cities, can lead to increased attention to natural hazards which may lead to new efforts to decrease community risk. 			
Ideas for Implementation:			
<ul style="list-style-type: none"> Coordinate with those local governments and special districts responsible for natural hazard mitigation and provide technical assistance, education, and outreach on all matters of emergency management and hazard mitigation. 			
Coordinating Organization:		Emergency Management	
Internal Partners:		External Partners:	
Administration		Department of Land Conservation and Development; Office of Emergency Management	
Potential Funding Sources:		Estimated cost:	Timeline:
General Fund, EMPG		Low	<input checked="" type="checkbox"/> Short (0-2 years) <input type="checkbox"/> Medium (2-5 years) <input type="checkbox"/> Long (6+ years) <input type="checkbox"/> Ongoing
Form Submitted by:	Existing Action Item, Revised 2020		
Priority:	High		

Earthquake #1

Proposed Action Item		Alignment with Plan Goals:	
Conduct seismic strength evaluations of critical facilities and infrastructure to identify vulnerabilities and seismically retrofit (structural and nonstructural) identified critical facilities and infrastructure to meet life safety standards in order to continue operations post-earthquake.		Goal 1, Goal 4, Goal 6, Goal 8	
Alignment with Existing Plans/Policies:			
Emergency Operations Plan			
2020 Status/Rationale for Proposed Action Item:			
<ul style="list-style-type: none"> • "For governments, less damage to government structures will mean continued services and normal processes or at least minimal interruptions. If government structures come through an earthquake with little or no damage, agencies will not have to relocate services, and public officials can respond to the immediate and long-term demands placed on them by the event. In short, seismic rehabilitation as a pre-event mitigation strategy actually will improve post-event response by lessening life loss, injury, damage, and disruption." Source: FEMA. Chapter 1: Why Seismic Rehabilitation? • DOGAMI conducted a seismic needs assessment for public school buildings, acute inpatient care facilities, fire stations, police stations, sheriffs' offices and other law enforcement agency buildings. Buildings were ranked for the "probability of collapse" due to the maximum possible earthquake for any given area. • Oregon Senate Bill 3 (2005) enables the Oregon Office of Emergency Management to develop a grant program to seismically rehabilitate critical public facilities. The Infrastructure Finance Authority oversees the state Seismic Rehabilitation Grant Program (SRGP). The existing DOGAMI inventory of critical facilities is available to assist communities. 			
Ideas for Implementation:			
<ul style="list-style-type: none"> • Inventory community buildings and infrastructure: determine which structures may be particularly vulnerable to earthquake damage. Seek funding to retrofit and/or re-build structures. • Create a local rehabilitation and retrofit program for existing buildings. • Explore options for including seismic retrofitting in existing programs such as low-income housing, insurance reimbursements, and pre- and post-disaster repairs. • Encourage owners of non-retrofitted reservoirs to upgrade them to meet seismic standards; and • Encourage all water providers to replace all old cast iron pipes with more ductile iron, and identify partnership opportunities with other agencies for pipe replacement. 			
Coordinating Organization:		Facilities	
Internal Partners:		External Partners:	
Emergency Management, Sheriff's Office, Planning, Public Works		Infrastructure Finance Authority, School districts, universities and colleges, utilities, water districts, Fire Districts	
Potential Funding Sources:		Estimated cost:	Timeline:
SRGP, HMA (PDM, HMGP)		High	<input type="checkbox"/> Short (0-2 years) <input type="checkbox"/> Medium (2-5 years) <input type="checkbox"/> Long (6+ years) <input checked="" type="checkbox"/> Ongoing
Form Submitted by:	Existing Action Item, Revised 2020		
Priority:	High		

Landslide #1

Proposed Action Item		Alignment with Plan Goals:	
Utilize the updated regional landslide risk maps (DOGAMI O-16-02) to identify hazard areas and collaborate with the Oregon Department of Geology and Mineral Industries to work on landslide risk reduction efforts; determine areas and buildings at risk to landslides and propose Comprehensive Plan and land use policies accordingly.		Goal 1, Goal 2, Goal 3, Goal 6, Goal 8	
Alignment with Existing Plans/Policies:			
Emergency Operations Plan, Comprehensive Plans, LiDAR data from DOGAMI			
2020 Status/Rationale for Proposed Action Item:			
<ul style="list-style-type: none"> The Landslide section of Yamhill County's risk assessment identified the potential for landslides to cause damage to buildings and infrastructure within the county; landslides may cause road closures and interruptions to utility services. The annex also identified previous incidents of landslides that affected the county. Road closures sometimes force residents to find alternate transportation routes. Reviewing and monitoring existing public infrastructure to identify specific exposure to landslide risk. The Disaster Mitigation Act of 2000 requires communities to identify actions and projects that reduce the effects of hazards on both new and existing buildings and infrastructure [201.6(c)(3)(ii)]. Identifying existing public infrastructure with exposure to landslide risk will allow the implementation of mitigation measures to reduce this risk. 			
Ideas for Implementation:			
<ul style="list-style-type: none"> Utilize the Landslide Susceptibility Map and Data (DOGAMI O-16-02) to perform landslide risk analysis. Use the new information to prioritize risk reduction actions. Perform risk reduction. Update/ develop Landslide Ordinances as applicable 			
Coordinating Organization:		Emergency Management	
Internal Partners:		External Partners:	
Planning, Public Works		DOGAMI, DLCD, USGS	
Potential Funding Sources:		Estimated cost:	Timeline:
SRGP, HMA (PDM, HMGP)		Medium	<input checked="" type="checkbox"/> Short (0-2 years) <input type="checkbox"/> Medium (2-5 years) <input type="checkbox"/> Long (6+ years) <input type="checkbox"/> Ongoing
Form Submitted by:	Existing Action Item, Revised 2020		
Priority:	High		

Wildfire #1

Proposed Action Item:		Alignment with Plan Goals:	
Coordinate wildfire mitigation action items through the Yamhill County Community Wildfire Protection Plan .		Goal 1, Goal 2, Goal 3, Goal 4, Goal 5, Goal 6, Goal 7, Goal 8	
Alignment with Existing Plans/Policies:			
Yamhill County Community Wildfire Protection Plan (2015)			
2020 Status/Rationale for Proposed Action Item:			
<ul style="list-style-type: none"> The goals of the CWPP include integration with the National Fire Plan, the Healthy Forests Restoration Act, and the Disaster Mitigation Act. The CWPP builds on and supplements the wildfire chapter of the Yamhill County Natural Hazards Mitigation Plan. The Yamhill County Community Wildfire Protection Plan (CWPP) was developed in 2009 and was last updated in 2015. The CWPP is a supplement this Natural Hazards Mitigation Plan. Critical to implementation of the CWPP are the identification and implementation of an integrated schedule of action items targeted at achieving a reduction in the number of human caused fires and the impact of wildland fires in Yamhill County. 			
Ideas for Implementation: CWPP Identified Focus Areas and Priority Actions			
<ul style="list-style-type: none"> The CWPP will be reviewed at least annually at special meetings of the planning committee, open to the public and involving all municipalities / jurisdictions, where action items, priorities, budgets, and modifications can be made or confirmed. During these meetings, participating jurisdictions will report on their respective projects and identify needed changes and updates to the existing plan. 			
Coordinating Organization:		Fire Defense Board	
Internal Partners:		External Partners:	
Emergency Management		Oregon Department of Forestry, U.S. Forest Service, U.S. Bureau of Land Management, public land management agencies	
Potential Funding Sources:		Estimated cost:	Timeline:
ODF, operating budgets		Low to High	<input type="checkbox"/> Short (0-2 years) <input type="checkbox"/> Medium (2-5 years) <input type="checkbox"/> Long (6+ years) <input checked="" type="checkbox"/> Ongoing
Form Submitted by:	New Action Item, 2020		
Priority:	High		

Wildfire #2

Proposed Action Item:		Alignment with Plan Goals:	
Improve fire identification data collection and reporting to enhance emergency response and evacuation procedures.		Goal 1, Goal 3, Goal 8	
Alignment with Existing Plans/Policies:			
Yamhill County Community Wildfire Protection Plan (2015)			
2020 Status/Rationale for Proposed Action Item:			
On-going program to educate residents on hazards and personal responsibilities to prepare for preventing fire. Clearly identifying home locations for responders to speed up response time and accuracy.			
Ideas for Implementation: CWPP Identified Focus Areas and Priority Actions			
<ul style="list-style-type: none"> • Work with active citizen groups (Firewise Communities, etc.) to sustain fire identification and education programs. • Emergency response and evacuation procedure information may be found on the National Fire Protection Association's website: https://www.nfpa.org/. 			
Coordinating Organization:		Fire Defense Board	
Internal Partners:		External Partners:	
Emergency Management		Oregon Department of Forestry, U.S. Forest Service, U.S. Bureau of Land Management, public land management agencies	
Potential Funding Sources:		Estimated cost:	Timeline:
ODF, operating budgets		Low	<input checked="" type="checkbox"/> Short (0-2 years) <input type="checkbox"/> Medium (2-5 years) <input type="checkbox"/> Long (6+ years) <input type="checkbox"/> Ongoing
Form Submitted by:	Existing Action Item, Revised 2020		
Priority:	High		

APPENDIX B: PLANNING AND PUBLIC PROCESS

NHMP Update Changes

This memo describes the changes made to the 2014 Yamhill County Multi-Jurisdictional Natural Hazard Mitigation Plan (NHMP) during the 2019-20 NHMP update process.

Project Background

Yamhill County and the cities of Amity, Dayton, McMinnville, Newberg, Sheridan, Willamina, and Yamhill partnered with the Oregon Partnership for Disaster Resilience (OPDR) to update the multi-jurisdictional 2014 Yamhill County NHMP. The Disaster Mitigation Act of 2000 requires communities to update their NHMPs every five years to remain eligible for Pre-Disaster Mitigation (PDM) program funding, Flood Mitigation Assistance (FMA) program funding, and Hazard Grant Mitigation Program (HMGP) funding. A Federal Emergency Management Pre-Disaster Mitigation grant funded the work with non-federal match provided by Yamhill County.

OPDR and the committees made several changes to the previous NHMP to consolidate and streamline the NHMP. The City of McMinnville addendum was added to this version of the NHMP. The cities of Dundee and Lafayette opted to not participate, as such their addenda was removed in this version of the NHMP.

Major changes are documented and summarized in this memo.

2019-20 NHMP Update Changes

The sections below only discuss *major* changes made to the NHMPs during the 2019-20 NHMP update process. Major changes include the replacement or deletion of large portions of text, changes to the NHMP's organization, new mitigation action items, the removal of the Dundee and Lafayette addenda, and the addition of the McMinnville addendum to the NHMP. If a section is not addressed in this memo, then it can be assumed that no significant changes occurred.

The NHMP's format and organization have been altered to fit within OPDR's NHMP templates. Table B-1 lists the 2014 Yamhill County NHMP section names and the corresponding 2020 section names, as updated (major Volumes are highlighted). This memo will use the 2020 NHMP update section names to reference any changes, additions, or deletions within the NHMP.

Table B-I Changes to Organization

2014 Yamhill County MNHMP	2020 Yamhill County MNHMP
-	Acknowledgements
Table of Contents	Table of Contents
C. Adoption Resolutions	Approval Letters and Resolutions
B. FEMA Review Tool	FEMA Review Tool
-	Volume I: Basic Plan
-	Plan Summary
1. Introduction; 3. Planning Process	Section 1: Introduction
4. Hazard Profiles; 5. Vulnerability Analysis; A. Figures (Maps)	Section 2: Hazard Identification and Risk Assessment
6. Mitigation Strategy	Section 3: Mitigation Strategy
8. Plan Maintenance	Section 4: Plan Implementation and Maintenance
7. Jurisdictional Addenda	Volume II: Jurisdictional Addenda
Yamhill County	[included within Volume I: Basic Plan]
City of Amity	City of Amity
City of Dayton	City of Dayton
City of Dundee	- (Did not participate in 2019-20 update)
City of Lafayette	- (Did not participate in 2019-20 update)
-	City of McMinnville
City of Newberg	City of Newberg
City of Sheridan	City of Sheridan
City of Willamina	City of Willamina
City of Yamhill	City of Yamhill
Volume IV: Appendices	Volume III: Appendices
-	Appendix A: Action Item Forms
3. Planning Process; D. Steering Committee Meetings; H. 2006 & 2009 Planning Processes	Appendix B: Planning and Public Process
2. Community Description	Appendix C: Community Profile
F. Benefit-Cost Analysis Information	Appendix D: Economic Analysis of Natural Hazard Mitigation Projects
-	Appendix E: Grant Programs and Resources
E. Public Outreach	Appendix F: Community Survey
I. Manmade and Technological Hazards	-
J. List of Acronyms and Abbreviations	-

As the table indicates the structure of the NHMP has changed significantly. Content and changes are described below.

Front Pages

1. The NHMP’s cover has been updated.
2. Acknowledgements have been added to include the 2019-20 project partners and planning participants.
3. The FEMA approval letter, review tool, and county resolutions of adoption are included.

Volume I: Basic Plan

Volume I provides the overall NHMP framework for the 2019-20 Multi-jurisdictional NHMP update. Volume I includes the following sections:

Plan Summary

The 2020 NHMP includes an updated NHMP summary that provides information about the purpose of natural hazard mitigation planning and describes how the NHMP will be implemented.

Section 1: Introduction

Section 1 introduces the concept of natural hazard mitigation planning and answers the question, “Why develop a mitigation plan?” Additionally, Section 1 summarizes the 2019-20 NHMP update process and provides an overview of how the NHMP is organized. Major changes to Section 1 include the following:

- Most of Section 1 includes new information that replaces out of date text found in the 2014 NHMP. The new text describes the federal requirements that the NHMP addresses and gives examples of the policy framework for natural hazards planning in Oregon.
- Section 1 of the 2020 update, outlines the entire layout of the NHMP update, which has been revised since the previous version of the plan as described above.

Section 2: Hazard Identification and Risk Assessment

This section consists of three phases: hazard identification, vulnerability assessment, and risk analysis. Hazard identification involves the identification of hazard geographic extent, its intensity, and probability of occurrence. The second phase attempts to predict how different types of property and population groups will be affected by the hazard. The third phase involves estimating the damage, injuries, and costs likely to be incurred in a geographic area over time. Changes include:

- The hazard and vulnerability information of the previous NHMP have been integrated into this section, Volume III Appendix C, and the city addenda within Volume II.
- Hazard identification, characteristics, history, probability, vulnerability, and hazard specific mitigation activities were updated. Outdated and extraneous information was removed and links to technical reports were added as a replacement. With this update the Oregon NHMP is cited heavily as a reference to the more technical hazard material.
- Links to specific hazard studies and data are embedded directly into the NHMP where relevant and available.
- NFIP information was updated.
- The hazard vulnerability analysis (Risk Assessment) has been updated for the county and cities (city information is included with more detail within Volume II). Technological/man-made hazard vulnerability is not included with this update.

Section 3: Mitigation Strategy

This section provides the basis and justification for the mission, goals, and mitigation actions identified in the NHMP. The 2014 mission and goals were evaluated by the county and city

Steering Committees and no changes were made. Major changes to the mitigation strategies (actions) include the following:

- **Technological and Manmade Hard Actions.** Only actions that are related to “natural hazards” were included in this update of the plan. As such, all actions listed under the categories of “Disruption of Utility and Transportation Systems”, “Hazardous Materials”, “Dam Failure”, or “Terrorism” were either removed or included in other actions.
- **Erosion Hazard Actions.** The erosion hazard was not profiled as a unique hazard with this update (see Volume I, Section 2). Actions related to erosion were included within applicable actions for flood or landslide.
- **Priority actions were evaluated, and new priorities were assigned.** Priority actions are provided an action item form within Volume III, Appendix A, and within each city addendum (Volume II) as Attachment A.
- **Actions evaluated for status and merit.** The County and City Steering Committees reviewed the previous actions and provided updates and edits to the actions where applicable. Including, the revision and consolidation of existing actions, lead and partners, timeframe, potential funding sources, and estimated cost. The previous plan included many actions that were determined to be obsolete, not mitigation related, or unrealistic and removed these actions from the NHMP. Furthermore, only actions that reflect current conditions and that are achievable were carried forward with this update. Prioritized actions are those that are achievable, high leverage activities over the next five-years and will receive each jurisdiction’s focus based on resource availability.
 - **County Actions.** The previous plan included 116 actions (7 prioritized), the 2019-2020 plan consolidated these actions into a list of 25 actions (8 prioritized). See Volume I, Section 3 and Volume III, Appendix A for more information and relevant mitigation activities. See Table B-2 for status of previous actions. 2020 actions are identified in blue rows, priority actions are identified in green rows.
 - **Amity Actions.** The previous plan included 70 actions (2 prioritized), the 2019-2020 plan consolidated these actions into a list of 24 actions (9 prioritized). See Volume II, *City of Amity Addendum* for more information and relevant mitigation activities.
 - **Carlton Actions.** The City of Carlton did not participate in the previous plan. During the 2019-2020 plan update the City reviewed actions listed in the first version of the plan (2009) and consolidated these actions into a list of 26 actions (6 prioritized). See Volume II, *City of Carlton Addendum* for more information and relevant mitigation activities.
 - **Dayton Actions.** The previous plan included 77 actions (3 prioritized), the 2019-2020 plan consolidated these actions into a list of 25 actions (5 prioritized). See Volume II, *City of Dayton Addendum* for more information and relevant mitigation activities.
 - **Dundee Actions.** The City of Dundee did not participate in the 2019-2020 planning process and their addendum and all actions were removed.
 - **Lafayette Actions.** The City of Lafayette did not participate in the 2019-2020 planning process and their addendum and all actions were removed
 - **McMinnville Actions.** The City of McMinnville did not participate in the previous plan. The 2019-2020 plan includes a list of 37 actions (11

prioritized). See Volume II, *City of McMinnville Addendum* for more information and relevant mitigation activities.

- **Newberg Actions.** The previous plan included 110 actions (3 prioritized), the 2019-2020 plan consolidated these actions into a list of 22 actions (5 prioritized). See Volume II, *City of Newberg Addendum* for more information and relevant mitigation activities.
- **Sheridan Actions.** The previous plan included 122 actions (3 prioritized), the 2019-2020 plan consolidated these actions into a list of 33 actions (8 prioritized). To be confirmed with city edits. See Volume II, *City of Sheridan Addendum* for more information and relevant mitigation activities.
- **Willamina Actions.** The previous plan included 96 actions (1 prioritized), the 2019-2020 plan consolidated these actions into a list of 26 actions (7 prioritized). To be confirmed with city edits. See Volume II, *City of Willamina Addendum* for more information and relevant mitigation activities.
- **Yamhill (City) Actions.** The previous plan included 96 actions (4 prioritized), the 2019-2020 plan consolidated these actions into a list of 25 actions (7 prioritized). See Volume II, *City of Yamhill Addendum* for more information and relevant mitigation activities.

Section 4: Plan Implementation and Maintenance

Yamhill County Emergency Management will continue to convene and coordinate the County Steering committee (Steering Committee). Documentation for the City Steering Committees is contained below and within the jurisdictional addenda in Volume II.

Volume II: Jurisdictional Addenda

The cities of Amity, Carlton, Dayton, Newbery, Sheridan, Willamina, and Yamhill opted to participate and update their 2014 city addenda. McMinnville developed their first addendum in this version of the NHMP. The cities of Dundee and Lafayette did not participate with this update. Several special districts participated in the County and City update process but opted to not be included with their own addendum with this update.

Where appropriate, information has been consolidated and a reference is provided within the addenda to the appropriate NHMP section. New data and hazard information was included for the participating cities and actions were reviewed, revised and prioritized as described in the addenda and Attachment A of each addendum.

Volume III: Appendices

Below is a summary of the changes to the appendices included in the 2020 NHMP:

Appendix A: Action Item Forms

County Action Item forms were developed for priority actions as noted in Volume I, Section 3 and Table B-2.

Appendix B: Planning and Public Process

This planning and public process appendix reflects changes made to the Yamhill County NHMP and documents the 2020 planning and public process.

Appendix C: Community Profile

The community profile has been updated to conform to the OPDR template and consolidates information for Yamhill County and cities. Additional community information is provided in each City addendum within Volume II.

Appendix D: Economic Analysis of Natural Hazard Mitigation Projects

This appendix provides an economic analysis of natural hazard mitigation projects and consolidates previous plan information into one appendix.

Appendix E: Grant Programs and Resources

This appendix is new and provides information on grant programs and resources.

Appendix F: Community Survey

This survey was conducted with the 2019-20 update of the NHMP and was utilized to inform the development of mitigation strategies and identification of community vulnerabilities. It is provided herein as documentation and to serve as a resource for future planning efforts.

Public Participation Process

Yamhill County is dedicated to directly involving the public in the review and update of the NHMP. Although members of the Steering committee represent the public to some extent, the residents of Yamhill County and participating cities were also given the opportunity to provide feedback about the NHMP. The NHMP will undergo review by the County NHMP Steering Committee on a semiannual basis and by the City Steering Committees on an annual basis.

Yamhill County made the NHMP available via the County website:

<https://www.co.yamhill.or.us/emergency-management>. City's also provided a copy of their addendum on their own websites. The draft NHMP was available for public review and comment through the FEMA review period.

Public Involvement Summary

A survey was provided to the public during the early stages of the update cycle (Volume III, Appendix G). Information from this survey was used by the Steering Committee to help inform their risk assessment and mitigation strategies.

During the County public review period (see next page) there were no comments provided. See jurisdictional addenda (Volume II) for city public involvement information.

Members of the Steering Committee provided edits and updates to the NHMP prior to the public review period as reflected in the final document.

Table B-2 2020 Yamhill County Mitigation Actions - Status

Hazard / Priority (2014 Action ID)	Status (2020 Action ID) (Complete, Deferred, Deleted, Ongoing)	Comment	Description
Natural Hazards			
Multi-Hazard (MH)			
Multi-Hazard	Ongoing (MH #1)	Priority Action. Description modified.	Develop, produce, and distribute <u>public education and information materials</u> concerning mitigation, preparedness and safety procedures for <u>identified all</u> natural hazards.
-	New (MH #2)		Incorporate Yamhill County Natural Hazard Mitigation Plan actions and goals in regulatory documents, e.g., Comprehensive Plan and the zoning code, and in existing plans, policies, or programs in the county that address natural hazards.
-	New (MH #10)		Promote and educate public on energy independence projects in neighborhoods and communities.
Multi-Hazard (14a)*	Deleted	Part of implementation and maintenance of the NHMP.	Review and update the Natural Hazards Mitigation Plan on an annual basis. Conduct a complete review of the plans and have then officially promulgated by the BOC every five years.
Multi-Hazard (14b)*	Deleted	Not mitigation.	Review and update the Yamhill County Emergency Operations Plan on an annual basis. Conduct a complete review of the plans and have then officially promulgated by the BOC every five years.
Multi-Hazard (1)	Deleted	Part of plan update process.	Provide assistance to incorporated communities and special districts in development of Natural Hazards Mitigation Plans.
Multi-Hazard (2)	Deleted	Not mitigation.	Consider the goals and action items from the Yamhill County Natural Hazard Mitigation Plan for implementation in other county documents and programs, where appropriate.
Multi-Hazard (3)	Deleted	Not mitigation. See MH #2 (2020).	Evaluate the effectiveness of existing programs and identify shortcomings in natural hazard mitigation. Balance the objectives of program goals with natural hazard mitigation.
Multi-Hazard (4)	Deleted	Part of implementation and maintenance of the NHMP.	Utilize new part-time County grant writer to identify funding opportunities for developing and implementing local and county mitigation activities. Identify potential County funding sources such as: general fund, transportation fund, etc. for all ongoing mitigation actions.

Hazard / Priority (2014 Action ID)	Status (2020 Action ID) (Complete, Deferred, Deleted, Ongoing)	Comment	Description
Multi-Hazard (5)	Deleted	Part of implementation and maintenance of the NHMP.	Develop a process for the Yamhill County Natural Hazards Mitigation Plan Steering Committee to assist in implementing, monitoring, and evaluating countywide mitigation activities.
Multi-Hazard (6)	Ongoing (MH #3)	Description modified.	Use DOGAMI Corridor study to identify the effects of each natural hazard on priority transportation routes to and from critical facilities, such as emergency facilities and first responder sites. Determine the impact that of each natural hazard could have on priority transportation routes to and from critical facilities, such as emergency facilities and first responder sites. DOGAMI corridor study is in progress
Multi-Hazard (7)	Ongoing (MH #4)	Description modified.	Participate in Identify collaborative and related programs that recognize ways to decrease the risks of natural hazards such as including FEMA FLIP and FIRM.
Multi-Hazard (8)	Ongoing (MH #5)	Priority Action.	Develop public and private partnerships to foster natural hazard mitigation program coordination and collaboration in Yamhill County such as MOUs and CPODS etc.
Multi-Hazard (9)	Completed	Through Planning department	Develop GIS inventories of essential facilities, at-risk buildings and infrastructure, and prioritize mitigation projects.
Multi-Hazard (10)	Deleted	Modified during 2014 NHMP update process.	Strengthen emergency services preparedness and response by linking emergency services with natural hazard mitigation programs, and enhance public education on a regional scale. Develop, enhance, and implement education programs aimed at mitigating natural hazards and reducing the risk to citizens, public agencies, private property owners, businesses, and schools. Sustain a public awareness campaign about natural hazards.
Multi-Hazard (11)	Deleted	Modified during 2014 NHMP update process. Part of MH #1 (2020)	Develop, enhance, and implement education programs aimed at mitigating natural hazards and reducing the risk to citizens, public agencies, private property owners, businesses, and schools
Multi-Hazard (12)	Deleted	Modified during 2014 NHMP update process. Part of MH #1 (2020)	Sustain a public awareness campaign about natural hazards.
Multi-Hazard (13)	Completed	Not mitigation. All cities in Yamhill Co have EOPs	Sustain an education and outreach program for local jurisdictions and assist them in developing emergency operations, public information and hazard mitigation plans.

Hazard / Priority (2014 Action ID)	Status (2020 Action ID) (Complete, Deferred, Deleted, Ongoing)	Comment	Description
Multi-Hazard (15)	Completed	Not mitigation. On the county website	Make the Yamhill County Emergency Operations Plan and the Natural Hazards Mitigation Plan, and other resources on hazard planning /mitigation available to the public electronically.
Multi-Hazard (16)	Completed	Included in code	Promote hazard resistant utility construction and maintenance methods.
Multi-Hazard (17)	Deleted	Part of implementation and maintenance of the NHMP.	Develop a system for data collection for undeclared natural hazard events.
Multi-Hazard (18)	Ongoing (MH #6)	Priority Action. Description modified	Improve coordination of and evaluate technical and engineering gaps in response service for natural hazard events. Develop a long-term recovery plan for Yamhill County from the effects of natural hazards.
Multi-Hazard (19)	Delete	Deleted during 2014 NHMP update process.	Identify potential County funding sources such as: general fund, transportation fund, etc. for all ongoing mitigation actions.
Multi-Hazard (20)	Complete	System is in place.	Provide public alert and warning system.
Multi-Hazard (21)	Ongoing (MH #7)	Description modified	Update jurisdictional debris management plan to include provisions for winter storm and windstorm. Update should include labor & equipment tracking protocols for disaster assessment data collection.
Multi-Hazard (22)	Deleted	Part of current operations.	Develop labor & equipment tracking protocols for NH damage/disaster assessment information gathering.
Multi-Hazard (23)	Completed	Part of normal NHMP update process.	Steering Committee to prioritize Natural Hazard Mitigation Plan
Multi-Hazard (24)	Ongoing (MH #9)	ODOT report identified in Section 2 and App. C.	Determine critical bridge infrastructure – lifeline routes – water, sewer, power
Multi-Hazard (25)	Deleted	Part of current operations.	Review, Assessment of Sewage Infrastructure
Multi-Hazard (26)	Deleted	Not mitigation.	Build a cadre of community volunteers to form an Emergency Preparedness Speakers Bureau
Flood			
Flood (ST1)	Deleted	Part of MH #1 (2020)	Develop better flood warning systems to communicate with the public.

Hazard / Priority (2014 Action ID)	Status (2020 Action ID) (Complete, Deferred, Deleted, Ongoing)	Comment	Description
Flood (ST2)	Completed during 2014 NHMP update.	Inventory maintained by Oregon Water Resources Department.	Maintain an inventory of all permitted dams built for flood control purposes in the county.
Flood (ST3)	Deferred (FL #1)	Lack funding and capacity. Description modified	Implement, and maintain the steps needed for Yamhill County to become a participant in the NFIP's Community Rating System and seek to improve the County's rating.
Flood (LT1)	Deleted	Part of FL #2 (2020)	Update and improve the FIRM maps for Yamhill County as funding becomes available.
Flood (LT2)	Deferred (FL #2)	Attempted in 2019, not funded.	Coordinate with DOGAMI and DLCD to enhance data and mapping for floodplain information in the county. and Identify and map flood prone areas outside of designated floodplains.
Flood (LT3)	Ongoing (MH #8)	Efforts ongoing. Priority Action.	Seek funding to Train elected officials and recorders in small towns who have no emergency management background on hazard mitigation needs.
Flood (LT4)	Deleted	Part of MH #1 (2020)	Provide flood event education and outreach to households and businesses.
Flood (LT5)	Ongoing (FL #3)	Upgraded per CIP. Description modified.	Seek funding to Retrofit culverts in Yamhill County with pipes designed for 50 to 100- year flood intervals.
Flood (LT6)	Deleted	Part of FL #2	Coordinate with Yamhill SWCD, DOGAMI and NOAA to identify funding sources for further study of the gravel accumulations in the Willamette River at Lambert Bend.
Flood (LT7)	Ongoing (FL #4)	Participating in NFIP. No RL properties mitigated.	Ensure continued compliance in the NFIP through enforcement of local flood plain management ordinances. Mitigate repetitive flood loss properties as applicable.
Winter Storms			
Winter Storms	Completed	Part of MH #7	Update, develop, implement, and maintain jurisdictional debris management plans.
Winter Storms (LT2)	Completed	Part of normal operations.	Improve weather monitoring to attain earlier severe winter storm warnings and send notifications to responders and public.
Winter Storms (ST1)	Completed	Part of MH #7	Develop and implement or enhance strategies for debris management due to severe winter storms. Need to include labor & equipment tracking protocols for efficient disaster assessment information gathering.

Hazard / Priority (2014 Action ID)	Status (2020 Action ID) (Complete, Deferred, Deleted, Ongoing)	Comment	Description
Winter Storms (ST2)	Completed	Part of normal operations.	Develop and implement programs to coordinate maintenance and mitigation activities to reduce risk to public infrastructure from severe winter storms.
Winter Storms (ST3)	Completed	Part of implementation and maintenance, normal operations.	Seek funding to acquire necessary emergency back-up power systems for all RFPD facilities and other identified critical facilities.
Winter Storms (LT1)	Deleted	Part of MH #1 (2020)	Increase public awareness of severe winter storms and the benefits of mitigation activities through education aimed at households and businesses and increase targeting of vulnerable populations.
Winter Storms (LT3)	Deleted	Part of SW #1 (2020)	Develop and implement programs to keep trees from threatening lives, property, and public infrastructure as a result of severe weather events.
Winter Storms (LT4)	Completed	Part of normal operations	Develop and maintain comprehensive impact database and, when possible, map and publicize historical severe weather events in Yamhill County.
Winter Storms (LT5)	Completed	Part of normal operations	Support/encourage electrical utilities through public incentives/ partnerships to use underground construction methods where possible to reduce power outages from severe winter storms.
Winter Storms (LT6)	Completed	Part of normal operations	Promote the benefits of tree-trimming and tree replacement programs and help coordinate local efforts by public and private agencies.
Winter Storms (LT8)	Completed	Part of normal operations	Encourage right-of-way coordination, education and management between property owners, utility operators, and government agencies.
Winter Storms (LT9)	Completed	Part of normal operations	Encourage harvesting of trees that are blown down during a winter storm.
Landslide			
Landslide (ST1)	Ongoing (LS #1)	Description modified. DOGAMI published a Landslide Susceptibility Report in 2016 (O-16-02).	<u>Utilize the updated regional landslide risk maps (DOGAMI O-16-02) to identify hazard areas and collaborate with the Oregon Department of Geology and Mineral Industries to work on landslide risk reduction efforts; determine areas and buildings at risk to landslides and propose Comprehensive Plan and land use policies accordingly.</u> Improve knowledge of landslide hazard areas and understanding of vulnerability and risk to life and property in hazard-prone areas.

Hazard / Priority (2014 Action ID)	Status (2020 Action ID) (Complete, Deferred, Deleted, Ongoing)	Comment	Description
Landslide (ST2)	Ongoing (LS #2)	Part of code.	Encourage construction, site location and design that can be applied to steep slopes to reduce the potential threat of landslides.
Landslide (ST3)	Completed	Part of EOP.	Identify safe evacuation routes in high-risk debris flow and landslide areas.
Landslide (ST4)	Deleted	Part of LS #1 (2020)	Compile relative landslide risk maps for Yamhill County.
Landslide (ST5)	Deleted	Part of MH #1 (2020)	Increase public education related to landslide hazards by distributing DOGAMI landslide informational brochure
Landslide (LT1)	Deleted	Part of EOP.	Evaluate current landslide warning systems to ensure effectiveness and efficiency. Increase coordination between local jurisdictions, emergency responders, homeowners, and ODF
Landslide (LT2)	Deleted	Part of MH #1 (2020)	Mitigate activities in identified potential and historical landslide areas through public outreach.
Landslide (LT3)	Deleted during 2014 NHMP update process.	Combined with LT1 (2014)	Increase coordination between local jurisdictions, emergency responders, homeowners and ODF for landslide warning systems.
Landslide (LT4)	Deleted	Part of LS #1 (2020)	Investigate the development and implementation of a county landslide ordinance.
Landslide (LT5)	Deleted	Part of LS #1 (2020)	Protect existing development in landslide-prone areas.
Landslide (LT6)	Deleted during 2014 NHMP update process.	Part of FL #3 (2020)	Maintain public and private drainage systems
Wildland/Urban Conflagrations			
Wildland/Urban Conflagration (LT5)	Deleted	Part of MH #5 (2020). Activity of CWPP	Maintain and further develop interagency and private industry relationships for continuing strong fire response in Yamhill County.
Wildland/Urban Conflagration (ST1)	Deleted	Activity of CWPP	Work with the Yamhill Fire Defense Board in the review of plans and inspection of structures, access and water supply for fire code compliance.
	New (WF #1)		Coordinate wildfire mitigation action items through the Yamhill County Community Wildfire Protection Plan.
Wildland/Urban Conflagration (ST2)	Ongoing (WF #2)	CWPP created. Description modified.	Coordinate with ODF to regularly update and maintain the Develop a Community Wildfire Protection Plan for susceptible urban/wildland interface areas in Yamhill County.

Hazard / Priority (2014 Action ID)	Status (2020 Action ID) (Complete, Deferred, Deleted, Ongoing)	Comment	Description
Wildland/Urban Conflagration (ST3)	Ongoing		Advocate water storage facilities with fire resistant electrical pump systems in developments not connected to a community water/hydrant system.
Wildland/Urban Conflagration (ST4)	Deleted	Part of MH #1 (2020); Activity of CWPP	Continue to promote public awareness campaigns for individual property owners living in the wildland/urban interface (WUI).
Wildland/Urban Conflagration (ST5)	Ongoing (WF #3)	Description modified; Activity of CWPP	Conduct regular Seek funding and labor opportunities to staff fuel-reduction projects throughout wildfire hazard-prone areas in Yamhill County.
Wildland/Urban Conflagration (ST6)	Deleted	Part of WF #3 (2020). Activity of CWPP	Create incentives and assist landowners in reducing fuel loads on private property.
Wildland/Urban Conflagration (ST7)	Deleted	Part of MH #5 (2020). Activity of CWPP	Increase communication, coordination and collaboration between wildland/urban interface property owners, city and county planners, and fire prevention crews and officials to address inherent risks in wildland/urban interface areas, existing mitigation (prevention/protection) measures, and federal mitigation assistance programs.
Wildland/Urban Conflagration (ST8)	Ongoing (WF #4)	Description modified. See CWPP.	Improve fire identification data collection and reporting to enhance emergency response and evacuation procedures. Seek improved information gathering and distribution and technology for enhancing fire identification, initial response and evacuation if necessary.
Wildland/Urban Conflagration (ST9)	Completed	Part of normal operations; Activity of CWPP	Enhance emergency services to increase the efficiency of wildfire response and recovery activities.
Wildland/Urban Conflagration (ST10)	Deleted	Activity of CWPP; part of NHMP implementation and maintenance	Educate agency personnel on federal cost-share and grant programs, fire protection agreements, and other related federal programs so the full array of assistance available to local agencies is understood.
Wildland/Urban Conflagration (ST11)	Ongoing	Activity of CWPP; description modified	Identify funding for and Develop an inventory of alternative firefighting water sources and encourage the development of additional sources.
Wildland/Urban Conflagration (ST12)	Ongoing	Activity of CWPP; description modified	Identify funding for and Develop an inventory of firefighting hardware to be better prepared when attacking wildfires. (Resource inventory is complete)

Hazard / Priority (2014 Action ID)	Status (2020 Action ID) (Complete, Deferred, Deleted, Ongoing)	Comment	Description
Wildland/Urban Conflagration (LT1)	Completed during the 2014 NHMP update process.	Activity of CWPP	Promote the expansion of rural fire districts.
Wildland/Urban Conflagration (LT2)	Deleted	Activity of CWPP	Look for solutions to protect structures located outside of fire districts through partnerships, grant funding or expansion of fire district services such as ODF.
Wildland/Urban Conflagration (LT3)	Deleted during the 2014 NHMP update process	Duplicate of ST6; Activity of CWPP	Reduce wildfire fuels.
Wildland/Urban Conflagration (LT4)	Deleted during the 2014 NHMP update process	Duplicate of ST6; Activity of CWPP	Promote and continue support of agricultural uses that reduce fuel loads in WUI areas.
Wildland/Urban Conflagration (LT6)	Deleted	Part of MH #1 (2020); Activity of CWPP	Seek funding to develop and implement or enhance existing outreach and education programs aimed at mitigating wildfire hazards and reducing or preventing the exposure of citizens, public agencies, private property owners, and businesses to natural hazards.
Wildland/Urban Conflagration (LT7)	Deleted	Part of MH #1 (2020); Activity of CWPP	Encourage development and dissemination of maps relating to fire hazards to help educate and assist builders and homeowners in being engaged in wildfire mitigation activities, and to help guide emergency services during response.
Wildland/Urban Conflagration (LT8)	Deleted	Part of WF #3 (2020); Activity of CWPP	Encourage implementation of wildfire mitigation activities consistent with the goals of promoting sustainable ecological management and community stability.
Earthquake			
Earthquake (LT4)	Deleted	Not mitigation. Part of MH #1 (2020).	Encourage earthquake safety promotion and drills to community groups
Earthquake (ST1)	Deleted	Part of NHMP update planning process.	Integrate new earthquake hazard mapping data for Yamhill County and improve technical analysis of earthquake hazards.
Earthquake (ST2)	Deleted during 2014 NHMP update process	Accomplished through building codes. Part of MH #1 (2020).	Encourage reduction of nonstructural and structural earthquake hazards in homes, schools, businesses, and government offices.

Hazard / Priority (2014 Action ID)	Status (2020 Action ID) (Complete, Deferred, Deleted, Ongoing)	Comment	Description
Earthquake (ST3)	Deleted	Part of MH #1 (2020).	Encourage purchase of earthquake hazard insurance by forming partnerships with the insurance and real estate industries.
Earthquake (ST4)	Deleted during 2014 NHMP update process	(duplicate; same as FL2)	Maintain an inventory of all permitted dams in Yamhill County
Earthquake (ST5)	Ongoing (EQ #1)	Description modified. Priority Action.	Conduct seismic strength evaluations of critical facilities and infrastructure to identify vulnerabilities and seismically retrofit (structural and nonstructural) identified critical facilities and infrastructure to meet life safety standards in order to continue operations post-earthquake. Identify funding sources for and implement high priority structural and nonstructural retrofits of structures that are identified as seismically vulnerable.
Earthquake (LT1)	Completed	Part of MH #1 (2020) & normal operations.	Promote and continue building code standards.
Earthquake (LT2)	Deleted	Combined into EQ #1 (2020).	Encourage seismic strength evaluations of critical facilities to identify vulnerabilities and to meet current seismic standards.
Earthquake (LT3)	Deleted during 2014 NHMP update process	Not the County's area of responsibility (AOR)	Identify and enhance water, sewer, electric, gas and other utilities to improve their survivability in an earthquake.
Earthquake (LT5)	Deleted	Combined into EQ #1 (2020).	Improve local capabilities to perform earthquake building safety evaluations to conduct pre- and post-disaster assessments.
Earthquake	Completed	Part of MH #1 (2020) & normal operations.	Disseminate FEMA pamphlets to educate and encourage homeowners concerning seismic structural and non-structural retrofit benefits.
Wind			
Wind (LT10)	Deleted	Part of MH #1 (2020)	Increase and maintain public awareness of severe windstorms and the benefits of mitigation activities through education aimed at households and businesses.
Wind (ST1)	Ongoing (SW #1)	Description modified	<u>Develop and implement programs to coordinate maintenance and mitigation activities to reduce risk to public infrastructure from severe weather (windstorms and winter storms).</u> Develop and implement programs to keep trees

Hazard / Priority (2014 Action ID)	Status (2020 Action ID) (Complete, Deferred, Deleted, Ongoing)	Comment	Description
			from threatening lives, property and public infrastructure during windstorm events.
Wind (ST2)	Deleted during 2014 NHMP update process	Part of MH #7 (2020)	Develop and implement or enhance strategies for debris management and/or removal after windstorm events.
Wind (ST3)	Deleted during 2014 NHMP update process	Duplicated in ST1. Part of SW #1 (2020)	Maintain tree trimming for aboveground power lines.
Wind (LT1)	Deleted	Part of MH #1; Lack funding and staff availability	Map and publicize locations around Yamhill County with the highest incidence of extreme windstorms.
Wind (LT2)	Completed	Part of normal operations	Support/encourage electrical utilities to use underground construction methods where possible to reduce power outages from windstorms.
Wind (LT3)	Deleted	Part of MH #1 (2020)	Increase public awareness of windstorm mitigation activities.
Wind (LT4)	Completed	Part of normal operations	Support/encourage contractors, homeowners and electrical utilities to use windstorm resistant construction methods where possible to reduce damage and power outages from windstorms.
Wind (LT5)	Deleted	Duplicated in ST1. Part of SW #1 (2020)	Develop and implement programs to keep trees from threatening lives, property and public infrastructure during windstorm events.
Wind (LT6)	Deleted	Part of SW #1	Identify trees that are potentially susceptible to wind throw.
Wind (LT7)	Completed	Part of normal operations	Encourage all identified critical facilities to secure emergency power.
Wind (LT8)	Completed	Part of normal operations	Encourage harvesting of trees along utility and road corridors, preventing potential windstorm damage.
Wind (LT9)	Completed	Part of normal operations	Encourage harvesting of trees that are blown down during a windstorm.
Drought			
Drought	Ongoing (DR #1)	Description modified.	Encourage coordination among municipalities for water issues, <u>such as inter-tied water systems and local water storage to mitigate drought.</u>

Hazard / Priority (2014 Action ID)	Status (2020 Action ID) (Complete, Deferred, Deleted, Ongoing)	Comment	Description
Drought (ST1)	Deleted	Part of DR #1 (2020)	Support the technical services provided by county-based agencies on effective methods of water use curtailment.
Drought (ST2)	Deleted	Part of DR #1 (2020)	Encourage local governments to Inter-tie water systems. (studies done in 1997 and 2009)
Drought (LT1)	Completed	Part of normal operations.	Support Soil and Water Conservation District and local water agencies' training on water conservation measures to farmers and ranchers, including drought management practices for crops and livestock.
Drought (LT2)	Deleted during 2014 NHMP update process	Lack funding and staff availability.	Support the technical service and low interest loans provided to farmers and ranchers so that they can develop livestock watering systems.
Drought (LT3)	Deleted	Part of DR #1 (2020)	Encourage storage of water, especially off stream storage.
Drought (LT4)	Deleted	Part of DR #1 (2020)	Support agencies' determination of locations for additional aquifer studies that might lead to greater water supplies and help determine funding sources for the studies.
Volcano			
Volcano	Deleted	Will be resolved when iPAWS capable for ALL-hazards	Update public emergency notification procedures and develop an outreach program for ash fall events.
Erosion			
Erosion	Deleted	Part of MH #1 (2020)	Develop and provide information to citizens on riverbank erosion and methods to prevent it in an easily distributed format.

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Press Release

Placed on County Website on July 14, 2020

<https://www.co.yamhill.or.us/emergency-management>



The mission of Yamhill County Emergency Management is to provide a program that educates County residents in the Mitigation of, Preparedness for, Response to and Recovery from all hazards either natural or manmade.

Yamhill County seeks additional public input on update to Natural Hazard Mitigation Plan

(Posted July 14, 2020)

Yamhill County is currently in the process of updating their existing Natural Hazard Mitigation Plan (NHMP). This work is being performed in cooperation with the University of Oregon's Community Service Center - Oregon Partnership for Disaster Resilience and the Oregon Military Department's Office of Emergency Management utilizing funds obtained from the Federal Emergency Management Agency's (FEMA) Pre-Disaster Mitigation Grant Program. With re-adoption of the plan, Yamhill County will maintain its eligibility to apply for federal funding towards natural hazard mitigation projects. This local planning process includes a wide range of representatives from city and county government, emergency management personnel, and outreach to members of the public in the form of an electronic survey. This NHMP also affects the cities of Amity, Carlton, Dayton, McMinnville, Newberg, Sheridan, Willamina, and Yamhill.

A natural hazard mitigation plan provides communities with a set of goals, action items, and resources designed to reduce risk from future natural disaster events. Engaging in mitigation activities provides jurisdictions with a number of benefits, including reduced loss of life, property, essential services, critical facilities, and economic hardship; reduced short-term and long-term recovery and reconstruction costs; increased cooperation and communication within the community through the planning process; and increased potential for state and federal funding for recovery and reconstruction projects.

The electronic draft is available [here](#); to submit any comments or questions you have regarding the draft plan, please email Brian Young, Yamhill County Emergency Manager emergencymanagement@co.yamhill.or.us

Yamhill County Steering committee

Steering Committee members possessed familiarity with the Yamhill County community and how it's affected by natural hazard events. The Steering Committee guided the update process through several steps including 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. The Steering Committee met formally on the following dates:

Meeting #1: Kickoff, July 18, 2019

During this meeting, the Steering Committee reviewed the previous NHMP, and were provided updates on hazard mitigation planning, the NHMP update process, and project timeline. They also provided updates on the history of hazard events in the county and cities, reviewed and revised the NHMP's mission and goals, and discussed progress made toward the previous NHMP's action items.

Meeting #2: Risk Assessment and Actions, August 21, 2019

During this meeting, the Steering Committee reviewed the existing risk assessment including community vulnerabilities and hazard information. Information obtained during this meeting was used to inform the update of the hazard analysis. The Steering Committee also started their review of their existing mitigation strategy (actions) and provided status updates.

Meeting #3: Risk Assessment and Actions, August 21, 2019

The Steering Committee completed their review of their existing mitigation strategy (actions) and created a list of high priority action items. The previous NHMP's implementation and maintenance program was reviewed and any changes that were necessary were made as indicated in this appendix and Volume I, Section 4.

Jurisdictional Addenda Meetings:

The participating cities and special district convened their steering committees during the County meeting processes described above. During these meetings, the Steering Committees for each jurisdiction provided comments on draft updates, revised and prioritized their actions, and reviewed the NHMP implementation and maintenance schedule. In addition, the City of McMinnville convened their steering committee September 17, September 23, and October 3 for details on the agenda of these meeting see below.

In addition to the meetings listed above, there were numerous informal meetings and email exchanges between Steering Committee members, OPDR, the County, and other state agencies.

The following pages includes copies of meeting agendas and sign-in sheets.

Yamhill County NHMP Update Kick-Off (July 17, 2019)



AGENDA

Meeting: Yamhill County NHMP Update - Kickoff
Date: July 17, 2019
Time: 1:30pm – 3:30pm
Location: Yamhill County Auditorium, 2060 NE Lafayette Ave, McMinnville

I. Welcome and Background	10 minutes
a. Introductions	
b. Project context	
II. Natural Hazard Mitigation Planning	15 minutes
a. Emergency Management Overview	
b. Natural Hazard Mitigation Plans (NHMP) Overview	
III. Existing NHMP Overview and Review	15 minutes
IV. Community Profile Update	15 minutes
a. Changes in development since previous plan	
b. Critical facilities	
V. Hazard History	15 minutes
a. Hazard history since previous plan	
What are the critical hazard concerns for your community?	
Any changes since the previous plan?	
VI. Mission and Goals review	15 minutes
a. Visioning Exercise	
VII. Mitigation Actions Review	20 minutes
a. Review previous action categories	
b. Feedback and broad new action ideas	
VIII. Public Outreach Strategy	10 minutes
IX. Wrap Up and Next Steps	5 minutes

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YAMHILL COUNTY EMERGENCY MANAGEMENT

Hazard Mitigation Plan Update Meeting July 17, 2019

NAME	Attendance	Response	
Brian Young	Meeting Organizer	None	BY
'Joe Hannan'	Required Attendee	None	
Jay Harris	Required Attendee	None	Jay Harris
Doug.rux@newbergoregon.gov	Required Attendee	None	
Rob Daykin (Dundee City Manager)	Required Attendee	None	
Dundee Fire Department	Required Attendee	None	
ddurham@ci.carlton.or.us	Required Attendee	None	
LORI GILMORE	Required Attendee	None	
Terry Lucich	Required Attendee	None	
Fred Hertel	Required Attendee	Tentative	
rroaden@ci.dayton.or.us	Required Attendee	Accepted	Raebelee Rooden
ssagmiller@ci.dayton.or.us	Required Attendee	None	
'Jeff Towery'	Required Attendee	Tentative	
Heather Richards	Required Attendee	None	
Rich Leipfert	Required Attendee	None	
Kenna West	Required Attendee	Accepted	Kenna West
Jeff Brown	Required Attendee	None	
Frank Sheridan	Required Attendee	Accepted	Frank Sheridan
Sugg, Steven	Required Attendee	Accepted	Steven Sugg
Carrie Zimbrick	Required Attendee	Accepted	
Marci E. Humlie	Required Attendee	None	
John Dietz	Required Attendee	Accepted	JCD
Paul Myatt	Required Attendee	None	
Gary Van Der Veen	Required Attendee	None	
Mike Kemper	Required Attendee	None	
Russ Heath	Required Attendee	None	
Steve Sims	Required Attendee	Accepted	Steve Sims
Mark.Havener@tvfr.com	Required Attendee	Accepted	M. Havener
Mike Bisset	Required Attendee	None	MB
David Renshaw	Required Attendee	None	
Mary Starrett	Optional Attendee	Accepted	MS
Ken Nygren	Optional Attendee	Accepted	KN
Michael Howard	Optional Attendee	Accepted	
Scott Rosenbalm	Optional Attendee	Accepted	SR
Roy Panschow	Optional Attendee	None	
Kevin Perkins	Optional Attendee	Accepted	
Kevin Martinez	Optional Attendee	Accepted	
Mike Bisset	Optional Attendee	Tentative	
'Preston Polasek'	Required Attendee	Declined	
Brandon Bowdle	Optional Attendee	Declined	
Damon Schultz	Optional Attendee	Declined	Damon Schultz
Kennedy, Allen J.	Optional Attendee	Declined	

Yamhill County NHMP Update Meeting #2 (August 21, 2019)



AGENDA

Meeting: Yamhill County NHMP Update – Meeting #2: Risk Assessment and Actions
Date: August 21, 2019
Time: 1:30pm – 3:30pm
Location: Yamhill County Auditorium, 2060 NE Lafayette Ave, McMinnville

- | | |
|--|-------------------|
| I. Welcome and Meeting Goals | 5 minutes |
| a. Committee Introductions | |
| b. Project Updates | |
| II. Critical Facilities Update and Review | 10 minutes |
| a. Overview of Critical Facilities inventory | |
| b. Additional facilities? | |
| III. Hazard Vulnerability Assessment | 30 minutes |
| a. Review and update | |
| IV. Action Item Update and Review | 60 minutes |
| a. Present changes | |
| b. Discuss new actions | |
| c. Prioritize actions | |
| V. Questions and Discussion | 10 minutes |
| VI. Wrap Up and Next Steps | 5 minutes |
| a. Next Steps | |

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YAMHILL COUNTY EMERGENCY MANAGEMENT

Hazard Mitigation Plan Update Meeting

August 21, 2019

Name	Agency	Email / Phone
Anderson, Jim		
Bisset, Mike	<i>WFS</i>	
Bowdle, Brandon		
Brown, Jeff		
Burke, James	<i>McMinnville Water & Light</i>	<i>jswb@mc-power.com 503 379-1346</i>
Daykin, Rob		
ddurham@ci.carlton.or.us		
Dietz, John	<i>McMinnville Water + Light</i>	<i>JCD@mc-power.com 503-472-6158</i>
Disbrow, Jay	<i>Jay Disbrow City of Yamhill Falls</i>	
Dundee Fire Department		
Gilmore, Lori		
Hall, Laury		
Hannan, Joe		
Harlan, Carol Ann		
Harris, Jay	<i>J. Harris</i>	<i>503 537 1211</i>
Havener, Mark		
Heath, Russ		
Hertel, Fred		
Howard, Michael	<i>✓</i> <i>Michael Howard</i>	<i>mrhoward@oregon.edu</i>
Howard, Richard		
Humlie, Marci		
Kemper, Mike	<i>MK</i> <i>Planning</i>	<i>434-7916</i>
Kennedy, Allen J.		



YAMHILL COUNTY EMERGENCY MANAGEMENT

Hazard Mitigation Plan Update Meeting

August 21, 2019

Martinez, Kevin	CARLTON PD	971/241/9152
Maytt, Paul	<i>PM</i>	
McDormott, Debbie		
Nygren, Ken	YCEM	<i>Ken Nygren</i>
Panschow, Roy		
Perkins, Kevin		
Polasek Preston		
Renshaw, David		
Richards, Heather		
Rosenbalm, Scott	McMinnville W&L	531@mc-power.com
<i>Roaden, Rochelle</i> rroaden@ci.dayton.or.us	<i>Rochelle Forde</i>	<i>City of Dayton</i>
Rux, Doug		
Schulz, Damon <i>D. Schulz</i>	<i>D. Sheridan / westvalla fire</i>	971-241-3884
Sheridan, Frank		
Sims, Steve		
ssagmiller@ci.dayton.or.us		
Starrett, Mary		
Sugg, Steven		
Thomas, Michael	CITY OF AMITY	mthomas@ci.amity.or.us
Towery, Jeff		
Van Der Veen, Gary		
Vogt, Matt		
West, Kenna		
Young, Brian	YCEM	<i>BY</i>
Zimbrick, Carrie		

Yamhill County NHMP Update Meeting #3 (September 23, 2019)



AGENDA

Meeting: Yamhill County NHMP Update – Meeting #3: Action Prioritization and Implementation
Date: September 23, 2019
Time: 1:30pm – 3:30pm
Location: Yamhill County Auditorium, 2060 NE Lafayette Ave, McMinnville

- | | |
|--|-------------------|
| I. Welcome and Meeting Goals | 5 minutes |
| a. Project Updates | |
| II. Action Item Review and Prioritization | 55 minutes |
| a. Present changes | |
| b. Discuss new actions | |
| c. Prioritize actions | |
| III. Implementation and Maintenance | 45 minutes |
| IV. Questions and Discussion | 10 minutes |
| V. Wrap Up and Next Steps | 5 minutes |
| a. Next Steps | |

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YAMHILL COUNTY EMERGENCY MANAGEMENT
Hazard Mitigation Plan Update Meeting
September 23, 2019

Name	Agency	Email / Phone
Anderson, Jim		
Bisset, Mike <i>JMB</i>		
Bowdle, Brandon		
Brown, Jeff		
Burke, James <i>JMB</i>	<i>MWL</i>	<i>swb@mc-power.com</i>
Daykin, Rob		
<i>ddurham@ci.carlton.or.us</i>		
Dietz, John	<i>MWL</i>	<i>JCD@mc-power.com</i> <i>503-472-6158</i>
Disbrow, Jay	<i>CITY OF YAMHILL</i>	<i>J. DISBROW</i> <i>503-708-1740</i>
Dundee Fire Department		
Gilmore, Lori		
Hall, Laury		
Hannan, Joe		
Harlan, Carol Ann	<i>YCEM</i>	<i>503-474-7437</i> <i>harlan@co.yamhill.or.us</i>
Harris, Jay	<i>City of Newberg</i>	<i>Karen tas michael</i> <i>@NewbergOregon</i> <i>503</i>
Havener, Mark		
Heath, Russ		
Hertel, Fred		
Howard, Michael		
Howard, Richard		
Humlie, Marci		
Kemper, Mike <i>+</i>		
Kennedy, Allen J.		
Leipfert, Rich		
Lucich, Terry		

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YAMHILL COUNTY EMERGENCY MANAGEMENT

Hazard Mitigation Plan Update Meeting

September 23, 2019

Name	Agency	Email / Phone
Martinez, Kevin	City of Carlton	ramerson@ci.carlton.or.us
Maytt, Paul	YCEM	
McDormott, Debbie		
Nygren, Ken	YCEM	nygrenk@co.yamhill.or.us
Panschow, Roy		
Perkins, Kevin		
Polasek Preston		
Renshaw, David		
Richards, Heather		
Rosenbalm, Scott	McMinnville Water Light	sg1@mc-power.com
rroaden@ci.dayton.or.us	City of Dayton	62328
Rux, Doug		
Schultz, Damon		
Sheridan, Frank	City Sheard	fsherid@cityofsheard.or.us
Sims, Steve		
ssagmiller@ci.dayton.or.us		
Starrett, Mary		
Sugg, Steven		
Thomas, Michael	Amity	mthomas@ci.amity.or.us
Towery, Jeff		
Van Der Veen, Gary	Yamhill County	derveen@g.co.yamhill.or.us
Vogt, Matt		
West, Kenna		
Young, Brian		
Zimbrick, Carrie		

Nelson, Malachi *M. N.*

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Yamhill County NHMP Update: McMinnville Addendum Meeting #I (September 17, 2019)



COMMUNITY SAFETY & RESILIENCY

Proactively plan for & responsibly maintain a safe & resilient community.

Natural Hazards Mitigation Plan (NHMP) Meeting

CDC Large Conference Room

Tuesday, September 17, 2019

2:00-4:00pm

AGENDA

1. Overview of work to date (5 min)
 - a. Introductions
 - b. Sign in sheet
 - c. Agenda review
 - d. Prior County meetings: July 17th & August 21st
 - e. YC NHMP – October 2014 (YC & 8 cities)
 - f. COM EOP hazard analysis
 - g. City Strategic Plan action item
2. Hazard Goals and Policy Crosswalk memo review (10 min)
3. Critical and Essential Facilities and Infrastructure memo review (15 min)
 - a. UofO list
 - b. COM transportation list
 - c. COM EOP vital service page
4. OEM Hazard Analysis Methodology memo review (20-30 min)
 - a. UofO work
 - b. COM EOP hazard analysis
5. Mitigation Hazard Action Item development (45-60 min)
 - a. UofO list from YC plan
 - b. Newberg list from 2014 YC NHMP
6. Next steps:
 - a. Survey: Posted on the "Latest News" section of City homepage website:
<https://www.mcminnvilleoregon.gov/cityadmin/page/countywide-survey-natural-hazard-mitigation>
 - b. City of McMinnville meeting w/ UofO: Monday, Sept. 23rd at 10am in Civic Hall
 - c. Countywide workgroup meeting: Monday Sept. 23rd at 1:30pm @ YC Public Works



Meeting Sign-In

Yamhill NHMP Update:

McMinnville Addendum Meeting

Tuesday, September 17, 2019 - 2:00pm



Name	Signature	Representing (Agency/Department)
MIKE BASS	<i>[Signature]</i>	community development
James Burke	<i>[Signature]</i>	MW&L
Scott Rosenbaum	<i>[Signature]</i>	MW&L
Jean Dietz	<i>[Signature]</i>	MW&L
Matt Salas	<i>[Signature]</i>	Mac Police Dept
Rich Leipfert	<i>[Signature]</i>	MAC Fire
LARRY SHERRARD	<i>[Signature]</i>	Engineering
Leland Koester	<i>[Signature]</i>	Wastewater Services
DAVID RAUSMAN	<i>[Signature]</i>	PUBLIC WORKS
SCOTT BURKE	<i>[Signature]</i>	Mac IT
David Koch	<i>[Signature]</i>	City Attorney



Meeting Sign-In

Yamhill NHMP Update:
McMinnville Addendum Meeting
Tuesday, September 17, 2019 – 2:00pm



Name	Signature	Representing (Agency/Department)
Jenny Berg		McMinnville Library
Hester Richards		Planning - City
Seth Taverny		City Manager

Yamhill County NHMP Update: McMinnville Addendum Meeting #2 (September 23, 2019)



Agenda

Meeting: Yamhill County NHMP Update: McMinnville Addendum
Date: September 23, 2019
Time: 10:00 AM – 12:00 PM
Location: McMinnville Civic Hall building, 200 NE Second Street, McMinnville, OR

- I. Welcome and Introductions**
 - a. Overview of NHMP process
- II. Hazard Identification**
 - a. Review Hazard Identification
 - b. Complete Jurisdiction Specific Hazard Inventories
- III. Review Existing Vulnerability Information**
 - a. Review Identified Vulnerabilities
 - b. Identify Jurisdiction Specific Assets and Vulnerabilities
- IV. Jurisdiction Specific Risk Assessment**
 - a. Review/ Revise Jurisdiction Specific Hazard Vulnerability Assessment (HVA)
- V. Jurisdiction Specific Mitigation Strategy**
 - a. Review Process and County Strategy
 - b. Review, Update, and Develop Jurisdiction Specific Actions
 - c. Prioritize Actions
- VI. Overview of Implementation and Maintenance**
- VII. Next Steps**
 - a. Prepare final draft of the NHMP for City Review
 - b. Provide the OMD-Office of Emergency Management a Review Opportunity
 - c. Submit updated plan to FEMA for review



Meeting Sign-In

Yamhill NHMP Update:
McMinville Addendum Meeting
Monday September 23, 2019

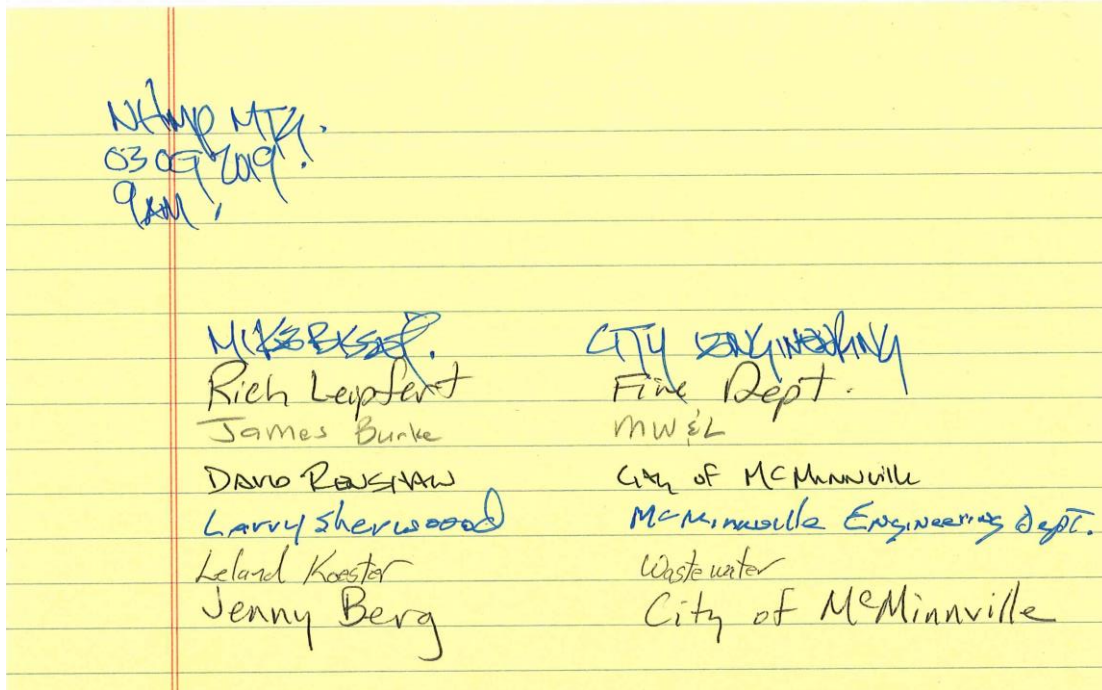


Name	Signature	Representing (Agency/Department)
Mike Bissett		COM. Del.
David Koch		City Attorney
Larry Sherwood		Engineering

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Yamhill County NHMP Update: McMinnville Addendum Meeting #3 (October 2, 2019)

Reviewed and prioritized actions, provided edits to hazard, vulnerability, and risk information.



NOTE: This section includes reproduction of the planning process sections from the 2014 Yamhill County MHMP Update, produced by OPDR, and the 2009 Yamhill County MHMP Update, produced by URS Corporation.

2014 Plan Update

Public Participation Process

This section provides an overview of the planning process; identifies the Steering Committee members and key stakeholders; documents public outreach efforts; and summarizes the review and incorporation of existing plans, studies, and reports used to develop this MHMP. Additional information regarding the Steering Committee and public outreach efforts is provided in Appendices D and E.

The requirements for the planning process, as stipulated in DMA 2000 and its implementing regulations.

The 2009 Yamhill County Multi-Jurisdictional Hazard Mitigation Plan described the natural and technological hazards, critical facilities, and resulting mitigation goals and actions for county-owned facilities as well as all of its incorporated jurisdictions except for the cities of Carlton and McMinnville. This document reviews and updates the 2009 Yamhill County MHMP with a focus on natural hazards. As updated, the plan includes the Cities of Amity, Dayton, Dundee, Lafayette, Newberg, Sheridan, Willamina, and Yamhill City in a single document. Information on technological hazards can be found in Appendix I. The Cities of Carlton and McMinnville are not participating in this hazard mitigation planning process. However, the document has been designed to easily add the jurisdiction should they choose to participate in the future.

Overview of Planning Process

This 2014 Yamhill County Multi-Jurisdictional Hazard Mitigation Plan update is intended to: include identified hazards affecting individual jurisdictions; supplement the risk assessment and vulnerability analysis performed in the 2009 plan update; provide community based mitigation actions; identify funding sources; and include the incorporated jurisdictions within the county as part of the update.

The first step in the planning process was to establish Steering Committees within each participating jurisdiction. These Steering Committees consisted of county and city representatives, and representatives from the rural fire districts within the County. Sue Lamb, Yamhill County Emergency Manager served as the primary point of contact for the overall plan update and development. Table 3-1 identifies the Steering Committee leaders and participants from each jurisdiction.

Once the Steering Committees were formed, the following six-step planning process took place from February to July 2014.

- **Organize Resources:** The Steering Committees identified resources, including county staff, city departments and agencies, and local non-governmental organizations (NGOs), which could provide the technical expertise and historical information needed to update the MHMP.

- **Profile Hazards:** Each Steering Committee identified the hazards specific to Yamhill County and the cities of Amity, Dayton, Dundee, Lafayette, Newberg, Sheridan, Willamina, and Yamhill City. A hazard analysis was developed for the nine hazards identified.
- **Assess Risks:** A vulnerability analysis was developed for the county and each of the incorporated communities. The county and incorporated communities used the vulnerability analyses results in the mitigation strategy development.
- **Assess Capabilities:** Each Steering Committee reviewed the current administrative and technical, legal and regulatory, and fiscal capabilities to determine whether existing provisions and requirements adequately address relevant hazards in each respective jurisdiction.
- **Develop Mitigation Strategy:** Each Steering Committee developed a comprehensive range of potential mitigation goals and actions. Subsequently, Yamhill County and the incorporated communities identified, evaluated, and prioritized the actions to be implemented in the county- and city-specific Mitigation Action Plans (Section 7).
- **Monitor Progress:** Each Steering Committee developed an implementation process to ensure the success of an ongoing program to minimize hazard impacts to Yamhill County and the incorporated communities.

Hazard Mitigation Steering Committee

Formation of the Steering Committee

This planning update process began in February 2014. Each Steering Committee leader formed the advisory body, known as the Steering Committee, using staff from relevant local departments, and agencies. The Steering Committee members representing community members within Yamhill County and each of the county’s eight participating incorporated cities, are listed in Table B-2 and the meetings held throughout the planning process are described below.

Table B-2. Steering Committees

Name	Agency/Department
Yamhill County	
Sue Lamb	County Emergency Manager
Ken Friday	Planning Division Manager
Ken Nygren	County Assistant Emergency Manager
Bill Gille	County Engineer
Gary Van Der Veen	County Environmental Health Specialist
Sarah Bates	Public Health Preparedness Coordinator
Chris Shultz	Community Preparedness Specialist
City of Amity	
Larry Layton	City Administrator
Matt Johnson	Public Works Superintendent
Michael Cape	Mayor
Charles Eaton	City Engineer
City of Dayton	
Scott Pingel	City Manager
Christy Ellis	Previous City Manager

Name	Agency/Department
Ross Schultz	Previous City Manager
Elizabeth Wytoski	Mayor
Steve Sagmiller	Public Works Director
City of Dundee	
Rob Daykin	City Administrator
Al Mustain	Superintendent of Public Works
John Stock	Fire Chief
City of Lafayette	
Preston Polasek	City Administrator
Chris Heisler	Mayor
Terry Lucich	Fire Chief
Jim Anderson	Public Works Foreman
Lori Martino	Community Development Clerk
City of Newberg	
Brittney Jeffries	Public Affairs Officer
Mary Newell	Police Support Services Manager
Jay Harris	Public Works Director, Pro-Tem
Steve Olson	Building and Planning Director, Pro-Tem
City of Sheridan	
Frank Sheridan	City Manager
Yvonne Hamilton	Deputy City Recorder
Kie Cottam	Director of Public Works
City of Willamina	
Chris Ann Harris	Office Coordinator
Jeff Brown	Public Works Superintendent
Charlene Brown	Museum Curator
Dave Morey	Fire Department
Matt Reneiss	Fire Department
City of Yamhill	
Richard Howard Sr.	Public Works Superintendent
Lori Gilmore	City Recorder/Treasurer
Paula Terp	Mayor
Jo Weinstein	City Councilor
Kay Echaui	City Councilor
Jay Disbrow	City Councilor

Planning Team Meetings

Yamhill County's contractor, Oregon Partnership for Disaster Resilience, provided technical guidance throughout the planning process.

February 26, 2014

During the kickoff meeting, Oregon Partnership for Disaster Resilience (OPDR) staff discussed the project's objective of updating Yamhill County's existing mitigation plan to include the incorporated cities within the county with the end result of a multi-jurisdictional

all-hazards mitigation plan. The DMA 2000 requirements, the hazard mitigation planning process, public outreach opportunities, mitigation projects and grant funding opportunities, Steering Committee formation, were also discussed. Additionally OPDR gathered data from participants to update hazard histories and facilitated a discussion about the mitigation strategies proposed in the 2009 MHMP Update.

Each jurisdiction filled out data collection forms to assist in updating hazard identification and hazard histories. The hazard identification data collection form was based on the State of Oregon Natural Hazards Mitigation Plan and the existing Yamhill County Hazard Mitigation Plan and is meant to familiarize city representatives with the approach and concepts used in the risk identification phase of MHMP development. Nine natural hazards were determined to pose the greatest potential risk in Yamhill County and participating jurisdictions. Those include erosion (riverine), drought, earthquake, landslide/debris flow, volcanic eruption, wind storm, winter storm, and wildland/urban interface fire.

April 9, 2014

In the second Steering Committee meeting, OPDR facilitated a discussion regarding proposed changes to the 2009 hazard list. The Steering Committee reached a consensus to accept the natural hazards listed above, deleting El Nino/Southern Oscillation and expansive soils from the natural hazards of concern. The committee also agreed that because technological hazards were not to be updated they would be moved from the MHMP document's base list to an appendix. The discussion of the hazards was followed by a presentation regarding public involvement strategies for the current MHMP update process and for plan maintenance between 2014 and 2019.

The majority of the meeting time was spent in exercises used to update the county and jurisdictions' vulnerabilities analysis. Participants reviewed key takeaways from the 2009 Threat Assessment and then identified assets and vulnerabilities by focusing on various systems: human population, economic assets, cultural and historic resources, infrastructure and critical facilities, and environmental assets. Each jurisdiction filled out worksheets to help identify assets and vulnerabilities. Responses on the worksheets helped to guide a discussion about shared and unique vulnerabilities. A brief discussion comparing State of Oregon hazard mitigation planning goals and the 2009 Yamhill County Mitigation goals closed out the meeting, priming participants for a more robust discussion of mitigation goals, strategies, and action items to come in the final Steering Committee meeting.

May 21, 2014

In the final Steering Committee meeting, OPDR facilitated a discussion to update the mitigation goals from the 2009 MHMP. OPDR proposed changes and additions to the existing goal language based on a review of goals contained in the Oregon NHMP. The Steering Committee discussed the proposed updates, made suggestions for language and other additional goals, and came to consensus regarding the final mitigation goals for the 2014 MHMP.

The second section of the meeting was devoted to prioritizing mitigation action items. Meeting participants reviewed mitigation action items from the 2009 MHMP as well as vulnerabilities identified in the April 9, 2014 meeting as a starting point to select and add to their list of action items for the 2014 MHMP update. Participants prioritized 3-5 action items per jurisdiction based on their importance, feasibility and relationship to key

community vulnerabilities. After identifying the prioritized actions, participants filled out detailed action item worksheets to be added to the MHMP document.

The last major component of the meeting was a discussion of implementation and maintenance plans. OPDR presented an overview of potential structures for the implementation and maintenance plans. The Yamhill County Emergency Manger facilitated a group discussion to refine the implementation and maintenance strategy.

Public Involvement

On May 27, 2014, shortly after the final Steering Committee meeting, Yamhill County distributed a survey throughout the County and to participating jurisdictions regarding the preparation of the MHMP. Links to the survey and the 2009 MHMP were posted on Yamhill County Emergency Management’s website and Facebook page. All residents of Yamhill County were invited to participate. Participating jurisdictions also posted the survey link to their websites and Facebook pages. The county held the survey open until June 30, 2014. Results of the survey are available for viewing at the following link: <https://www.surveymonkey.com/results/SM-DTTKWKJ8/>.

During community events the County and participating jurisdictions offered survey questions as “dot charts” to allow the public to respond to the survey in person. At these community events copies of the 2009 MHMP and the draft 2014 MHMP were available for the public to review.

Participating cities also held public hearings and open city council work sessions to inform the public about the MHMP update process and to gather public comments. Cities used school newsletters, community calendars, bulletin boards, press releases in local newspapers, radio stations, Facebook pages, and city websites to inform the public about opportunities to comment on the MHMP update. Copies of the draft 2014 MHMP were distributed with comment sheets in public places such as city halls and public libraries as well.

Copies of public involvement announcements are included in Appendix E and the public involvement mechanisms used are included in each jurisdiction specific addendum.

The county Emergency Manager received one comment via email from an engaged citizen following review of the plan. In summary, the citizen recommended that the county purchase and stage temporary bridges to ensure access to hospitals and other critical facilities in the event of a disaster. The County is considering this comment through its emergency response planning process.¹

¹ Dear Ms. Lamb, “My 2-cents-worth of input relates to access to local hospitals in the event of bridge failure(s). It strikes me that until critical bridges can be upgraded to survive a now widely expected magnitude 9+ earthquake, it might be a good idea to explore the feasibility of pontoon or Bailey-type temporary bridges. Necessary pieces could be stored in a “safe” location and transported to a predetermined location after a disaster. This location would either have existing usable graded access to the temp bridge anchor points or be amenable to quickly constructing such access....Thanks for the opportunity to comment. No response from you is necessary.” Robert Wolcott

Incorporation of Existing Plans and Other Relevant Information

During the planning process, the Steering Committees reviewed and incorporated information from existing plans, studies, reports, and technical reports into the MHMP. A detailed list of references used throughout the document is included in Section 9. A synopsis of the sources follows.

- *Yamhill County Natural Hazards Mitigation Plan*: The Yamhill County Natural Hazards Mitigation Plan includes resources and information to assist county residents, public and private sector organizations and others interested in participating in natural hazard mitigation activities.
- *Yamhill County Comprehensive Plan*: The land use element provided information on existing land use and future development trends. The safety element provided information for the hazard profiles and development of the mitigation strategy for landslides, fire, and flood hazards. The seismic safety element provided information for the hazard profile section and the mitigation strategy for earthquakes and tsunamis.
- *Yamhill County Zoning Ordinance*: These codes regulate development and land use; they were used to develop the capability assessment and the mitigation strategy.
- *Lower Yamhill Watershed Assessment*: The overriding purpose of the assessment is to evaluate the natural and human processes influencing the watershed's ability to produce clean water and suitable habitat for aquatic life
- *Oregon's Statewide Natural Hazard Mitigation Plan*: This plan, prepared by the State Interagency Hazard Mitigation Team, was consulted to establish consistency with the State hazard mitigation plan.
- *Yamhill County Economic Development Plan*: This document sets out a five-year strategic plan for Yamhill County's economic development efforts.
- *Yamhill County Public Health Comprehensive Plan*: This plan describes the status of health needs and unmet needs in Yamhill County with discussion surrounding on local public health services, basic services, and additional services. Hazards are discussed in the section on additional services in the context of public health preparedness.
- *Ten Year Ending Homelessness Plan*: This document, developed in 2009, presents strategies to prevent eventually eliminate chronic homelessness in Yamhill County and its jurisdictions. Strategies include provision of permanent housing and coordinated services.
- *Yamhill Watershed Culvert Prioritization and Action Plan for Fish Passage*: This plan, developed in 2012 by the Bureau of Land Management, surveys 178 culverts to prioritize culvert upgrades for fish passage. In places where the fish passage needs coincide with needs for flood control actions can be clustered between partners to leverage more funding opportunities for projects.

Section 7 includes the incorporated city-specific existing plans, studies, and reports used during the update.

2003-06 and 2009 Plan Update

Planning Process

This section provides an overview of the planning process; identifies the Steering Committee members and key stakeholders; documents public outreach efforts; and summarizes the review and incorporation of existing plans, studies, and reports used to develop this MHMP. Additional information regarding the Steering Committee and public outreach efforts is provided in Appendices N and O.

The requirements for the planning process, as stipulated in DMA 2000 and its implementing regulations.

The 2006 Yamhill County Natural Hazards Mitigation Plan described the hazards, critical facilities, and resulting mitigation goals and actions for county-owned facilities. This document reviews and updates the Yamhill County's original plan and addresses the new participating jurisdictions of the Cities of Amity, Carlton, Dayton, Dundee, Lafayette, Newberg, Sheridan, Willamina, and Yamhill City in a single document.

The City of McMinnville is not participating in this hazard mitigation planning process. However, the document has been designed to easily add the jurisdiction should they choose to participate in the future.

Overview of Planning Process

Initial Planning Process, 2003-2006

Yamhill County Emergency Management, Mid-Willamette Valley Council of Governments, and Oregon Natural Hazards Workgroup combined resources to form the Hazard Mitigation Plan Steering Committee and collaboratively develop the 2006 Natural Hazards Mitigation Plan. (ONHW 2006)

The following Steering Committee and Project Team members assisted in development of the 2006 HMP. The 2006 Steering Committee consisted of Project Managers Mark Fancey and Judith Ingram Moore of the Mid-Willamette Valley Council of Governments. Committee members from Yamhill County included John Caputo, Planning Director; Ken Friday, GIS Analyst; Kathy George, Planning Division Manager; Bill Gille, Commissioner; Chris Johnson, Public Works Director; John Krawczyk, Public Health & Human Services; Leslie Lewis, Administrator; Jay Lilly, Commissioner; and Bob Maca, Emergency Management Coordinator. Other Committee participants included Dean Bender, community member; McMinnville Fire Department Chief; and Mike Brandt, Polk County Emergency Manager. The Project Team consisted of the Oregon Natural Hazards Workgroup and participants included Andre LeDuc, Director; David Reesor, Team Manager, and team members Robert Richardson, Alison Thayer, and Tina Nunez.

The committee received input from the following Yamhill County agencies and citizens: county departments, countywide fire districts, businesses, school districts, education service districts, colleges, Yamhill Basin Council Coordinator, soil and water conservation districts, the Oregon Department of Forestry, U.S. Bureau of Land Management, public utilities and the incorporated jurisdictions' representatives. GIS maps were provided by the Mid-Willamette Valley Council of Governments and Yamhill County GIS staff.

In adherence with DMA 2000 requirements, the Steering Committee met eight times from September 2004 through April 2005 to establish an outline, schedule, and develop plan goals and objectives; and to write the hazard mitigation plan. The Project Team gathered and shared information, assessed vulnerabilities, identified critical facilities, developed mitigation strategies, and provided continuity throughout the planning process.

During the nine-month planning period, the Project Team compiled information and collected data for seven natural hazards, including flood, landslide, wildfire, severe winter storm, windstorm, drought, and earthquake. Information was obtained from local historical records, and a variety of local, state, and federal agencies. In addition, public input was sought throughout the planning process. The Steering Committee interviewed stakeholders, listened to community member input, and held a public open house on April 20, 2005.

The 2006 Hazard Mitigation Plan forms the basis for the county's new MHMP's focus. The plan identified six planning goals, developed action items to refine goal achievement, provided a matrix for use in delineating the roles of coordinating and partner organizations, provided timelines for achieving goals, notes implementation ideas, and lists specific planning goals addressed by each action item.

The Steering Committee and Project Team provided a solid foundation for future Yamhill County hazard mitigation planning update efforts. It is the intent of this 2009 MHMP to include newly identified hazards affecting individual jurisdictions, provide a comprehensive risk assessment and vulnerability analysis, focus on community based mitigation actions, and identify defined funding sources.

2009 Plan Update

This 2009 Yamhill County Multi-Jurisdictional Hazard Mitigation Plan update is intended to: include newly identified hazards affecting individual jurisdictions; provide a comprehensive risk assessment and vulnerability analysis; provide community based mitigation actions; identify funding sources; and include the incorporated jurisdictions within the county as part of the update.

FEMA provided technical assistance to facilitate developing this MHMP. This includes updating the portions of the existing plan for the unincorporated areas within the County as well as including the incorporated jurisdictions (Cities of Amity, Carlton, Dayton, Dundee, Lafayette, Newberg, Sheridan, Willamina, and Yamhill City).

The first step in the planning process was to establish Steering Committees within each participating jurisdiction. These Steering Committees consisted of county and city representatives, and representatives from the rural fire districts within the County. John Boynton Yamhill County Emergency Manager, and Laura Tschabold, County Administrator served as the primary points of contact for the overall plan update and development. The current point of contact for the planning effort is Doug McGillivray, the new County Emergency Manager. Table 4-1 identifies the Steering Committee leaders and participants from each jurisdiction.

Once the Steering Committees were formed, the following six-step planning process took place from April 2008 to February 2009.

- **Organize Resources:** The Steering Committees identified resources, including county staff, city departments and agencies, and local non-governmental organizations (NGOs), which could provide the technical expertise and historical information needed to update the MHMP.
- **Profile Hazards:** Each Steering Committee identified the hazards specific to Yamhill County and the cities of Amity, Carlton, Dayton, Dundee, Lafayette, Newberg, Sheridan, Willamina, and Yamhill City. A hazard analysis was developed for these 16 hazards.
- **Assess Risks:** A vulnerability analysis was developed for the county and each of the incorporated communities. The county and incorporated communities used the vulnerability analyses results the mitigation strategy development.
- **Assess Capabilities:** Each Steering Committee reviewed the current administrative and technical, legal and regulatory, and fiscal capabilities to determine whether existing provisions and requirements adequately address relevant hazards in each respective jurisdiction.
- **Develop Mitigation Strategy:** Each Steering Committee developed a comprehensive range of potential mitigation goals and actions. Subsequently, Yamhill County and the incorporated communities identified, evaluated, and prioritized the actions to be implemented in the county- and city-specific Mitigation Action Plans (Appendices A-J).
- **Monitor Progress:** Each Steering Committee developed an implementation process to ensure the success of an ongoing program to minimize hazard impacts to Yamhill County and the incorporated communities.

Hazard Mitigation Steering Committee

Formation of the Steering Committee

This planning update process began in April 2008. Each Steering Committee leader formed the advisory body, known as the Steering Committee, using staff from relevant local departments, agencies, and NGOs. The Steering Committee members represent community members within Yamhill County and each of the county’s nine participating incorporated cities, are listed in Table B-3 and the meetings held throughout the planning process are described below.

Table B-3. Steering Committees

Name	Agency/Department
Yamhill County	
Doug McGillivray	County Emergency Manager (Current)
Laura Tschabold	County Administrator
John Boynton	County Emergency Manager (former)
Karen McFaddin	County Emergency Management
Janean Douglas	County Emergency Management
Jennifer Busey	County Emergency Management
City of Amity	
Michael Cape	Mayor
Jennifer Elkins	City Recorder
Matt Johnson	Public Works

Name	Agency/Department
Charles Eaton	Contract Engineer
City of Carlton	
Steven Weaver	City Manager
Brian Burnham	Public Works Director
Frank Butler	Police Chief
Roy Durfee	Carlton Elementary School, School District Facilities Director
Suzanne Dufner	City Planner (Contract)
Peter Blumenthal	City Engineer (Contract)
Terry Lucich	District Fire Chief
City of Dayton	
Sue Hollis	City Manager
City of Dundee	
Rob Daykin	City Administrator
Alan Mustain	Superintendent of Public Works
John Stock	Fire Chief
Brian Casey	Police Chief (Contract)
Luke Eelz	Planner (Contract)
City of Lafayette	
Diane Rinks	City Administrator
Don Leard	Mayor
Terry Lucich	Fire Chief
Jim Anderson	Public Works Foreman
City of Newberg	
Roger Gano	Emergency Manager
Jean Nilles	Retired Business Owner
Elvern Hall	Retired Business Manager
Stan Gaibler	Retired Farmer
Ken Austin III	
Spike Sumner	
Sherry Walker	
City of Sheridan	
Frank Sheridan	City Manager
Yvonne Hamilton	Deputy City Recorder
City of Willamina	
Chris Ann Harris	Office Coordinator
Jeff Brown	Public Works Superintendent
Charlene Brown	Museum Curator
Dave Morey	Fire Department
Matt Reneiss	Fire Department
Yamhill City	
Richard Howard Senior	Public Works Superintendent

Planning Team Meetings and Tasks

FEMA's contractor, URS Corporation, provided technical guidance throughout the planning process.

April 14, 2008

During the kickoff meeting, Kristen Meyers of FEMA Region X and Dennis Sigrist of the State of Oregon, Office of Emergency Management discussed the project objective to update Yamhill County's existing mitigation plan to include the incorporated cities within the county with the end result of a multi-jurisdictional all-hazards mitigation plan. The DMA 2000 requirements, the hazard mitigation planning process, public outreach opportunities, and mitigation projects and grant funding opportunities were also discussed. In addition, the use of GIS technology as a tool for identifying and mapping known hazards throughout the county was reviewed. Also discussed was the need for each jurisdiction to identify a Steering Committee to network with the citizens of Yamhill County within their community, other agencies, and other professionals who might have specialized knowledge about the hazards potentially affecting the county.

Each jurisdiction filled out data collection forms to assist in identifying necessary information to be included in the plan with a proposed schedule for each of the six sections. The sections included:

- Community Description Data
- Hazard Identification & History Data
- Repetitive Loss Data
- Vulnerability Data (Critical Facilities)
- Planning Data (Steering Committee, Methods of Public Engagement)
- Capability Assessment Data

The hazard identification data collection form was based on the State of Oregon Natural Hazards Mitigation Plan and the existing Yamhill County Hazard Mitigation Plan and is meant to familiarize city representatives with the approach and concepts used in the risk identification phase of MHMP development. Sixteen hazards were determined to pose the greatest potential risk in Yamhill County and participating jurisdictions. Those include flood, winter storm, landslide, wildland/urban fire, earthquake, volcano, wind, erosion, El Niño and La Niña, expansive soils, drought, dam failure, disruption of utility and transportation systems, hazardous materials, terrorism, and epidemic.

Over the next three months URS facilitated teleconferences (considered meeting #2) with each participating jurisdiction's Steering Committee to complete the data collection effort.

August 15 and 18, 2008

During the third and fourth public meetings, the Steering Committees and the general public review the draft hazard figures and the data used to develop each figure. They reviewed the draft asset information (critical facilities and infrastructure, population, and residential and nonresidential structures) for Yamhill County and the participating jurisdictions. Preliminary county- and city-specific vulnerability analyses information was presented. Next, the

Steering Committee examined and revised the initial list of mitigation goals and potential action items.

After the Steering Committee members reviewed the simplified Social, Technical, Administrative, Political, Legal, Economic, and Environmental (STAPLE/E) evaluation criteria, the members identified and prioritized the mitigation action items to be included in the MHMP.

September 2, 2008

The Steering Committee for Dayton determined it would be appropriate to add erosion to the list of hazards potentially affecting their community.

September 3, 2008

The Steering Committee for Sheridan determined it would be appropriate to add erosion, and pandemic/epidemic to the list of hazards potentially affecting their community.

September 4, 2008

The Steering Committee for Carlton determined it would be appropriate to add erosion, windstorm, expansive soils, terrorism, and pandemic/epidemic to the list of hazards potentially affecting their community.

September 8, 2008

The Steering Committee for Newberg determined it would be appropriate to add volcano, El Nino/La Nina, and utility and transportation system disruption to the list of hazards potentially affecting their community.

September 9, 2008

The Steering Committee for Lafayette determined the following changes to their hazard profile list would be appropriate. They decided to delete drought from the hazard profile list, and to add volcano and hazardous materials.

September 16, 2008

The Steering Committee for Dundee determined that it would be appropriate to add erosion to the list of hazards potentially affecting their community

September 17, 2008

The Steering Committee for Willamina determined landslide potential for their city is very low and has decided to remove it from the list of potential hazards that could affect their city (this decision was later revised due to community interest). The committee determined it would be appropriate to add erosion and utility and transportation system disruption to the list of hazards potentially affecting their community.

Public Involvement

Project Introduction

In early May 2008, shortly after the first Steering Committee meetings, a newsletter was distributed throughout the county regarding the preparation of the MHMP. The newsletter was sent out through utility bills and posted on websites inviting the public, local, State, and

Federal districts and agencies to participate in the planning process. Other media outlets used included newspapers and local radio stations.

Prior to the August 15 and 18, 2008 meeting, another public meeting announcement newsletter was published throughout the county inviting the public to participate in the risk assessment presentation.

Copies of the newsletters and public meeting announcements are included in Appendix O and the public involvement mechanisms used are included in each jurisdiction specific appendix (Appendices A-J).

Incorporation of Existing Plans and Other Relevant Information

During the planning process, the Steering Committees reviewed and incorporated information from existing plans, studies, reports, and technical reports into the MHMP. A detailed list of references used throughout the document is included in Section 9. A synopsis of the sources follows.

- *Yamhill County Natural Hazards Mitigation Plan*: The Yamhill County Natural Hazards Mitigation Plan includes resources and information to assist county residents, public and private sector organizations and others interested in participating in natural hazard mitigation activities.
- *Yamhill County Comprehensive Plan*: The land use element provided information on existing land use and future development trends. The safety element provided information for the hazard profiles and development of the mitigation strategy for landslides, fire, and flood hazards. The seismic safety element provided information for the hazard profile section and the mitigation strategy for earthquakes and tsunamis.
- *Yamhill County Comprehensive Land Use Plan*. This plan provides guidance on urban growth, change, and economic development; land and water conservation; transportation, communication, and public utilities; public land, facilities, and services; environmental quality; and energy conservation. It also suggests ways to implement, evaluate, and review land use.
- *Yamhill County Zoning Ordinance*: These codes regulate development and land use; they were used to develop the capability assessment and the mitigation strategy.
- *Lower Yamhill Watershed Assessment*: The overriding purpose of the assessment is to evaluate the natural and human processes influencing the watershed's ability to produce clean water and suitable habitat for aquatic life
- *Oregon's Enhanced State Natural Hazard Mitigation Plan*: This plan, prepared by the State Interagency Hazard Mitigation Team, was consulted to establish consistency with the State hazard mitigation plan.

Appendices B through J included the incorporated city-specific existing plans, studies, and reports used during the update.

APPENDIX C: COMMUNITY PROFILE

The following section describes the county from several perspectives in order to help define and understand the county’s sensitivity and resilience to natural hazards. Sensitivity and resilience indicators are identified through the examination of community capitals which include natural environment, social/demographic capacity, economic, physical infrastructure, community connectivity, and political capital. These community capitals can be defined as resources or assets that represent all aspects of community life. When paired together, community capitals can influence the decision-making process to ensure that the needs of the community are being met.¹

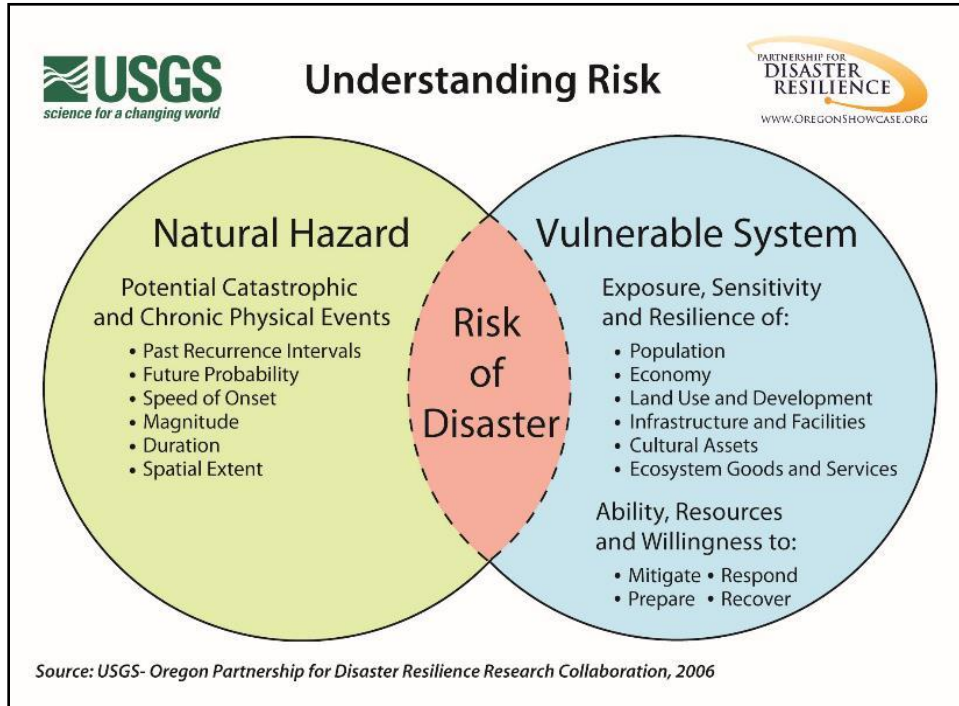
Sensitivity factors can be defined as those community assets and characteristics that may be impacted by natural hazards, (e.g., special populations, economic factors, and historic and cultural resources). Community resilience factors can be defined as the community’s ability to manage risk and adapt to hazard event impacts (e.g., governmental structure, agency missions and directives, and plans, policies, and programs).

Natural Environment Capacity	C-2
Social/Demographic Capacity	C-6
Economic Capacity	C-19
Physical Infrastructure Capacity	C-28
Community Connectivity Capacity	C-36
Political Capacity	C-40

The Community Profile describes the sensitivity and resilience to natural hazards of Yamhill County, and its incorporated cities, as they relate to each capacity. It provides a snapshot in time when the plan was developed and will assist in preparation for a more resilient county. The information in this section, along with the hazard assessments located in Volume I, Section 2 should be used as the local level rationale for the risk reduction actions identified in Volume I, Section 3. The identified actions seek to reduce the county’s sensitivity and increase its resiliency assist in reducing overall risk of disaster, the area of overlap shown in Figure C-1.

¹ Mary Emery and others, “Using Community Capitals to Develop Assets for Positive Community Change,” *CD Practice 13* (2006): 2

Figure C-I Understanding Risk



Oregon Partnership for Disaster Resilience

Source:

The U.S. Census delineates areas of settled population concentrations that are identifiable by name but are not legally incorporated as Census Designated Places (CDPs). There are two CDPs in Yamhill County but both are primarily located in Polk County and therefore are not included in the community profile.

Table C-I Yamhill County, Cities, and Census Designated Places

Incorporated Cities	
Amity	McMinnville
Carlton	Newberg
Dayton	Sheridan
Dundee	Willamina
Lafayette	Yamhill

Source: Portland State University Population Research Center, U.S. Census Bureau Tiger Lines Files

The remainder of this appendix will provide detailed information for Yamhill County and its incorporated cities.

Natural Environment Capacity

Natural environment capacity is recognized as the geography, climate, and land cover of the area such as, urban, water and forested lands that maintain clean water, air and a stable

climate.² Natural resources such as wetlands and forested hill slopes play significant roles in protecting communities and the environment from weather-related hazards, such as flooding and landslides. However, natural systems are often impacted or depleted by human activities adversely affecting community resilience.

Geography

Yamhill County has an area of about 716 square miles³ and is predominately located in the Lower Willamette River Basin in Northwestern Oregon (a small area of western Yamhill County is in the North Coast Basin). The Willamette River is fed by many small streams and tributaries running east across the county.

Elevations in the county range from a high of 3,425 feet at the peak of Trask Mountain (part of the Coastal Range in the northwest corner of the county) to a low of 90 feet just outside Butteville where the Willamette exits the northeast corner of the county. Yamhill county has three ecoregion designations: the Willamette River and Tributaries Gallery Forest, the Prairie Terraces, and the Valley Foothills.⁴ The eastern edge of the county is bordered by the Willamette River and consists of floodplains and river channels. Agriculture and residential development here have replaced the riparian gallery forests on these fertile soils. The Willamette runs north and is fed by other meandering rivers and streams running east across the county. These rivers crawl across the flat, poorly drained prairies. These Prairies Terraces are habitats for migrating birds, great for seed and small grain agriculture and “also experience the bulk of urban expansion”.⁵ The western half of Yamhill County is a forested transitional zone to the Coastal range. These valley foothills are drier than the eastern side of the valley or other more mountainous regions. This ecoregion is responsible for the timber and vineyards common in Yamhill County, and serves as a wildlife corridor between the valley and the surrounding mountains.

Willamette River

The Willamette River Basin covers 11,500 square miles, encompassing 16,000 miles of streams and is ranked 12th among US rivers in volume.⁶ The river is about 187 miles long and flows from the south to the north, originating in the mountains of west central Oregon, passing through many of the most populated cities including Eugene, Corvallis, Salem, and Portland and then emptying out into the Columbia River.⁷ The Willamette River is a vital, multi-purpose waterway that touches the lives of millions of people along its banks throughout the Pacific Northwest. The Willamette River has generated economic growth and promoted quality of life for the past 150 years. It is a source of power, irrigation,

² Mayunga, J. 2007. Understanding and Applying the Concept of Community Disaster Resilience: A capital-based approach. Summer Academy for Social Vulnerability and Resilience Building.

³ QuickFacts, U.S. Census Bureau, 2010-2018 Yamhill County. Web.
<https://www.census.gov/quickfacts/yamhillcountyoregon>

⁴ Thorson, Thor D. Bryce, Sandra A. Lammers, Duane A. Woods, Alan J. Omernik, James M. Kagan, Jimmy. Pater, David E. Comstock, Jeffrey A. 2003. Ecoregions of Oregon. Web. 1:1,500,000. USEPA Ecoregions of the Conterminous United States, Oregon State, Corvallis.
<http://people.oregonstate.edu/~muirp/FuelsReductionSWOregon/ToolsResources/EcoregionsOregonLevelIIVEPA.pdf>

⁵ Ibid.

⁶ Portland Bureau of Environmental Services. “Willamette Watershed.” Accessed April 3, 2020.
<https://www.willametteriver.org/wrwc/page/willamette-river>

⁷ Ibid.

forestry, agriculture, and recreation. However, to achieve these benefits, the structure and integrity of the river have been compromised with increased population growth and development.

Climate

Situated in the northern portion of the Willamette Valley, Yamhill County experiences a relatively mild climate with cool, wet winters and warm, dry summers. Temperatures in the valley may exceed 90°F in the summer or drop below 30°F in the winter but are generally more moderate than temperatures at higher elevations. Daily average temperatures in the summer range from the low 80s (low 90s at highest) down to the mid-50s, while average temperatures in the winter range from the mid-40s to the mid-30s (high 20s at lowest).⁸

The most important determinant of precipitation is elevation. Because Yamhill County spans from the valley floor of 55 feet to the heights of the coastal range at 3,425 there is considerable variation of precipitation totals from the mountains in the west to the river in the east. The western mountainous side of the county receives about twice as much precipitation as eastern valley side.

Total precipitation in the Pacific Northwest region may remain similar to historic levels but climate projections indicate the likelihood of increased winter precipitation and decreased summer precipitation.

Hazard Severity

Situated in the Willamette Valley with the Cascades off to the east, the county is susceptible to a variety of storms that can affect residents and damage property. Typical hazards to affect the county include drought, earthquake, flood, landslide and debris flow, wildfire, windstorm and winter storm. The leading threats are earthquakes, floods and winter storms. Refer to volume one, section two of NHMP for more information on hazard severity and other risk assessment information.

Ownership and Land Cover

Most land in Yamhill County is privately owned (83%). About 13% is federally owned by either the BLM (7%), the US Forest Service (5%), or the US Fish and Wildlife Service (< 1%). The State of Oregon owns less than one-percent (< 1%) and the Bureau of Indian Affairs owns the remaining two-percent (2%).⁹

The western portion of the county is mostly forested (and zoned for forest use) and is where most of the federally owned land is located. The eastern portion of the county is more urbanized with a higher percentage of privately owned land. The eastern portion of the county includes zoning for agriculture and a mix of urban and rural uses.

According to the *Willamette Valley Land Use/Land Cover Map Informational Report*, the valley portion of the county is largely made up of row crops along the Willamette River

⁸ Weather Spark. Average Weather in Yamhill County. <https://weatherspark.com/y/437/Average-Weather-in-Yamhill-Oregon-United-States-Year-Round>.

⁹ Oregon Bureau of Land Management USDI. Ownership Land Management Polygon. Analysis by IPRE. <https://www.blm.gov/services/geospatial/GISData/oregon>. Retrieved April 3, 2020.

while the upland areas are dominated by perennial grasses (39% of county land cover).¹⁰ There are few hedgerows, but a definite tendency toward hedgerows and smaller parcel size in the north end of the valley. Thanks to the abundant creeks and swales this land is naturally better drained than the rest of the Willamette Valley. Many areas in the northern portion of the valley do not have dominant uses but rather have a checkered design involving both the agricultural and natural vegetation cover classes.¹¹

Minerals and Soils

The characteristics of the minerals and soils present in Yamhill County indicate the potential types of hazards that may occur. Rock hardness and soil characteristics can determine whether or not an area will be prone to geologic hazards such as earthquakes and landslides. The softest portions of the county are nearest the North Yamhill River and South Yamhill Rivers as well as the eastern border Willamette River in the non-maritime sediment areas. Away from the rivers the soil remains non-maritime sediments but grows stiffer, matching the maritime sediments in the southwestern and rural portion of the county near the Grand Ronde. Maritime Sediments rest at the northern border with Washington County where the soil is very dense and includes soft rocks. The forested northwestern portion of the county high in the coast range includes hard rock areas.¹²

Other Significant Geologic Features

Yamhill County, like most of the Pacific Northwest, lies over the area of the Cascadia Subduction Zone where the North American crustal plate overrides the Juan de Fuca plate underneath the earth's crust. The fault along these two plates creates a structural sag at the Willamette River Valley. Volcanoes are present along this structural sag, and the activity on these mountains is caused by the buoyant melted rock of the Juan de Fuca plate, as it rises to the surface.

Synthesis

This natural environment capacity section is composed of elements known as natural capital. Natural capital is essential in sustaining all forms of life including human life and plays an often under represented role in community resiliency to natural hazards. The growing population and increased development in Yamhill County increases its risk from natural hazard events by threatening loss of life, property, and long-term economic disruption.

With mild temperatures and diverse terrain, the most typical natural hazards that affect Yamhill County are earthquakes, widespread heavy rain events followed by major flood events, and wildfires. With eminent hazard events such as these it is important that the county is able to react in the event that the county's needs are met, such as having an adequate water supply, supplied by several of the major rivers flowing throughout the county.

Highlighting natural capitals, such as key river systems, as well as climate and weather patterns will allow the county to identify key hazard areas that need to be better prepared

¹⁰ "Willamette Valley Land Use/Land Cover Map Informational Report," Pg. 30. Accessed 6 September 2019. <https://digital.osl.state.or.us/islandora/object/osl%3A18785>.

¹¹ Ibid.

¹² Loy, W. G., ed. 2001. *Atlas of Oregon*, 2nd Edition. Eugene, OR: University of Oregon Press.

for and mitigated to increase the resiliency of each community. The coming sections will address the demographics and social geography necessary to consider for the county's disaster mitigation.

Social/Demographic Capacity

Social/demographic capacity is a significant indicator of community hazard resilience. The characteristics and qualities of the community population such as language, race and ethnicity, age, income, educational attainment, and health are significant factors that can influence the community's ability to cope, adapt to and recover from natural disasters. Population vulnerabilities can be reduced or eliminated with proper outreach and community mitigation planning.

Population

Since 2014, Portland State University's Population Research Center has created coordinated population estimates for counties and cities across the state. According to the most recent estimates (2018), Yamhill County's population has grown steady with the State of Oregon's, if a bit under the State's total.

Yamhill's population center, McMinnville, is in the center of the county between the valley and the foothills to the coastal range. The most rural areas of the county include the southwestern corner where Willamina and the two CDPs in the county line up along the border with Polk County, and the northwestern corner in the forests of the foothills where Carlton and Yamhill are the population hubs. Newberg, the second largest city in the county, lies in the northeast corner of the county on the way to Portland. It's worth noting that the unincorporated areas of the county are growing faster than the cities.¹³

Table C-2 Population Estimates and Change (2012 and 2018)

Jurisdiction	2012		2018		Change (2012-2018)		
	Number	Percent	Number	Percent	Number	Percent	AAGR
Oregon	3,883,735	100%	4,195,300	100%	311,565	8%	1.3%
Yamhill County	100,550	3%	107,415	3%	6,865	7%	1.1%
Incorporated	76,205	76%	80,140	75%	3,935	5%	0.8%
Amity	1,610	2%	1,655	2%	45	3%	0.5%
Carlton	2,035	2%	2,270	2%	235	12%	1.8%
Dayton	2,535	3%	2,720	3%	185	7%	1.2%
Dundee	3,175	3%	3,230	3%	55	2%	0.3%
Lafayette	3,735	4%	4,105	4%	370	10%	1.6%
McMinnville	32,435	32%	33,810	31%	1,375	4%	0.7%
Newberg	22,300	22%	23,795	22%	1,495	7%	1.1%
Sheridan	6,180	6%	6,190	6%	10	0%	0.0%
Willamina (part)	1,180	1%	1,275	1%	95	8%	1.3%
Yamhill	1,020	1%	1,090	1%	70	7%	1.1%
Unincorporated	24,345	24%	27,275	25%	2,930	12%	1.9%

Source: Portland State University, Population Research Center, "Annual Population Estimates", 2018 and 2012.
Notes: Part of Willamina is in Polk County (41% of population); total population in 2018 is 2,160.

¹³ Portland State University, Population Research Center, "Annual Population Estimates", 2018 and 2012.

Tourists

Tourists are not counted in population statistics and are therefore considered separately in this analysis. The table below shows the estimated number of person nights in private homes, hotels and motels, and other types of accommodations. According to the table between the years 2016-2018 approximately 62% of all visitors to Yamhill County lodged in private homes while 20% stayed in hotels/motels. The remaining visitors stay on other accommodations such as vacation homes or campgrounds. Lodging in private homes suggests staying with family and friends. For hazard preparedness and mitigation purposes, outreach to residents in Yamhill County will likely need to be transferred to these visitors in some capacity. Visitors staying at hotel/motels are less likely to benefit from local preparedness outreach efforts aimed at residents.

Table C-3 Annual Visitor Estimates in Person Nights

	2016		2017		2018	
	Person-Nights (1,000's)	Percent	Person-Nights (1,000's)	Percent	Person-Nights (1,000's)	Percent
All Overnight	1,683	100%	1,706	100%	1,773	100%
Hotel/Motel	539	32%	551	32%	592	33%
Private Home	1,050	62%	1,061	62%	1,087	61%
Other	95	6%	94	6%	95	5%

Source: Dean Runyan Associates. (2019, March). Oregon Travel Impacts: Statewide Estimates 1992-2018p. Web. http://www.deanrunyan.com/doc_library/ORImp.pdf. Page 204.

Tourists are specifically vulnerable due to the difficulty of locating or accounting for travelers within the region. Tourists are often at greater risk during a natural disaster because of a lack of familiarity with evacuation routes, communication outlets, or even knowledge of the types of hazards likely to occur. Knowing whether the region’s visitors are staying private homes, in hotels/motels, or elsewhere can be instructive in developing outreach efforts.¹⁴

Vulnerable Populations

Vulnerable populations- including seniors, disabled citizens, women, children, and those living in poverty- often experience the impacts of natural hazards and disasters more acutely. Hazard mitigation that targets the specific needs of these groups has the potential to greatly reduce their vulnerability. Examining the reach of hazard mitigation policies to special needs populations may assist in increasing access to services and programs. FEMA’s Office of Equal Rights addresses this need by suggesting that agencies and organizations planning for natural hazards identify special needs populations, make recovery centers more accessible, and review practices and procedures to remedy any discrimination in relief application or assistance.

Population size itself is not an indicator of vulnerability. More important is the location, composition, and capacity of the population within the community. Research demonstrates

¹⁴ MDC Consultants (n.d.). When Disaster Strikes – Promising Practices. Retrieved March 18, 2014.

that human capital indicators such as language, race, age, income, education and health can affect the integrity of a community. Therefore, these human capitals can impact community resilience to natural hazards.

Language

Special consideration should be given to populations who do not speak English as their primary language. Language barriers can be a challenge when disseminating hazard planning and mitigation resources to the general public, and it is less likely they will be prepared if special attention is not given to language and culturally appropriate outreach techniques.

There are various languages spoken across Yamhill County; the primary language is English. Approximately 14% of the Yamhill County population speaks a language other than English, Spanish is the second most widely spoken language with about 12% of the population 5 years and over speaking Spanish.¹⁵ Overall, about 5% of the Yamhill County population is not proficient in English (Table C-4). Lafayette has far and beyond the highest percentage of residents who have limited or no English language proficiency (about 14% speak only Spanish). Outreach materials used to communicate with, plan for, and respond to non-English speaking populations should take into consideration the language needs of these populations.

Table C-4 Yamhill County Language Barriers

Jurisdiction	Population 5 years and over	English Only		Multiple Languages		Limited or No English	
		Number	Percent	Number	Percent	Number	Percent
Yamhill County	96,453	82,592	86%	13,861	14%	5,171	5%
Incorporated	73,957	61,506	83%	12,451	17%	4,906	7%
Amity	1,506	1,381	92%	125	8%	8	1%
Carlton	1,868	1,705	91%	163	9%	19	1%
Dayton	2,431	1,708	70%	723	30%	172	7%
Dundee	3,025	2,722	90%	303	10%	59	2%
Lafayette	3,821	2,574	67%	1,247	33%	578	15%
McMinnville	30,944	24,622	80%	6,322	20%	2,803	9%
Newberg	21,244	18,573	87%	2,671	13%	1,045	5%
Sheridan	5,823	5,094	87%	729	13%	187	3%
Willamina	2,005	1,905	95%	100	5%	25	1%
Yamhill	1,290	1,222	95%	68	5%	10	1%
Unincorporated	22,496	21,086	94%	1,410	6%	265	1%

Source: American Community Survey, U.S. Census Bureau, 2013-2017 American Community Survey Estimates. Table C16001.

Race and Ethnicity

The impact in terms of loss and the ability to recover may also vary among minority population groups following a disaster. Studies have shown that racial and ethnic minorities can be more vulnerable to natural disaster events. This is not reflective of individual characteristics but historic patterns of inequality along racial or ethnic divides have often

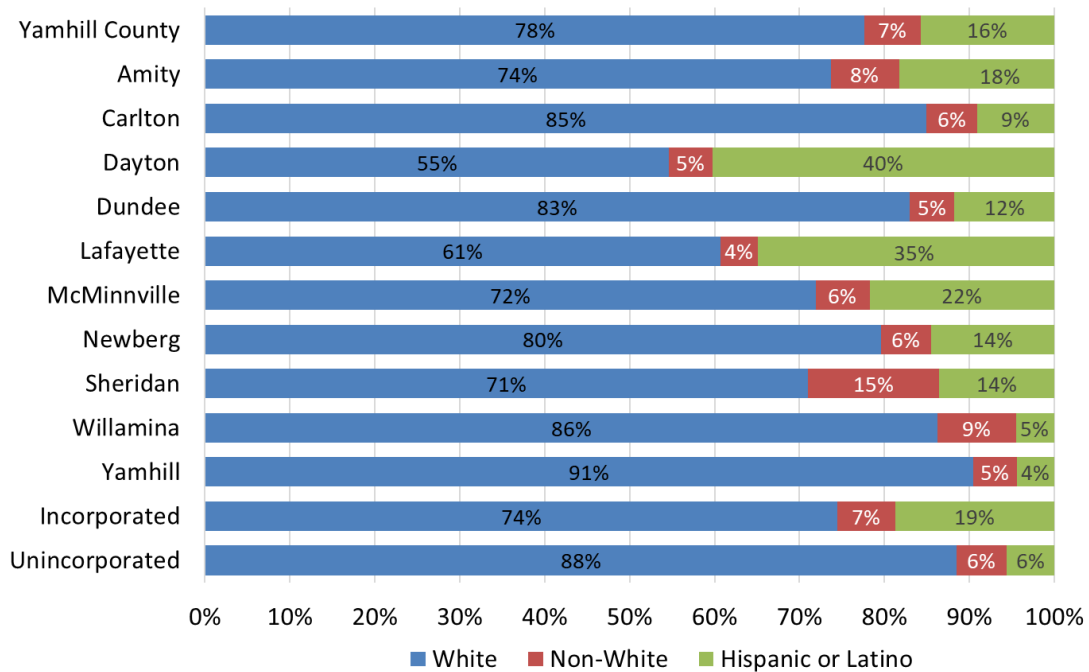
¹⁵ American Community Survey, U.S. Census Bureau, 2013-2017 American Community Survey Estimates. Table C16001.

resulted in minority communities that are more likely to have inferior building stock, degraded infrastructure, or less access to public services. The table below describes Yamhill County’s population by race and ethnicity.

The majority of the population in Yamhill County is racially white (78%); Sheridan has the largest percentages of non-white population at 15%. Dayton and Lafayette have a relatively high population of Hispanic or Latino people of any race at 40% and 35% respectively.

It is important to identify specific ways to support all portions of the community through hazard mitigation, preparedness, and response. Culturally appropriate, and effective outreach can include both methods and messaging targeted to diverse audiences. For example, connecting to historically disenfranchised populations through already trusted sources or providing preparedness handouts and presentations in the languages spoken by the population will go a long way to increasing overall community resilience.

Figure C-2 White, Non-White, and Hispanic or Latino (of any race)



Source: Social Explorer, Table T14, U.S. Census Bureau, 2013-2017 American Community Survey Estimates.

Sex

Yamhill County is almost exactly split 50/50 between males and females.¹⁶ All jurisdictions in the county continue this trend aside from Sheridan whose population is almost 62% male.¹⁷ It is important to recognize that women tend to have more institutionalized obstacles than men during recovery due to sector-specific employment, lower wages, and family care responsibilities.

¹⁶ Social Explorer, U.S. Census Bureau, 2013-2017 American Community Survey Estimates. Table A02002.

¹⁷ Ibid.

Age

Of the factors influencing socio demographic capacity, the most significant indicator in Yamhill County may be age of the population. Depicted in Table C-5 as of 2017, 16% of the county population is over the age of 64, a percentage that is projected to rise to 22% by 2040. The Yamhill County age dependency ratio¹⁸ is 53.6 (Dayton has the largest age dependency ration at 62.6). The age dependency ratio indicates a higher percentage of dependent-aged people compared to that of working age. The age dependency ratio for Yamhill County is expected to rise to 66.8 in 2040, largely because of the rise in the older age cohorts. With a higher age-dependency ratio there will be fewer people of working age who can support mitigation and recovery from a natural disaster. As the population ages the county may need to consider changing mitigation and preparedness actions to address the specific needs of this group.

Table C-5 Population by Vulnerable Age Groups

Jurisdiction	Total	< 15 Years Old		15 to 64 Years Old		>64 Years Old		Age Dependency Ratio
		Number	Percent	Number	Percent	Number	Percent	
Yamhill County	102,366	19,485	19%	66,647	65%	16,234	16%	53.6
Incorporated	79,154	16,096	20%	51,938	66%	11,120	14%	52.4
Amity	1,698	427	25%	1,077	63%	194	11%	57.7
Carlton	1,937	445	23%	1,280	66%	212	11%	51.3
Dayton	2,597	798	31%	1,517	58%	282	11%	71.2
Dundee	3,205	674	21%	2,217	69%	314	10%	44.6
Lafayette	3,992	883	22%	2,775	70%	334	8%	43.9
McMinnville	33,211	7,180	22%	20,423	61%	5,608	17%	62.6
Newberg	22,898	4,042	18%	15,675	68%	3,181	14%	46.1
Sheridan	6,049	839	14%	4,578	76%	632	10%	32.1
Willamina	2,188	482	22%	1,456	67%	250	11%	50.3
Yamhill	1,379	326	24%	940	68%	113	8%	46.7
Unincorporated	23,212	3,389	15%	14,709	63%	5,114	22%	57.8
2040								
Oregon	5,398,800	904,800	17%	3,301,767	61%	1,192,233	22%	63.5
Yamhill County	142,311	24,641	17%	85,296	60%	32,374	23%	66.8

Source: Social Explorer, U.S. Census Bureau, 2013-2017 American Community Survey Estimates.

Table SE A01001.

Portland State University, Population Research Center, "Population Forecasts", 2017.

The age profile of an area has a direct impact both on what actions are prioritized for mitigation and how response to hazard incidents is carried out. School age children rarely make decisions about emergency management. Therefore, a larger youth population in an area will increase the importance of outreach to schools and parents on effective ways to teach children about fire safety, earthquake response, and evacuation plans. Furthermore, children are more vulnerable to hazards and have few transportation options. Older populations may also have special needs prior to, during, and after a natural disaster. Older populations may require assistance in evacuation due to limited mobility or health issues,

¹⁸ The age dependency ratio is derived by dividing the combined under 15 and 65-and-over populations by the 15-to-64 population and multiplying by 100. A number close to 50 indicates about twice as many people are of working age than non-working age. A number that is closer to 100 implies an equal number of working age population as non-working age population. A higher number indicates greater sensitivity.

they may require special medical equipment or medications, and can lack the social and economic resources needed for post-disaster recovery.¹⁹

Families and Living Arrangements

Two ways the census defines households are by type of living arrangement and family structure. A householder may live in a “family household” (a group related to one another by birth, marriage or adoption living together); in a “nonfamily household” (a group of unrelated people living together); or alone. Table C-6 shows that Yamhill County is predominately comprised of family households (70 %). Of all households, 23% are one-person non-family households (householder living alone). Countywide about 11% of householders live alone and are age 65 or older. McMinnville and Newberg, larger cities with schools and colleges that attract young adults, have a higher percentage of people living alone outside of family households.

Table C-6 Household by Type, Including Living Alone

Jurisdiction	Total Households	Family Households		Householder Living Alone		Householder Living Alone (age 65+)	
	Estimate	Estimate	Percent	Estimate	Percent	Estimate	Percent
Yamhill County	35,952	25,345	70%	8,328	23%	4,024	11%
Incorporated	27,589	18,917	69%	6,750	24%	3,199	12%
Amity	592	439	74%	135	23%	40	7%
Carlton	636	458	72%	119	19%	68	11%
Dayton	748	549	73%	155	21%	55	7%
Dundee	1,068	923	86%	115	11%	53	5%
Lafayette	1,239	980	79%	125	10%	59	5%
McMinnville	12,376	8,156	66%	3,463	28%	1,776	14%
Newberg	8,126	5,450	67%	2,052	25%	862	11%
Sheridan	1,569	1,017	65%	388	25%	219	14%
Willamina	797	574	72%	157	20%	48	6%
Yamhill	438	371	85%	41	9%	19	4%
Unincorporated	8,363	6,428	77%	1,578	19%	825	10%

Source: Social Explorer, U.S. Census Bureau, 2013-2017 American Community Survey Estimates. Table SE A10025.

Table C-7 shows household structures for families with children. Nearly 22% of all households within the county are married family households that have children. Willamina has a noticeably higher percentage of single-parent households than any other place in the county (19%). Such populations will likely require additional support during a disaster and will inflict strain on the system if improperly managed.

¹⁹ Wood, Nathan. Variations in City Exposure and Sensitivity to Tsunami Hazards in Oregon. U.S. Geological Survey, Reston, VA, 2007.

Table C-7 Married-Couple and Single Parent Families with Children

Jurisdiction	Total Households Estimate	Married-Couple with Children		Single Parent with Children	
		Estimate	Percent	Estimate	Percent
Yamhill County	35,952	7,822	22%	3,664	10%
Incorporated	27,589	5,999	22%	3,343	12%
Amity	592	146	25%	77	13%
Carlton	636	209	33%	77	12%
Dayton	748	258	34%	86	11%
Dundee	1,068	288	27%	131	12%
Lafayette	1,239	426	34%	109	9%
McMinnville	12,376	2,486	20%	1,412	11%
Newberg	8,126	1,574	19%	1,031	13%
Sheridan	1,569	331	21%	201	13%
Willamina	797	129	16%	152	19%
Yamhill	438	152	35%	67	15%
Unincorporated	8,363	1,823	22%	321	4%

Source: Social Explorer, U.S. Census Bureau, 2013-2017 American Community Survey Estimates. Table: SE: A10009.

Income

Household income and poverty status are indicators of socio demographic capacity and the stability of the local economy. Household income can be used to compare economic areas but does not reflect how the income is divided among the area residents. Table C-8 shows the distribution of household income for 2012 and 2017. According to Table C-8, income across the county is increasing consistent with inflation.

Table C-8 Household Income

Household Income	2012*		2017		Change in Share	
	Households	Percent	Households	Percent	Households	Percent
Less than \$15,000	3,468	10%	3,275	9%	-193	-1.1%
\$15,000-\$29,999	4,677	14%	4,919	14%	242	-0.1%
\$30,000-\$44,999	5,022	15%	5,333	15%	311	0.0%
\$45,000-\$59,999	4,389	13%	4,835	13%	446	0.5%
\$60,000-\$74,999	3,643	11%	3,945	11%	302	0.2%
\$75,000-\$99,999	4,745	14%	5,006	14%	261	-0.1%
\$100,000-\$199,999	6,801	20%	6,999	19%	198	-0.6%
\$200,000 or more	1,175	3%	1,640	5%	465	1.1%

Source: Social Explorer, U.S. Census Bureau, 2013-2017 & 2008-2012 American Community Survey Estimates. Table SE: A14001.

Note: * - 2012 dollars adjusted for 2017 via Social Explorer's Inflation Calculator.

The 2017 median household income across Yamhill County is \$58,392; this is about the same as the inflation adjusted 2012 figure, representing a 1% increase in real incomes (Table

C-9). Carlton has the highest median household income while Willamina had the greatest gain. Sheridan has by far the lowest median household income though Lafayette’s is the fastest shrinking. The table below shows decreases, or modest gains, in real incomes across most of Yamhill County, with the exception of Willamina’s rapid growth.

Table C-9 Median Household Income

Jurisdiction	Median Household Income		Percent Change
	2012 [^]	2017	
Yamhill County	\$ 57,758	\$ 58,392	1%
Incorporated	\$ 49,314	\$ 53,863	9%
Amity	\$ 52,191	\$ 53,958	3%
Carlton	\$ 59,140	\$ 63,875	8%
Dayton	\$ 48,100	\$ 54,265	13%
Dundee	\$ 74,686	\$ 75,663	1%
Lafayette	\$ 60,939	\$ 57,188	-6%
McMinnville	\$ 44,975	\$ 50,299	12%
Newberg	\$ 58,584	\$ 56,910	-3%
Sheridan	\$ 45,209	\$ 47,372	5%
Willamina	\$ 37,303	\$ 50,174	35%
Yamhill	\$ 78,225	\$ 74,167	-5%
Unincorporated	-	-	-

Source: Social Explorer, U.S. Census Bureau, 2013-2017 American Community Survey Estimates. Table SE: A14006. Note: ^ - 2012 dollars adjusted for 2017 via Social Explorer’s Inflation Calculator.

Table C-10 identifies the percentage of individuals and cohort groups that are below the poverty level in 2017. It is estimated that about 14% of individuals, 20% of children under 18, and 6% of seniors live below the poverty level across the county. As seen in the table Amity, Willamina, and Newberg have the highest poverty rates. Yamhill City’s poverty is noticeably consistent throughout all age groups; however, Sheridan is the only jurisdiction to have an increase in poverty after the age of 65. Carlton, Dundee and Yamhill are the only jurisdictions below the county poverty level (as well as the unincorporated areas).

Cutter’s research suggests that lack of wealth contributes to social vulnerability because individual and community resources are not as readily available. Affluent communities are more likely to have both the collective and individual capacity to more quickly rebound from a hazard event, while impoverished communities and individuals may not have this capacity –leading to increased vulnerability. Wealth can help those affected by hazard incidents to absorb the impacts of a disaster more easily. Conversely, poverty, at both an individual and community level, can drastically alter recovery time and quality.

Table C-10 Poverty Rates

	Total Population in Poverty		Children Under 18 in Poverty		18 to 64 in Poverty		65 or over in Poverty	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Yamhill County	13,334	14%	4,546	20%	7,868	14%	920	6%
Incorporated	11,563	16%	4,051	21%	6,851	15%	661	6%
Amity	320	19%	109	23%	187	19%	24	12%
Carlton	122	6%	44	8%	65	6%	13	6%
Dayton	411	16%	218	24%	162	12%	31	11%
Dundee	240	8%	99	12%	130	6%	11	4%
Lafayette	579	15%	249	23%	300	12%	30	9%
McMinnville	5,173	16%	1,731	22%	3,193	18%	249	5%
Newberg	3,652	17%	1,276	26%	2,220	17%	156	5%
Sheridan	509	12%	176	17%	231	9%	102	18%
Willamina	469	22%	129	24%	303	22%	37	15%
Yamhill	88	7%	20	5%	60	7%	8	7%
Unincorporated	1,771	8%	495	11%	1,017	7%	259	5%

Source: Social Explorer, U.S. Census Bureau, 2013-2017 American Community Survey Estimates. Tables: SE: A13003A, A13003B and A13003C.

Federal assistance programs such as food stamps are another indicator of poverty or lack of resource access. Statewide social assistance programs like the Supplemental Nutritional Assistance Program (SNAP)²⁰ and Temporary Assistance for Needy Families (TANF)²¹ aid individuals and families. In Yamhill County, TANF reaches approximately 8,651 families per month and SNAP helps to feed about 15,929 people per month. Those reliant on state and federal assistance are more vulnerable in the wake of disaster because of a lack of personal financial resources and reliance on government support.

Education

Educational attainment of community residents is also identified as an influencing factor in socio demographic capacity. Educational attainment often reflects higher income and therefore higher self-reliance. Widespread educational attainment is also beneficial for the regional economy and employment sectors as there are potential employees for professional, service and manual labor workforces. An oversaturation of either highly educated residents or low educational attainment can have negative effects on the resiliency of the community.

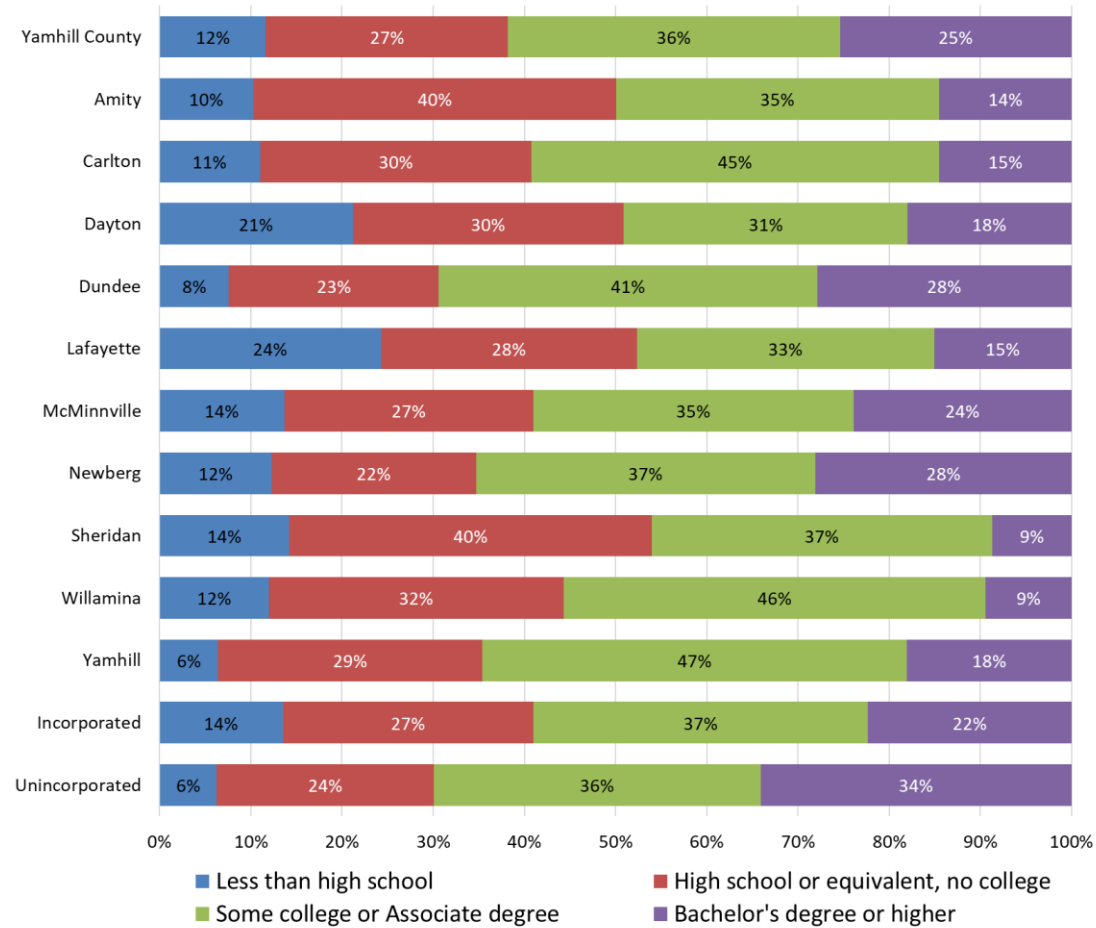
Approximately 12% of the Yamhill County population over 25 years does not have a high school degree or equivalent, the rate is higher within incorporated cities (14%) than in the unincorporated county (6%). Countywide 27% have a high school degree or equivalent but do not have college experience (Figure C-3). Lafayette and Dayton have the lowest

²⁰ Statewide Supplemental Nutrition Assistance Program Activity - Nov. 2014 (SSP, APD, and AAA combined); P. 3 of report. Temporary Assistance for Needy Families One and two Parent Families Combined; P. 3 of report. <http://www.oregon.gov/dhs/assistance/Pages/data/main.aspx>

²¹ Sabatino, J. (2016). Oregon TANF Caseload FLASH, "One and Two Parent Families Combined", District 15; February 2018 data, and Sabatino, J. (2018). Oregon SNAP Program Activity, "SSP, APD and AAA Combined", District 15; February 2018 data. Retrieved from State of Oregon Office of Business Intelligence website: <http://www.oregon.gov/DHS/ASSISTANCE/Pages/Data.aspx>, accessed March 21, 2018.

percentages of high school graduates. Dundee and Newberg have the highest percentages of people with a bachelor's degree or higher.

Figure C-3 Educational Attainment



Source: Social Explorer, U.S. Census Bureau, 2013-2017 American Community Survey Estimates. Table: SE: A12001.

Health

Individual and community health play an integral role in community resiliency, as indicators such as health insurance, people with disabilities, dependencies, homelessness and crime rate paint an overall picture of a community's well-being. These factors translate to a community's ability to prepare, respond to, and cope with the impacts of a disaster.

The Resilience Capacity Index recognizes those who lack health insurance or are impaired with sensory, mental or physical disabilities, have higher vulnerability to hazards and will likely require additional community support and resources. 8% of Yamhill County's population lacks health insurance; Lafayette (14 %) and Willamina (10 %) have the highest percentages. The percentage of uninsured changes with age, the highest rates of uninsured are within the 18 to 64-year cohort; Lafayette and Willamina lead in this category as well

with Amity not far behind. The need to provide services to the uninsured populations may burden local providers following a natural disaster.

Table C-11 Health Insurance Coverage

Jurisdiction	Total Population	Without Health Insurance							
		Total		Under 18 years		18 to 64 years		65+	
		Number	Percent	Number	Percent	Number	Percent	Number	Percent
Yamhill County	100,149	7,743	8%	665	3%	7,010	12%	68	< 1%
Incorporated	76,937	6,629	9%	529	3%	6,033	13%	67	1%
Amity	1,698	159	9%	14	3%	145	15%	0	0%
Carlton	1,937	138	7%	0	0%	138	12%	0	0%
Dayton	2,597	182	7%	46	5%	136	10%	0	0%
Dundee	3,205	219	7%	13	2%	206	10%	0	0%
Lafayette	3,992	543	14%	57	5%	486	20%	0	0%
McMinnville	32,865	2,624	8%	145	2%	2,431	13%	48	1%
Newberg	22,794	2,125	9%	178	3%	1,928	14%	19	< 1%
Sheridan	4,282	348	8%	58	5%	290	11%	0	0%
Willamina	2,188	219	10%	8	1%	211	16%	0	0%
Yamhill	1,379	72	5%	10	2%	62	8%	0	0%
Unincorporated	23,212	1,114	5%	136	3%	977	7%	1	< 1%

Source: Social Explorer, U.S. Census Bureau, 2013-2017 American Community Survey Estimates. Table: SE: A20002

Table C-12 describes disability status of the population. Approximately 16% of the Yamhill County civilian non-institutionalized population identifies with one or more disabilities. Willamina has the highest percentage of its total population with a disability (22%). Amity has an unusually high number of seniors with a disability at 57%, more than double Carlton’s despite similar population size.

Table C-12 Disability Status by Age Group

Jurisdiction	Population Estimate^	With a disability		Under 18 years with a disability		65 years and over with a disability	
		Estimate	Percent	Estimate	Percent	Estimate	Percent
Yamhill County	100,149	15,748	16%	1,337	6%	6,436	40%
Incorporated	76,937	12,222	16%	1,146	6%	4,576	42%
Amity	1,698	343	20%	20	4%	111	57%
Carlton	1,937	257	13%	29	5%	48	23%
Dayton	2,597	329	13%	57	6%	116	41%
Dundee	3,205	432	13%	35	4%	153	49%
Lafayette	3,992	530	13%	32	3%	139	42%
McMinnville	32,865	5,687	17%	602	7%	2,108	39%
Newberg	22,794	3,112	14%	261	5%	1,479	47%
Sheridan	4,282	851	20%	60	6%	252	44%
Willamina	2,188	490	22%	34	6%	115	46%
Yamhill	1,379	191	14%	16	4%	55	49%
Unincorporated	23,212	3,526	15%	191	4%	1,860	36%

Source: American Community Surveys, U.S. Census Bureau, 2013-2017 American Community Survey Estimates. Table: ACS: B18101.

Table C-13 displays disability status of the population by type and age. Older populations tend to have more disabilities than younger populations in Yamhill County. Approximately 23% of the population 65 and over has an ambulatory disability, 20% have a hearing

disability, and 15% have an independent living disability.²² Depending on the type of disability outreach, mitigation, and response efforts may need to be adjusted.

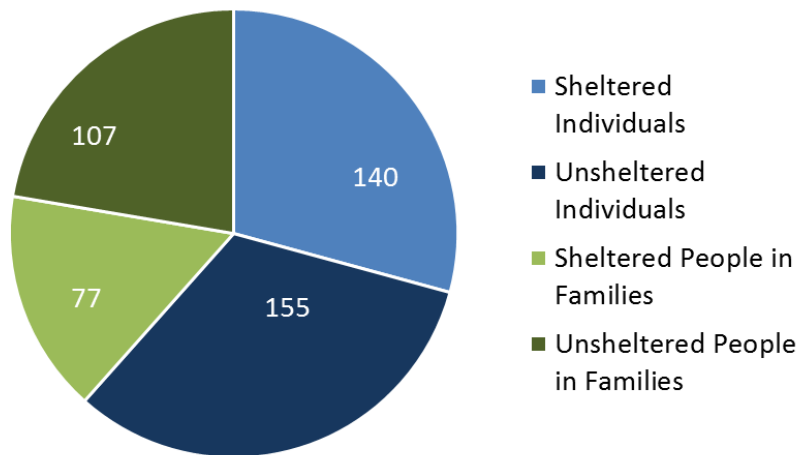
Table C-13 Disability Type by Age Group – Yamhill County

	Hearing Disability	Vision Disability	Cognitive Disability	Ambulatory Disability	Self-Care Disability	Independent Living Disability
Total Population	5%	3%	6%	8%	3%	6%
Under 18	1%	1%	5%	1%	1%	-
18 to 64	3%	2%	6%	6%	2%	4%
65 and over	20%	7%	9%	23%	9%	15%

Source: American Community Surveys, U.S. Census Bureau, 2013-2017 American Community Survey Estimates.
Table: ACS: B18102- B18107

In 2017, Oregon Housing and Community Services (OHCS) conducted a point-in-time homeless count to identify the number of homeless, their age and their family type. The OHCS study found that 497 individuals and persons in families in Yamhill County identify as homeless; 30%, 151 people, were sheltered (84 individuals and 67 persons in families), and 70%, 346 people, were unsheltered (301 individuals and 45 persons in families).

Figure C-4 Yamhill County PIT Homeless Count (2017)



Source: Oregon Housing and Community Services- Profile. (2018, January). Point-in-Time Count Yamhill County.

The homeless have little resources to rely on, especially during an emergency. It will likely be the responsibility of the county, cities, and local non-profit entities to provide services such as shelter, food and medical assistance. Therefore, it is critical to foster collaborative relationships with agencies that will provide additional relief such as the American Red Cross and homeless shelters. It will also be important to identify how to communicate with these populations, since traditional means of communication may not be appropriate or available.

²² American Community Surveys, U.S. Census Bureau, 2013-2017 American Community Survey Estimates. Web. <https://www.sociaexplorer.com/explore-tables>. ACS: B18102- B18107

Household Characteristics – Vehicles Available

Countywide 5% of all occupied households and 11% of renter-occupied households have no vehicle available (Table C-14). The percentage of all households without a vehicle available is greatest in Sheridan (9%). In renter occupied households the percentage is greatest in Sheridan (18%), Dayton (17%), and Lafayette (16%). Household access to a vehicle is key to evacuating quickly and safely. Households that have no access to a vehicle or limited vehicles available may face delays, or need assistance, to evacuate.

Table C-14 Vehicles Available (All Households and Renter Occupied)

Jurisdiction	Occupied Housing			Renter Occupied Housing		
	Housing Units	No Vehicle (Percent)	One Vehicle (Percent)	Housing Units	No Vehicle (Percent)	One Vehicle (Percent)
Yamhill County	35,952	5%	29%	11,524	11%	43%
Incorporated	27,589	6%	33%	10,104	11%	45%
Amity	592	3%	29%	229	8%	37%
Carlton	636	2%	18%	147	1%	25%
Dayton	748	6%	25%	207	17%	35%
Dundee	1,068	2%	17%	169	4%	23%
Lafayette	1,239	4%	16%	180	16%	35%
McMinnville	12,376	6%	37%	5,014	11%	51%
Newberg	8,126	5%	34%	3,103	12%	43%
Sheridan	1,569	9%	27%	643	18%	40%
Willamina	797	6%	30%	309	12%	35%
Yamhill	438	2%	14%	103	5%	19%
Unincorporated	8,363	2%	15%	1,420	6%	25%

Source: Social Explorer, U.S. Census Bureau, 2013-2017 American Community Survey Estimates. Table: SE: A10030 and A10054B.

Synthesis

Socio-demographic capacity is a significant indicator of county hazard resiliency. The characteristics and qualities of the community population such as age, race, education, income, and health and safety are significant factors that can influence the county's ability to cope, adapt to, and recover from natural disasters. The current status of socio-demographic capacity indicators can have long term impacts on the economy and stability ultimately affecting future resiliency of Yamhill County.

One important thing to consider is that there are a high number of residents who are not proficient in English. Five percent (over 5,000) residents are not proficient in English. Language barriers will often make it difficult to reach populations of residents who don't speak English. Resiliency efforts need to focus on targeting these populations as they will be most vulnerable and may have trouble knowing what to do in the event of a disaster. It is also important to think about the county's population in terms of its age groups; it is important to cater information towards each of these populations individually, as it is necessary to be able to reach out to all age groups. In 2017 the percentage of residents age 65 and older was 16%; by 2040 that percentage is expected to increase to 22%. While disasters don't affect certain age groups more than others, information can be dispersed and catered depending on who may be the most vulnerable.

Yamhill County socio-economic factors to consider include:

- With 1% growth from 2012 to 2017, the median household income across the county has increased to \$58,392.
- 14% of the population is considered in poverty; the rates are highest in Willamina, Amity, and Newberg (followed closely by Dayton).
- Children in poverty is greatest in Newberg, Dayton, Willamina, and Amity while those 65 or over in poverty is greatest in Sheridan.
- Over 15% of the population has a disability, including 40% of 65-year-old citizens

Highlighting the above socio-economic factors and looking at the Socio Demographic Capacity of the county is important as it affects the resiliency of the county and helps determine target areas and potential vulnerable populations for increased notification on mitigation and resiliency efforts.

Economic Capacity

Economic capacity refers to the financial resources present, and revenue generated in the community to achieve a higher quality of life. Income equality, housing affordability, economic diversification, employment and industry are measures of economic capacity. However, economic resilience to natural disasters is far more complex than merely restoring employment or income in the local community. Building a resilient economy requires an understanding of how the component parts of employment sectors, workforce, resources and infrastructure are interconnected in the existing economic picture. Once any inherent strengths or systematic vulnerabilities become apparent, both the public and private sectors can act to increase the resilience of the local economy.

Regional Affordability

The evaluation of regional affordability supplements the identification of Social/demographic capacity indicators, i.e. median income, and is a critical analysis tool to understanding the economic status of a community. This information can capture the likelihood of individuals' ability to prepare for hazards, through retrofitting homes or purchasing insurance. If the community reflects high-income inequality or housing cost burden, the potential for homeowners and renters to implement mitigation can be drastically reduced. Therefore, regional affordability is a mechanism for generalizing the abilities of community residents to get back on their feet without Federal, State or local assistance.

Income Equality

Income equality is a measure of the distribution of economic resources, as measured by income, across a population. It is a statistic defining the degree to which all persons have a similar income. The table below illustrates the county and cities level of income inequality. The Gini index is a measure of income inequality. The index varies from zero to one. A value

of one indicates perfect inequality (only one household has any income). A value of zero indicates perfect equality (all households have the same income).²³

Table C-15 shows that the countywide income inequality coefficient is 0.44. The City with the greatest income inequality is McMinnville (0.45). The remaining cities have relatively the same income equality within each city, however, countywide income inequality between cities is higher. Cities with the greatest income equality are Carlton (0.33) and Lafayette (0.35). Research shows a region’s cohesive response to a hazard event may be affected by the distribution of wealth in communities that have less income equality²⁴.

Table C-15 Regional Income Inequality

Jurisdiction	Income Inequality Coefficient
Yamhill County	0.44
Amity	0.37
Carlton	0.33
Dayton	0.38
Dundee	0.37
Lafayette	0.35
McMinnville	0.45
Newberg	0.39
Sheridan	0.36
Willamina	0.36
Yamhill	0.37

Source: Social Explorer, U.S. Census Bureau, 2013-2017 American Community Survey Estimates. Table: SE: A14028

Housing Affordability

Housing affordability is a measure of economic security gauged by the percentage of an area’s households paying less than 30% of their income on housing.²⁵ Households spending more than 30% are considered housing cost burdened. Table C-16 displays the percentage of homeowners and renters reflecting housing cost burden across the region.

Countywide roughly 22% of homeowners with a mortgage have a housing cost burden, compared to over 50% of renters. No communities in the county have more than 50% of owners (with or without a mortgage) with a housing cost burden whereas amongst renters every jurisdiction except for Amity, Carlton, and Yamhill City have more than 50% with a housing cost burden. In general populations that spends more of their income on housing has proportionally fewer resources and less flexibility for alternative investments in times of crisis.²⁶ This disparity imposes challenges for a community recovering from a disaster as housing costs may exceed the ability of local residents to repair or move to a new location.

²³University of California Berkeley. Building Resilient Regions, Resilience Capacity Index..

²⁴ Susan Cutter, Christopher G. Burton, and Christopher T. Emrich. 2010. “Disaster Resilience Indicators for Benchmarking Baseline Conditions,” Journal of Homeland Security and Emergency Management 7, no.1: 1-22

²⁵ University of California Berkeley. Building Resilient Regions, Resilience Capacity Index.

²⁶ Ibid.

These populations may live paycheck to paycheck and are extremely dependent on their employer, in the event their employer is also impacted it will further the detriment experienced by these individuals and families.

Table C-16 Households Spending > 30% of Income on Housing

Jurisdiction	Owners		Renters
	With Mortgage	Without Mortgage	
Yamhill County	22%	4%	50%
Incorporated	22%	4%	52%
Amity	23%	2%	32%
Carlton	25%	8%	42%
Dayton	24%	3%	51%
Dundee	30%	3%	50%
Lafayette	31%	1%	52%
McMinnville	16%	5%	51%
Newberg	29%	3%	55%
Sheridan	14%	5%	54%
Willamina	20%	1%	58%
Yamhill	16%	2%	30%
Unincorporated	21%	4%	40%

Source: Social Explorer, U.S. Census Bureau, 2013-2017 American Community Survey Estimates. Table: SE: A10040 and A18002.

Economic Diversity

Economic diversity is a general indicator of an area’s fitness for weathering difficult financial times. Business activity in the Willamette Valley region is fairly homogeneous and consists mostly of small businesses.

Economic diversity is a general indicator of an area’s fitness for weathering difficult financial times. One method for measuring economic diversity is through use of the Herfindahl Index, a formula that compares the composition of county and regional economies with those of states or the nation as a whole. Using the Herfindahl Index, a diversity ranking of 1 indicates the county with the most diverse economic activity compared to the state as a whole, while a ranking of 36 corresponds with the least diverse county economy. The table below describes the Herfindahl Index Scores for counties in the region.

Table C-17 shows that Yamhill County ranks seventh in economic diversity as of 2016, this is on a scale between all 36 counties in the state where 1 is the most diverse economic county in Oregon and 36 is the least diverse. The county’s ranking has stayed relatively consistent since 2013.

Table C-17 Regional Herfindahl Index Scores

County	2013			2016		
	Employment	Number of Industries	State Rank	Employment	Number of Industries	State Rank
Yamhill	27,860	209	6	29,884	217	7
Clackamas	132,209	266	1	140,827	274	1
Marion	105,758	252	3	101,571	245	3
Polk	12,837	178	18	12,179	167	9
Tillamook	6,908	146	24	6,687	150	24
Washington	235,258	261	16	260,196	261	18

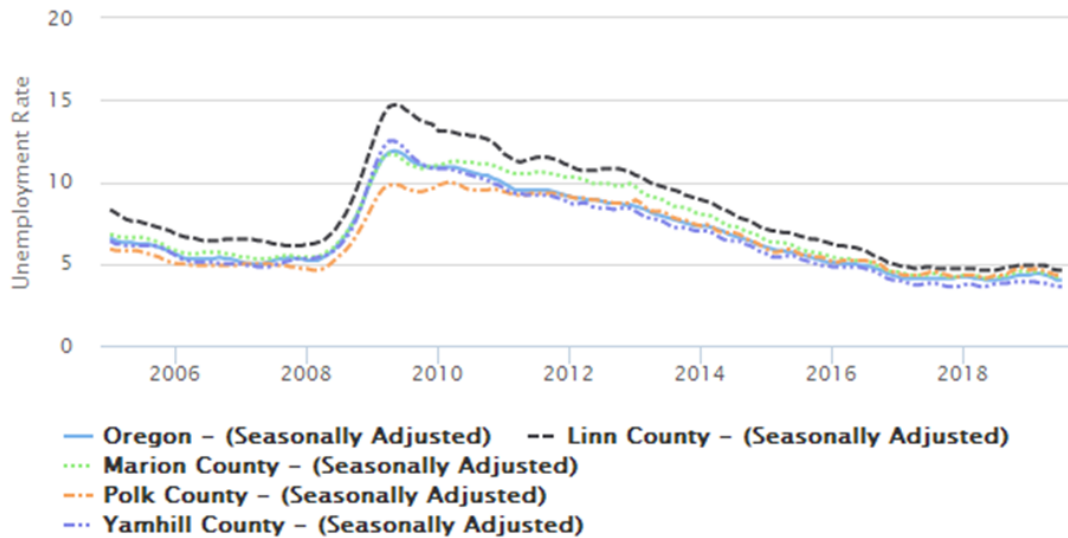
Source: Oregon Employment Department

While illustrative, economic diversity is not a guarantor of economic vitality or resilience. As of 2019 Yamhill County is not listed as an economically distressed community as prescribed by Oregon Law. The economic distress measure is based on indicators of decreasing new jobs, average wages and income, and is associated with an increase of unemployment.²⁷

Employment and Wages

According to the Oregon Employment Department (Figure C-5), unemployment has declined since 2009 (10.9%) and remains at a rate similar to the State of Oregon and other counties in the region (3.8%).

Figure C-5 Unemployment Rate



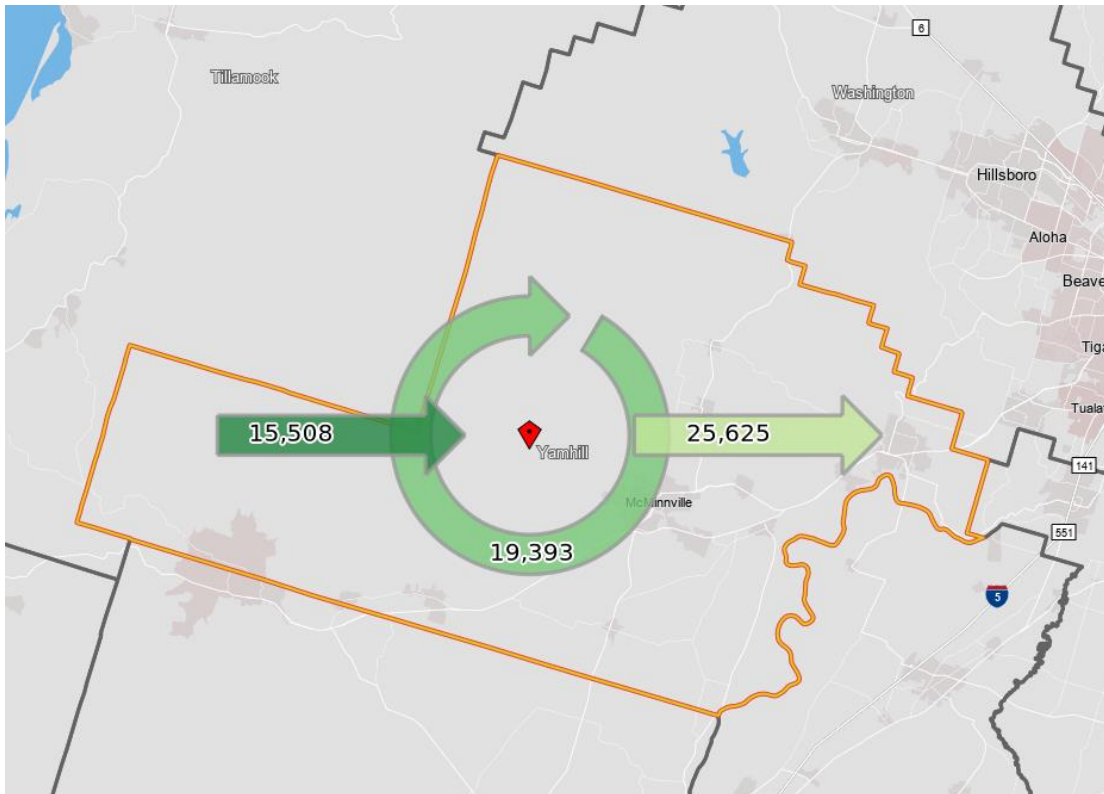
²⁷ Business Oregon – Oregon Economic Data “Distressed Communities List”, <http://www.oregon4biz.com/Publications/Distressed-List/>

Labor and Commute Shed

Most hazards can happen at any time during the day or night. It may be possible to give advance warning to residents and first responders who can take immediate preparedness and protection measures, but the variability of hazards is one part of why they can have such varied impact. A snowstorm during the workday will have different impacts than one that comes during the night. During the day, a hazard has the potential to segregate the population by age or type of employment (e.g., school children at school, office workers in downtown areas). This may complicate some aspects of initial response such as transportation or the identification of wounded or missing. Conversely, a hazard at midnight may occur when most people are asleep and unable to receive an advance warning through typical communication channels. The following laborshed and commute shed analysis is intended to document where county residents work and where people who work in Yamhill County reside.

Yamhill County employers draw in more than 44% (15,508) of their workers from outside the county. Figure C-6 shows the county's laborshed; the map shows that about 43% of workers live and work in the county (19,393) and about 57% of residents work outside of the county (25,625).

Figure C-6 Yamhill County Laborshed



Source: U.S. Bureau of the Census, [On the Map](#).

Table C-18 shows commuting patterns for workers who reside in Yamhill County. Over half of Yamhill County employed residents work outside of the County; 35% work in the three counties surrounding the Portland Metro area (21% work in Washington County).

Table C-18 Commute Shed (Where Workers are Employed who Live in Yamhill County), 2017

Jurisdiction	Number of Jobs	Share
All Jurisdictions	45,018	100%
Yamhill Co.	19,393	43%
Washington Co.	9,385	21%
Marion Co.	4,007	9%
Multnomah Co.	3,763	8%
Clackamas Co.	2,861	6%
Polk Co.	1,256	3%
Lane Co.	692	2%
Linn Co.	607	1%
Benton Co.	454	1%
Deschutes Co.	287	1%
All other Locations	2,313	5%

Source: U.S. Bureau of the Census, [On The Map](#).

Table C-19 shows where workers live who work in Yamhill County. Approximately 44% of Yamhill County workers live outside of the County; 21% live in the four counties (including Clark Co., WA) surrounding the Portland Metro area (11% live in Washington County). Almost The remaining 23% of workers are spread across other regions outside the county.

Table C-19 Labor Shed (Where Workers Live who are Employed in Yamhill County), 2017

Jurisdiction	Number of Jobs	Share
All Jurisdictions	34,901	100%
Yamhill Co.	19,393	56%
Clackamas Co.	3,796	11%
Marion Co.	2,528	7%
Polk Co.	1,639	5%
Washington Co.	1,615	5%
Multnomah Co.	1,552	4%
Lane Co.	521	1%
Benton Co.	390	1%
Clark Co. (WA)	363	1%
Linn Co.	341	1%
All other Locations	2,763	8%

Source: U.S. Bureau of the Census, [On The Map](#).

Workers can be impacted during a disaster to varying levels based upon their means of transportation to work. Commuters who use motorized vehicles and public transportation that rely upon maintained roads, bridges, and other infrastructure may be delayed or unable to travel if infrastructure is impacted during an event (for example, earthquakes or heavy winter storms). Table C-20 shows that 87% of Yamhill County commuters utilized motorized vehicles (cars, trucks, vans, or motorcycles) and an additional 1% use public transportation. 6% of commuters bike or walk to work and 6% work from home. Dayton and the unincorporated areas of the county have the highest percentage of workers who work from home by population.

Table C-20 Means of Transportation to Work

Jurisdiction	Workers (16 and older)	Motorized Vehicle [^] (Percent)	Public Transportation (Percent)	Bike/Walked (Percent)	Other (Percent)	Worked at Home (Percent)
Yamhill County	45,285	87%	1%	6%	0%	6%
Incorporated	34,888	88%	1%	7%	1%	4%
Amity	633	93%	0%	1%	0%	5%
Carlton	890	92%	0%	2%	0%	6%
Dayton	947	87%	0%	3%	0%	10%
Dundee	1,682	92%	1%	3%	0%	5%
Lafayette	1,999	93%	3%	1%	0%	3%
McMinnville	14,192	87%	0%	1%	1%	3%
Newberg	11,144	84%	1%	8%	0%	5%
Sheridan	1,848	90%	1%	9%	2%	2%
Willamina	874	93%	0%	5%	1%	1%
Yamhill	679	92%	1%	2%	1%	4%
Unincorporated	10,397	80%	0%	3%	0%	10%

Source: Social Explorer, U.S. Census Bureau, 2013-2017 American Community Survey Estimates. Table: SE: A09005.

Mitigation activities are needed at the business level to ensure the health and safety of workers and limit damage to industrial infrastructure. Employees are highly mobile, commuting from all over the surrounding area to industrial and business centers. As daily transit rises, there is an increased risk that a natural hazard event will disrupt the travel plans of residents across the region and seriously hinder the ability of the economy to meet the needs of Yamhill County residents and businesses.

Industry

Key industries are those that represent major employers and are significant revenue generators. Different industries face distinct vulnerabilities to natural hazards, as illustrated by the industry specific discussions below. Identifying key industries in the region enables communities to target mitigation activities towards those industries' specific sensitivities. It is important to recognize that the impact that a natural hazard event has on one industry can reverberate throughout the regional economy.

This is of specific concern when the businesses belong to the basic sector industry. Basic sector industries are those that are dependent on sales outside of the local community; they bring money into a local community via employment. The farm and ranch, information, and wholesale trade industries are all examples of basic industries. Non-basic sector industries

are those that are dependent on local sales for their business, such as retail trade, construction, and health services.

Employment by Industry

Economic resilience to natural disasters is particularly important for the major employment industries in the region. If these industries are negatively impacted by a natural hazard, such that employment is affected, the impact will be felt throughout the regional economy. Thus, understanding and addressing the sensitivities of these industries is a strategic way to increase the resiliency of the entire regional economy.

Table C-21 identifies Employment by industry. The industry sectors in Yamhill County with the highest percentage of the workforce are Manufacturing (19.0%), Education and Health Services (17.6%), and Trade, Transportation & Utilities (13.3%; Retail Trade accounts for 10.3% of this category).

Table C-21 Total Non-Farm Employment by Industry 2018, Expected Growth 2027

Employment Sector	2018				Percent Change in Employment (2013-2018)	Employment Forecast (2017-2027)
	Firms	Employees	Percent Workforce	Average Wage		
Total Payroll Employment	3,260	36,324	100%	\$42,309	13%	12%
Total Private	3,142	32,140	88.5%	\$41,208	15%	13%
Natural Resources and Mining	204	3,669	10.1%	\$37,837	18%	14%
Construction	358	1,977	5.4%	\$51,966	69%	20%
Manufacturing	287	6,896	19.0%	\$52,328	8%	9%
Trade, Transportation & Utilities	487	4,829	13.3%	\$35,726	9%	12%
Wholesale Trade	139	629	1.7%	\$62,411	16%	11%
Retail Trade	278	3,732	10.3%	\$29,971	15%	9%
Information	44	242	0.7%	\$54,512	44%	6%
Financial Activities	223	1,007	2.8%	\$54,405	5%	5%
Professional and Business Services	393	1,940	5.3%	\$48,464	13%	11%
Education and Health Services	311	6,392	17.6%	\$43,299	15%	19%
Leisure and Hospitality	258	3,792	10.4%	\$20,279	23%	13%
Other Services	556	1,386	3.8%	\$24,067	12%	10%
Private Non-Classified	21	9	0.0%	\$51,294	-31%	-
Government	118	4,184	11.5%	\$50,765	-3%	7%
Federal	16	440	1.2%	\$74,467	-6%	0%
State	11	211	0.6%	\$52,984	-50%	9%
Local	91	3,532	9.7%	\$47,694	3%	5%

Source: State of Oregon Employment Department. (2018). Employment and Wages by Industry (QCEW). Web. <https://www.qualityinfo.org/ed-ewind/?at=1&t1=0~4104000071~00~3~0000~00~00000~2018~00>

Basic industries encourage growth in non-basic industries and bring wealth into communities from outside markets. However, a high dependence on basic industries can lead to severe difficulties when recovering from a natural disaster if vital infrastructure or primary resource concentrations have been greatly damaged. While Yamhill County has some basic industries, such as Manufacturing five out of the six largest industrial sectors are of the non-basic nature and thus they rely on local sales and services. Trending towards basic industries can lead to higher community resilience.

Future Employment in Industry

Table C-211 shows that between 2013 and 2018, the sectors that experienced the largest percent growth were Construction (69%), Information (44%), and Leisure and Hospitality (23%). Some of these sectors often require more training and education, while others require less education and have lower wages.

Sectors that are anticipated to be major employers in the future also warrant special attention in the hazard mitigation planning process. Table C-21 shows that between 2017 and 2027 the largest employment growth in the region is anticipated within Construction (20%), Education and Health Services (19%), and Natural Resources and Mining (14%). Mitigation activities that respond to the needs of these sectors may help to ensure the resilience of the economy and help the community stay open for business following a disaster.

High Revenue Sectors

Table C-22 shows the revenue generated by each reported economic sector (not all sectors are reported). In 2012 the sectors with the highest revenue were Manufacturing and Retail Trade. All of the reported sectors combined generated more than \$3.99 billion in revenue for the county in 2012.

Table C-22 Revenue of Top Sectors in Yamhill County 2007 and 2012

Sector Meaning (NAICS code)	Firms		Sector Revenue (in Dollars)			Percent Change in Revenue (2007 to 2012)
	2007	2012	2007 [^]		2012	
			2007	(\$1,000)		
Accommodation and food services	186	195	98,905	109,488	129,254	15%
Health care and social assistance	241	260	342,675	379,341	433,648	13%
Manufacturing	205	225	1,885,753	2,087,529	1,893,589	-10%
Retail trade	282	283	951,130	1,052,901	886,639	-19%
Real estate and rental and leasing	117	102	42,677	47,243	36,426	-30%
Administrative and support and waste management and remediation services	100	103	75,522	83,603	63,306	-32%
Arts, entertainment, and recreation	24	24	-	-	15,383	-
Educational services	15	16	-	-	1,853	-
Finance and insurance	-	104	-	-	N	-
Information	29	31	-	-	N	-
Professional, scientific, and technical services	208	200	-	-	67,400	-
Transportation and warehousing(104)	-	62	-	-	468,447	-
Utilities	-	9	-	-	Q	-
Wholesale trade	84	70	396,840	439,302	Q	-
Other services (except public administration)	124	133	45,542	50,415	D	-
Total	1,615	1,817	3,839,044	4,249,822	3,995,945	-6%

Source: U.S. Census Bureau, 2007 and 2012 Economic Census, Table EC1200A1.

D = Withheld to avoid disclosing data for individual companies; data are included in higher level totals

N = Not available or not comparable

Q= Revenue not collected at this level of detail for multi-establishment firms

[^] 2007 dollars are adjusted for 2012.

Yamhill County relies on both basic and non-basic sector industries and it is important to consider the effects each may have on the economy following a disaster. Basic sector businesses have a multiplier effect on a local economy that can spur the creation of new jobs, some of which may be non-basic. The presence of basic sector jobs can help speed the local recovery; however, if basic sector production is hampered by a natural hazard event, the multiplier effect could be experienced in reverse. In this case, a decrease in basic sector

purchasing power results in lower profits and potential job losses for the non-basic businesses that are dependent on them.

If any of these primary sectors are impacted by a disaster, Yamhill County may experience a significant disruption of economic productivity. Transportation and warehousing brought Yamhill County considerable revenue in 2012, generating more than \$468 million. This sector is highly reliant upon basic infrastructure county-wide being up and running in order to succeed. Depending on type and scale, a disaster could affect all segments of the sector.

Synthesis

Regional economic capacity refers to the present financial resources and revenue generated in the community to achieve a higher quality of life. Forms of economic capital include income equality, housing affordability, economic diversifications, employment, and industry. The current and anticipated financial conditions of a community are strong determinants of community resilience, as a strong and diverse economic base increases the ability of individuals, families, and the county to absorb disaster impacts for a quick recovery.

The current and anticipated financial conditions of a community are strong determinants of community resilience, as a strong and diverse economic base increases the ability of individuals, families and the community to absorb disaster impacts for a quick recovery. Because Local Government, Education and Health Services, and Manufacturing are key to post-disaster recovery efforts, the region is bolstered by its diverse and strong employment sectors. The county's economy is expected to grow by 2027. It is important to consider what might happen to the county economy if the largest revenue generators and employers are impacted by a disaster. Strategies and actions to reduce vulnerability from an economic focus are imperative and should focus on risk management for the county's dominant industries.

Several industries- including Construction and Information- saw significant increases in employment from 2013 to 2018. While relying heavily on its top revenue-producing industries it is important for the county to consider the economic impacts that affect its residents in the event of a disaster. Strategies and actions to reduce vulnerability from an economic focus are imperative and should focus on risk management for the county's dominant industries.

Physical Infrastructure Capacity

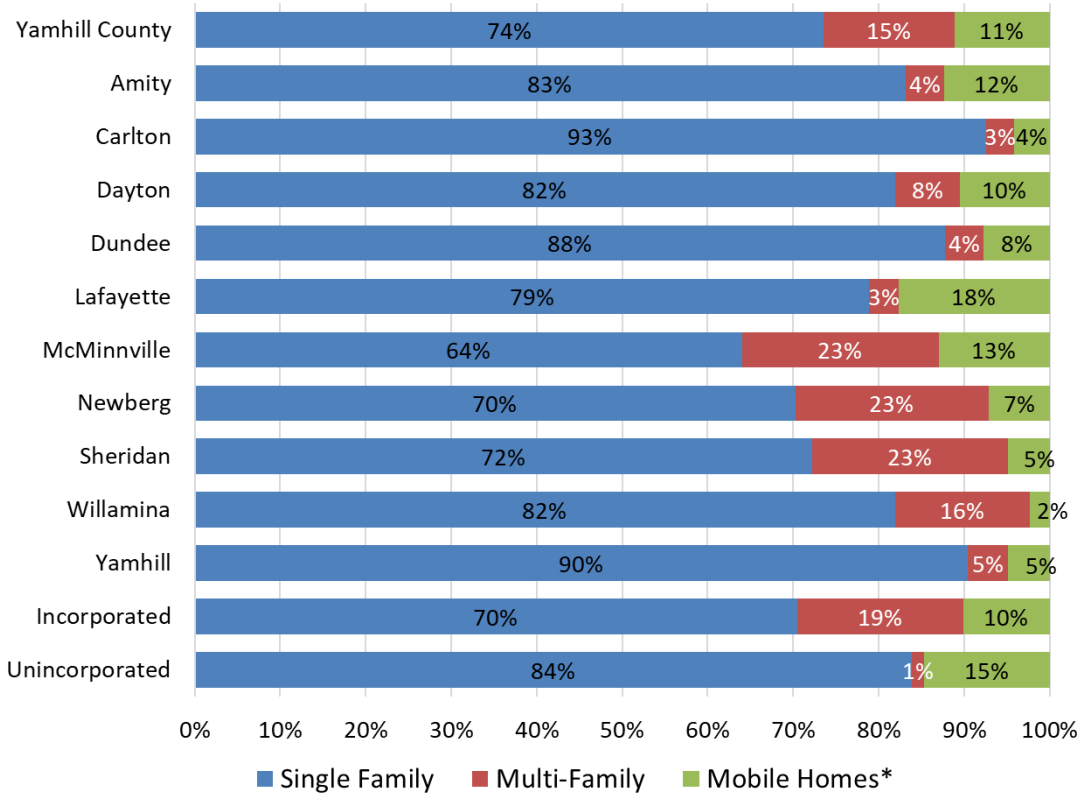
Physical infrastructure capacity refers to the built environment and infrastructure that supports the community. The various forms, quantity, and quality of built capital mentioned above contribute significantly to community resilience. Physical infrastructures, including utility and transportation lifelines, are critical during a disaster and are essential for proper functioning and response. The lack or poor condition of infrastructure can negatively affect a community's ability to cope, respond and recover from a natural disaster.

Housing

The table below identifies the types of housing most common throughout the county. Of particular interest are mobile homes, which account for about 11% of the housing countywide. The highest percent mobile homes are in Lafayette (18%) and the unincorporated areas of the county (15%). Mobile homes are particularly vulnerable to

certain natural hazards, such as windstorms, and special attention should be given to securing the structures, because they are more prone to wind damage than wood-frame construction. In other natural hazard events, such as earthquakes and floods, moveable structures like mobile homes are more likely to shift on their foundations and create hazardous conditions for occupants.

Figure C-7 Housing Profile



Social Explorer, U.S. Census Bureau, 2013-2017 American Community Survey Estimates. Table: SE:A10032.

Aside from location and type of housing, the year structures were built have important implications. In the 1970's, FEMA began assisting communities with floodplain mapping as a response to administer the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973. Upon receipt of floodplain maps, communities started to develop floodplain management ordinances to protect people and property from flood loss and damage. Housing within the floodplain is generally less vulnerable to flood if it was built after the implementation of floodplain development ordinances.

The National Flood Insurance Program's (NFIP's) Flood Insurance Rate Maps (FIRMs) delineate flood-prone areas. They are used to assess flood insurance premiums and to regulate construction so that in the event of a flood, damage minimized.

Seismic building standards were codified in Oregon building code starting in 1974; more rigorous building code standards were passed in 1993 that accounted for the Cascadia earthquake fault.²⁸ Therefore, homes built before 1993 are more vulnerable to seismic

²⁸ State of Oregon Building Codes Division. *Earthquake Design History: A summary of Requirements in the State of Oregon*, February 7, 2012.

events. DOGAMI’s interpretation of state building code histories and evolution as described by Judson (2012), Oregon Building Codes Division (2002, 2010) and Business Oregon (2015) is shown in Table C-23.

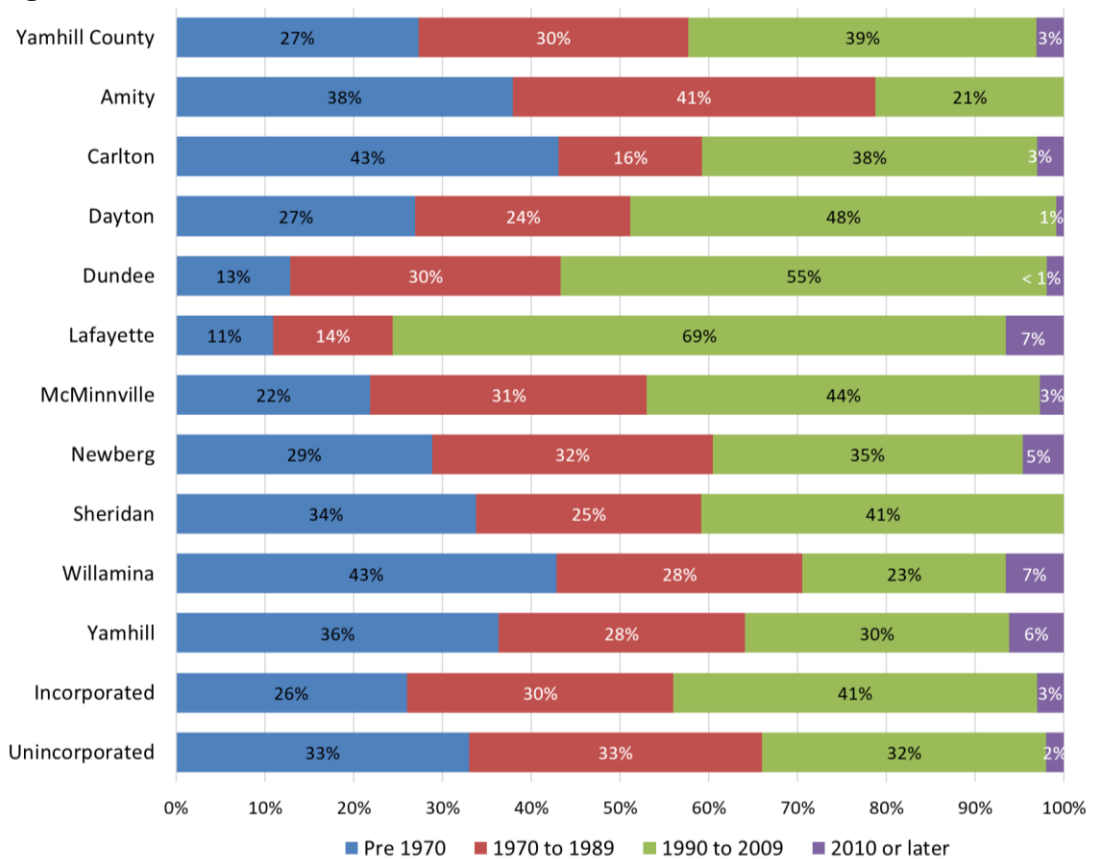
Table C-23 Oregon’s Seismic Design Level Benchmark Years

Building Type	Year Built	Design Level	Basis
Single Family Dwelling (including Duplexes)	prior to 1976	Pre Code	Interpretation of Judson (2012)
	1976-1991	Low Code	
	1992-2003	Moderate Code	
	2004-present	High Code	
Manufactured Housing	prior to 2003	Pre Code	Interpretation of Oregon Manufactured Dwelling Special Codes (Oregon Building Codes Division, 2002)
	2003-2010	Low Code	
	2011-present	Moderate Code	Interpretation of Oregon Manufactured Dwelling Special Codes Update (Oregon Building Codes Division, 2010)
All other buildings	prior to 1976	Pre Code	Interpretation of Oregon Benefit-Costs Analysis Tool (Business Oregon, 2015, p. 24)
	1976-190	Low Code	
	1991-present	Moderate Code	

Source: DOGAMI, Lower Columbia-Sandy Watershed Natural Hazard Risk Report (March 2018 Draft), Table 10.1.

Figure C-8 shows that, countywide, 27% of the housing stock was built prior to 1970 (33% in the unincorporated area), before the implementation of floodplain management ordinances. Almost 60% was built prior to 1990 and the implementation of more rigorous residential earthquake design standards (66% in the unincorporated area).

Figure C-8 Year Structure Built



Source: American Community Survey, U.S. Census Bureau, 2013-2017 American Community Survey Estimates. Table: ACS: B25034.

Infrastructure Profile

Physical infrastructure such as dams, roads, bridges, railways, and airports support Yamhill County communities and economies. Critical facilities are those facilities that are vital in government response and recovery activities and are important to consider as there can be serious secondary impacts to such facilities when disrupted. Critical facilities and infrastructure can be a wide range of things depending on the social, environmental, economic, and physical makeup of the area under consideration. Such facilities can include emergency services, communication services, transportation systems, government facilities, healthcare and public health facilities, information technology, water services, and energy generation and transmission. Due to the fundamental role that infrastructure plays both pre- and post-disaster, special attention in the context of creating more resilient communities is important. The information provided in this section will outline important infrastructures throughout the county which will help provide a basis for informed decisions about how to reduce the county's infrastructural vulnerabilities to natural hazards.

Dams

These critical infrastructure pieces not only protect water resources that are used for drinking, agriculture, and recreation, but they protect downstream development from inundation. Dams may also be multifunction, serving two or more of these purposes.

The National Inventory of Dams, NID, which is maintained by the United States Army Corps of Engineers, is a database of approximately 76,000 dams in the United States. The NID does not include all dams in the United States. Rather, the NID includes dams that are deemed to have a high or significant hazard potential and dams deemed to pose a low hazard if they meet inclusion criteria based on dam height and storage volume.

This NID potential hazard classification is solely a measure of the probable impacts if a dam fails. Thus, a dam classified as High Potential Hazard does not mean that the dam is unsafe or likely to fail. The level of risk (probability of failure) of a given dam is not even considered in this classification scheme. Rather, the High Potential Hazard classification simply means that there are people at risk downstream from the dam in the inundation area, if the dam were to fail.

Dams assigned to the significant hazard potential classification are those where failure or mis-operation results in no probable loss of human life but can cause economic loss, environmental damage, or disruption of lifeline facilities. Significant hazard potential dams are often located in predominantly rural or agricultural areas.

Dams assigned to the high hazard potential classification are those where failure or mis-operation will probably cause loss of human life. Failure of dams in the high classification will generally also result in economic, environmental or lifeline losses, but the classification is based solely on probable loss of life.

The Oregon Water and Resources Department maintains an inventory of all dams located in Oregon. There is a total of 66 dams located in Yamhill County (Table C-24). Two dams are categorized as high hazard in Yamhill County and only one that has storage of over 9,500: the McGuire Reservoir on the Nestucca River. Other key dams include Haskins Reservoir and Stormy Mountain Reservoir. There are also 11 dams categorized as significant hazard and 53 low hazard dams.

Table C-2 Yamhill County Dam Inventory

Threat Potential	Number of Dams	Dam Name (storage over 9,500 cu.ft.)
High	2	<i>McGuire Reservoir, Nestucca River (9,790)</i>
Significant	11	-
Low	53	-
Total	66	

Source: Oregon Water Resources Department, "Dam Inventory Query"

Dam failures can occur at any time in a dam’s life; however, failures are most common when water storage for the dam is at or near design capacity. At high water levels, the water force on the dam is higher and several of the most common failure modes are more likely to occur. Correspondingly, for any dam, the probability of failure is much lower when water levels are substantially below the design capacity for the reservoir.

Dam failures can occur rapidly and with little warning. Fortunately, most failures result in minor damage and pose little or no risk to life safety. However, the potential for severe damage still exists.

Railroads

Railroads are major providers of regional and national cargo and trade flows. Railroads run through the Northern Willamette region provide vital transportation links from the pacific to the rest of the country. The Portland & Western (PNWR) is a major railroad that runs through Yamhill County. It travels through the valley portion of the county moving northeast to and from the southwest. There is no passenger rail service in Yamhill County.

Rails are sensitive to icing from the winter storms that can occur in the Northern Willamette region. For industries in the region that utilize rail transport, these disruptions in service can result in economic losses. The potential for rail accidents caused by natural hazards can also have serious implications for the local communities if hazardous materials are involved.

Airports

Yamhill County has no commercial service airports, however Portland International Airport (PDX), the largest and busiest airport in the state, is in nearby Multnomah County. *Note: The Evergreen Aviation and Space Museum is located near McMinnville.*

Roads

The county’s major expressway is Hwy 99W. It runs North/South through Yamhill County and is one of the main passages for automobiles, buses, and trucks traveling through the state up to Yamhill County. Other highways that service Yamhill County include:

- OR- 240: connects Newberg to Yamhill.
- Tualatin Valley Hwy (47): Connects Hwy 99W to the northern county border, going through Yamhill City and Carlton.
- Hwy 18: connects McMinnville through Hwy 99W to the western part of the county, going through Willamina and Sheridan.

Natural hazards can further disrupt automobile traffic and create gridlock, and will make evacuations difficult.

Bridges

Because of earthquake risk, the seismic vulnerability of the county’s bridges is an important issue. Non-functional bridges can disrupt emergency operations, sever lifelines, and disrupt local and freight traffic. These disruptions may exacerbate local economic losses if industries are unable to transport goods. The county’s bridges are part of the state and interstate highway system that is maintained by the Oregon Department of Transportation (ODOT) or that are part of regional and local systems that are maintained by the region’s counties and cities.

Table C-25 shows the structural condition of bridges in the region. A distressed bridge is a condition rating used by the Oregon Department of Transportation (ODOT) indicating that a bridge has been identified as having a structural or other deficiency, while a deficient bridge is a federal performance measure used for non-ODOT bridges; the ratings do not imply that a bridge is unsafe.²⁹ The table shows that overall 37% of the county owned bridges are distressed compared to 39% of State Owned (ODOT) bridges. There are 2 historic bridges in the County.

Table C-25 Bridge Inventory

Bridge Owner	Number	Distressed	Percent Distressed	Historic
State	41	16	39%	37
County	89	33	37%	2
City	0	0	0%	N/A
Total	130	49	38%	39

Source: Oregon Department of Transportation, 2014; Oregon Department of Transportation (2013), Oregon’s Historic Bridge Field Guide

Utility Lifelines

Utility lifelines are the resources that the public relies on daily such as, electricity, fuel and communication lines. If these lines fail or are disrupted, the essential functions of the community can become severely impaired. Utility lifelines are closely related to physical infrastructures, like dams and power plants, as they transmit the power generated from these facilities.

Generally, the network of electricity transmission lines running throughout Yamhill County is operated by Portland General Electric.³⁰ McMinnville Water and Light operates service within McMinnville. With the Williams Gas Pipeline in the Northwest operating approximately 3,900 miles of pipe beginning in northern Washington, making its way down through Portland, Oregon and then ending in the Rogue Valley, most residents in Yamhill County have their natural gas operated by Northwest Natural Gas.³¹ These lines may be

²⁹ Oregon. Bridge Engineering Section (2012). 2012 Bridge Condition Report. Salem, Oregon: Bridge Section, Oregon Department. of Transportation.

³⁰ Allan, Stuart et. al., Atlas of Oregon. Pg. 102.

³¹ Williams, Gas Pipeline, Natural Gas Transportation & Storage

vulnerable as infrequent natural hazards, like earthquakes, could disrupt service to natural gas consumers across the region.

Seismic lifeline

Seismic lifeline routes help maintain transportation facilities for public safety and resilience in the case of natural disasters. Following a major earthquake, it is important for response and recovery agencies to know which roadways are most prepared for a major seismic event. The Oregon Department of Transportation has identified lifeline routes to provide a secure lifeline network of streets, highways, and bridges to facilitate emergency services response after a disaster.³²

System connectivity and key geographical features were used to identify a three-tiered seismic lifeline system. Routes identified as Tier 1 are considered the most significant and necessary to ensure a functioning statewide transportation network. The Tier 2 system provides additional connectivity to the Tier 1 system, it allows for direct access to more locations and increased traffic volume capacity. The Tier 3 lifeline routes provide additional connectivity to the systems provided by Tiers 1 and 2.

The Lifeline Routes in Yamhill County:

- Tier I: Hwy 18 southwest of McMinnville, 99W northeast of McMinnville.
- Tier II: 99W south of McMinnville.
- Tier III: Hwy 219.

Critical Facilities

Critical facilities are those facilities that are essential to government response and recovery activities (e.g., police and fire stations, public hospitals, public schools). It is important that these facilities are the most resilient to natural hazards as interruption or destruction of these facilities could restrict response efforts and time needed to assist those in danger.

Yamhill County is served by the Yamhill County Sheriff's office, as well as individual city law enforcement teams. The county Sheriff's office provides services to unincorporated parts of the county as well as contracts police services to some incorporated cities of Amity, Dayton, Lafayette, Sheridan, and Willamina while the rest of the incorporated cities have their own law enforcement agency that provides services within the city limits.³³ There are nine (9) structural and wildland fire agencies in Yamhill County. For more information on their locations please see the list of Critical Facilities (Table C-26). Aside from just extinguishing fires, each fire district and department provide essential mitigation efforts in the communities they serve, including meaningful discussion opportunities, hazardous fuel condition identification, and wildfire response resource evaluation.³⁴

Almost all the county departments are in McMinnville, including the Yamhill County Sheriff's office. The county Sheriff does not have primary jurisdiction in uncontracted cities including

³² Oregon Department of Transportation. Oregon Seismic Lifeline Evaluation Vulnerability Synthese Identification, *Oregon Seismic Lifeline Routes*, May 15 2012. Page 6-4 figure 6-1. Accessed September 12, 2019.

³³ Yamhill County Website, Yamhill County Sheriff's Office. Accessed 13 September 2019.
<https://www.co.yamhill.or.us/content/contract-cities>.

³⁴ Yamhill County Wildfire Protection Plan, page 5. Accessed 11 September 2019.

Carlton, Dundee, McMinnville, Newberg, and Yamhill. The County’s Disaster Management Office is an enforcement division of the county sheriff’s office.³⁵

Table C-27 Yamhill County Critical and Essential Facilities

Facility Name	Address
Government	
Yamhill County Courthouse	535 NE Fifth Street, McMinnville
Yamhill County Dog Control	2070 Lafayette Avenue, McMinnville
Yamhill County Emergency Management	414 NE Evans Street, McMinnville
Yamhill County Fairgrounds	2070 Lafayette Ave., McMinnville
Yamhill County Jail	535 NE Fifth Street, McMinnville
Yamhill County Public Works	2060 Lafayette Ave, McMinnville
Yamhill County Sheriff’s Office	535 NE Fifth Street, McMinnville
Educational	
<i>See City addenda for schools located within incorporated city limits.</i>	
Ewing Young Elementary School	17600 NE North Valley Road, Newberg SD 29J
Medical Care Facilities	
McMinnville Immediate Health Care	321 N. Hwy 99W Suite B, McMinnville
Newberg Urgent Care	2880 Hayes Street, Newberg
Physician’s Medical Center	2435 NE Cumulus Ave, McMinnville
Providence Newberg Medical Center	1003 Providence Drive, Newberg
Virginia Garcia Memorial Health Center	115 N.E. May Lane, McMinnville
Willamette Valley Medical Center	2700 SE Stratus Avenue, McMinnville
Community Facilities	
Northwest Senior & Disability Services	300 SW Hill Road, McMinnville
	2250 NE McDaniel Lane, McMinnville
	101 West Foothills, Newberg
	917 South Bridge Street, Sheridan
Yamhill Community Action Partnership	1317 NE Dustin Court, McMinnville 719 E First St, Newberg

Synthesis

Built capacity refers to the built environment and infrastructure that support a community. The various forms of built capital mentioned above will play significant roles in the event of a disaster. Physical infrastructures, along with utility and transportation lifelines are critical during a disaster and are essential for proper functioning and response. Community resilience is directly affected by the quality and quantity of built capital and lack of, or poor condition of, infrastructure can negatively affect a community’s ability to cope, respond, and

³⁵ Yamhill County Website, Yamhill County Sheriff’s Office. Accessed 13 September 2019. <https://www.co.yamhill.or.us/sheriff>

recover from a natural disaster. Initially following a disaster, communities may experience isolation from surrounding cities and counties due to infrastructure failure. These conditions will force communities to rely on local and immediate resources, so it is important to identify critical infrastructures throughout the county as they may play crucial roles in the mitigation and recovery stages of a disaster.

- 74% of the housing stock in Yamhill County is composed of single-family units, the other 26% is comprised of Mobile Homes and Multi-Family buildings, which are particularly prone to the effects of natural hazards and disasters.
- 27% of the total housing units throughout the county were built before building codes enforced a stricter policy for seismic building standards (pre-code or low code).
- 30% of the housing stock is renter-occupied.

It is important for the county to consider these numbers when producing mitigation and educational outreach materials as it is important to reach all populations, especially the ones who face a higher risk of damage. There are two (2) dams in the county classified with a high threat potential. There are a variety of critical facilities located throughout county limits that in the event of a disaster can make communication efforts challenging. Major seismic lifeline highways run throughout the county, giving residents a number of alternative routes that may provide service access, or serve as evacuation routes, yet if these roads are destroyed it can isolate communities and make rescue efforts more challenging.

Community Connectivity Capacity

Community connectivity capacity places strong emphasis on social structure, trust, norms, and cultural resources within a community. In terms of community resilience, these emerging elements of social and cultural capital will be drawn upon to stabilize the recovery of the community. Social and cultural capitals are present in all communities; however, it may be dramatically different from one city to the next as these capitals reflect the specific needs and composition of the community residents.

Social Systems and Service Providers

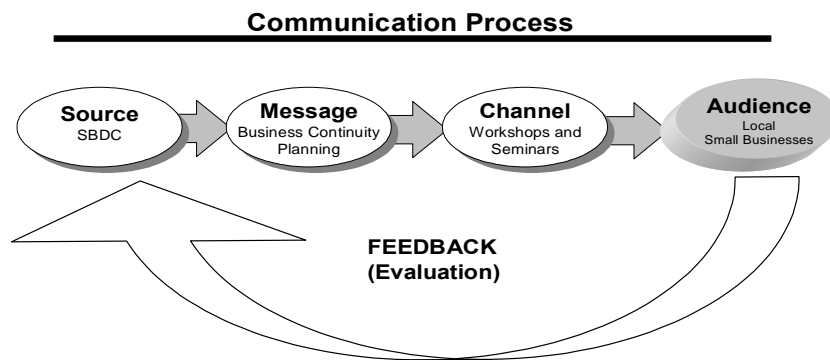
Social systems include community organizations and programs that provide social and community-based services, such as employment, health, senior and disabled services, professional associations and veterans' affairs for the public. In planning for natural hazard mitigation, it is important to know what social systems exist within the community because of their existing connections to the public. Often, actions identified by the plan involve communicating with the public or specific subgroups within the population (e.g. elderly, children, low income, etc.). The county can use existing social systems as resources for implementing such communication-related activities because these service providers already work directly with the public on several issues, one of which could be natural hazard preparedness and mitigation. The presence of these services is more predominantly located in urbanized areas of the county, this is synonymous with the general urbanizing trend of residents.

The following is a brief explanation of how the communication process works and how the community’s existing social service providers could be used to provide natural hazard related messages to their clients.

There are five essential elements for communicating effectively to a target audience:

- The source of the message must be credible,
- The message must be appropriately designed,
- The channel for communicating the message must be carefully selected,
- The audience must be clearly defined, and
- The recommended action must be clearly stated and a feedback channel established for questions, comments and suggestions.

Figure C-9 Communication Process



Source: Adapted from the U.S. Environmental Protection Agency Radon Division’s outreach program
 The following table provides a list of existing social systems within Yamhill County. The table provides information on each organization or program’s service area, types of services offered, populations served, and how the organization or program could be involved in natural hazard mitigation. The three involvement methods identified in the table are defined below:

- Education and outreach – organization could partner with the community to educate the public or provide outreach assistance on natural hazard preparedness and mitigation.
- Information dissemination – organization could partner with the community to provide hazard related information to target audiences.
- Plan/project implementation – organization may have plans and/or policies that may be used to implement mitigation activities or the organization could serve as the coordinating or partner organization to implement mitigation actions.

The information provided in the table can also be used to complete action item worksheets by identifying potential coordinating agencies and internal and external partners.

Community Stability

Community stability is a measure of rootedness in place. It is hypothesized that resilience to a disaster stems in part from familiarity with place, not only for navigating the community

during a crisis, but also accessing services and other supports for economic or social challenges.³⁶

Residential Geographic Stability

The table below estimates residential stability across the region. It is calculated by the number of people who have lived in the same house and those who have moved within the same county a year ago, compared to the percentage of people who have migrated into the region. Yamhill County overall has a geographic stability rating of about 92% (i.e., 92% of the population lived in the same house or moved within the county). Amity and Yamhill have the highest geographic stability (97%) while Sheridan has the lowest (84%).

Table C-26 Regional Residential Stability

Jurisdiction	Population	Geographic Stability	Same House	Moved Within Same County
Yamhill County	101,253	92%	85%	7%
Incorporated	78,109	90%	83%	8%
Amity	1,660	97%	90%	8%
Carlton	1,911	96%	90%	6%
Dayton	2,577	95%	91%	4%
Dundee	3,157	96%	89%	7%
Lafayette	3,935	95%	94%	2%
McMinnville	32,686	91%	81%	10%
Newberg	22,648	88%	81%	7%
Sheridan	6,041	84%	79%	5%
Willamina	2,132	87%	78%	9%
Yamhill	1,362	97%	84%	13%
Unincorporated	23,144	95%	91%	5%

Source: Social Explorer, U.S. Census Bureau, 2013-2017 American Community Survey Estimates. Table: SE: A08001.

Homeownership

Housing tenure describes whether residents rent or own the housing units they occupy. Homeowners are typically more financially stable but are at risk of greater property loss in a post-disaster situation. People may rent because they choose not to own, they do not have the financial resources for home ownership, or they are transient.

Collectively, about 64% of the occupied housing units in Yamhill County are owner-occupied; about 30% are renter occupied. Dundee (83%) has the highest rate of owner-occupied units. McMinnville (38%) has the highest rate of renter-occupied households. Willamina (11%) has the highest vacancy rates within the county.

³⁶ Cutter, Susan, Christopher Burton, Christopher Emrich. "Disaster Resilience Indicators for Benchmarking Baseline Conditions". Journal of Homeland Security and Emergency Management.

Table C-27 Housing Tenure and Vacancy

Jurisdiction	Housing Units	Owner-occupied		Renter-occupied		Seasonal [^]		Vacant ^{^^}	
		Estimate	Percent	Estimate	Percent	Estimate	Percent	Estimate	Percent
Yamhill County	38,286	24,428	64%	11,524	30%	290	1%	2,044	5%
Incorporated	29,316	17,485	60%	10,104	34%	96	<1%	1,631	6%
Amity	654	363	56%	229	35%	10	2%	52	8%
Carlton	696	489	70%	147	21%	9	1%	51	7%
Dayton	801	541	68%	207	26%	0	0%	53	7%
Dundee	1,080	899	83%	169	16%	0	0%	12	1%
Lafayette	1,318	1,059	80%	180	14%	0	0%	79	6%
McMinnville	13,089	7,362	56%	5,014	38%	77	1%	636	5%
Newberg	8,580	5,023	59%	3,103	36%	0	0%	454	5%
Sheridan	1,730	926	54%	643	37%	0	0%	161	9%
Willamina	900	488	54%	309	34%	0	0%	103	11%
Yamhill	468	335	72%	103	22%	0	0%	30	6%
Incorporated	8,970	6,943	77%	1,420	16%	194	2%	413	5%

Source: Social Explorer, U.S. Census Bureau, 2013-2017 American Community Survey Estimates. Table: SE: A10060. American Census Survey, U.S. Census Bureau, 2013-2017 American Community Survey Estimates. Table: ACS: B25004.

[^] = Seasonal, recreational, or occasional housing units.

^{^^} = Functional vacant units, computed after removing seasonal, recreational, or occasional housing units from vacant housing units.

According to Cutter, wealth increases resiliency and recovery from disasters. Renters often do not have personal financial resources or insurance to assist them post-disaster. On the other hand, renters tend to be more mobile and have fewer assets at risk of natural hazards.³⁷ In the most extreme cases, renters lack sufficient shelter options when lodging becomes uninhabitable or unaffordable post-disaster.

Synthesis

Yamhill County has distinct social and cultural resources that work in favor to increase community connectivity and resilience. Sustaining social and cultural resources, such as social services and cultural events, may be essential to preserving community cohesion and a sense of place. The presence of a larger community like McMinnville makes additional resources and services available for the public. However, it is important to consider that these amenities may not be equally distributed to the rural portions of the county and may produce implications for recovery in the event of a disaster.

In the long-term, it may be of interest to the county to evaluate community stability. A community experiencing instability and low homeownership may hinder the effectiveness of social and cultural resources, distressing community coping and response mechanisms.

³⁷ Cutter, S. L. (2003). Social Vulnerability to Environmental Hazards. *Social Science Quarterly*.

Political Capacity

Political capacity is recognized as the government and planning structures established within the community. In terms of hazard resilience, it is essential for political capital to encompass diverse government and non-government entities in collaboration; as disaster losses stem from a predictable result of interactions between the physical environment, social and demographic characteristics and the built environment.³⁸ Resilient political capital seeks to involve various stakeholders in hazard planning and works towards integrating the Natural Hazard Mitigation Plan with other community plans, so that all planning approaches are consistent.

Government Structure

Yamhill County is governed by a three-member Board of Commissioners. The Commissioners are elected to four-year terms and serve as the governing body which directs the general administration of county government. The county encompasses all or part of 10 cities. The Commissioners set policies, enact ordinances, and establish and manage budgets to perform the services that state law and citizens of the county requires.

Beyond the valuable function of emergency (disaster) management, all departments within the county governance structure have some degree of responsibility in building overall community resilience. Each department plays a critical role in ensuring that county functions and normal operations resume after an incident, and that the needs of the population are met.

Some divisions and departments of Yamhill County government that have a role in hazard mitigation are:

- **Yamhill County Emergency Management:** Provides a program that educates County residents in the mitigation of, preparedness for, response to and recovery from all hazards either natural or manmade. The Emergency Management coordinated with county jurisdictions and oversaw the creation of this NHMP.
- **Planning and Development:** Covers a wide range of necessary services for regular county operations as well as mitigation, including programs overseeing the development and maintenance of buildings, the electric wiring and installation, water and sewage disposal and sanitation, soil classification, foresting practices, etc.
- **Yamhill County Health and Human Services:** In addition to providing health and wellness services like immunizations, STI testing and treatment, and restaurant licensing, the health and human services department has an Emergency Preparedness section on their website (login required).³⁹
- **Technology Services:** Engages in providing technology services to the various departments and divisions of Yamhill County. This department also provides voice communications services to the County as well as the City of McMinnville.
- **Geographic Information Systems:** Yamhill County Provides several interactive digital maps to explore the county.

³⁸ Mileti, D. 1999. *Disaster by Design: a Reassessment of Natural Hazards in the United States*. D.C.: Joseph Henry Press.

³⁹ Yamhill County Website, Yamhill County Health and Human Services. Accessed 11 September 2019. <https://hhs.co.yamhill.or.us/>

- **Sheriff's Office:** The mission of the Yamhill County Sheriff's Office is to provide citizens with high quality law enforcement services in an ethically and fiscally responsible manner.⁴⁰ As the central law enforcement office with a countywide jurisdiction, the Sheriff's office will likely act as a central county coordinator in the case of a natural disaster.

Regulatory Context: Oregon Statewide Planning Goal 7

Since 1973, Oregon has maintained a strong statewide program for land use planning. The foundation of that program is a set of 19 statewide planning goals that express the state's policies on land use and on related topics, such as citizen involvement, land use planning, and natural resources.

Most of the goals are accompanied by "guidelines," which are suggestions about how a goal may be applied. Oregon's statewide goals are achieved through local comprehensive planning. State law requires each city and county to adopt a comprehensive plan and the zoning and land-division ordinances needed to put the plan into effect. The local comprehensive plans must be consistent with the statewide planning goals. Plans are reviewed for such consistency by the state's Land Conservation and Development Commission (LCDC). When LCDC officially approves a local government's plan, the plan is said to be "acknowledged." It then becomes the controlling document for land use in the area covered by that plan.

Statewide Planning Goal 7

Goal 7: Areas Subject to Natural Disasters and Hazards has the overriding purpose to "protect people and property from natural hazards." Goal 7 requires local governments to adopt comprehensive plans (inventories, policies and implementing measures) to reduce risk to people and property from natural hazards. Natural hazards include floods, landslides, earthquakes, tsunamis, coastal erosion, and wildfires.

To comply with Goal 7, local governments are required to respond to new hazard inventory information from federal or state agencies. The local government must evaluate the hazard risk and assess the:

- frequency, severity, and location of the hazard;
- effects of the hazard on existing and future development;
- potential for development in the hazard area to increase the frequency and severity of the hazard; and
- types and intensities of land uses to be allowed in the hazard area.

Local governments must adopt or amend comprehensive plan policies and implementing measures to avoid development in hazard areas where the risk cannot be mitigated. In addition, the siting of essential facilities, major structures, hazardous facilities and special occupancy structures should be prohibited in hazard areas where the risk to public safety cannot be mitigated. The state recognizes compliance with

⁴⁰ Yamhill County Website, Yamhill County Sheriff's Office. Accessed 13 September 2019.
<https://www.co.yamhill.or.us/sheriff>

Goal 7 for coastal and riverine flood hazards by adopting and implementing local floodplain regulations that meet the minimum National Flood Insurance Program (NFIP) requirements.

Goal 7 Planning Guidelines

- In adopting plan policies and implementing measures for protection from natural hazards, local governments should consider:
 - the benefits of maintaining natural hazard areas as open space, recreation, and other low density uses;
 - the beneficial effects that natural hazards can have on natural resources and the environment; and
 - the effects of development and mitigation measures in identified hazard areas on the management of natural resources.
- Local governments should coordinate their land use plans and decisions with emergency preparedness, response, recovery and mitigation programs.

Goal 7 Implementation Guidelines

Goal 7 guides local governments to give special attention to emergency access when considering development in identified hazard areas.

- Consider programs to manage stormwater runoff to address flood and landslide hazards.
- Consider non-regulatory approaches to help implement the goal.
- When reviewing development requests in high-hazard areas, require site-specific reports, appropriate for the level and type of hazard. Reports should evaluate the risk to the site, as well as the risk the proposed development may pose to other properties.
- Consider measures exceeding the National Flood Insurance Program.

Existing Plans and Policies

Communities often have existing plans and policies that guide and influence land use, land development, and population growth. Such existing plans and policies can include comprehensive plans, zoning ordinances, and technical reports or studies. Plans and policies already in existence have support from local residents, businesses and policy makers. Many land-use, comprehensive, and strategic plans get updated regularly, and can adapt easily to changing conditions and needs.⁴¹

The Yamhill County NHMP includes a range of recommended action items that, when implemented, will reduce the county's vulnerability to natural hazards. Many of these recommendations are consistent with the goals and objectives of the county's existing plans and policies. Linking existing plans and policies to the NHMP helps identify what resources already exist that can be used to implement the action items identified in the plan. Implementing the natural hazards mitigation plan's action items through existing plans and policies increases their likelihood of being supported and getting updated and maximizes the county's resources.

⁴¹ Burby, Raymond J., ed. 1998. Cooperating with Nature: Confronting Natural Hazards with Land-Use Planning for Sustainable Communities.

In addition to the plans listed below the county and incorporated cities also have zoning ordinances (including floodplain development regulations) and building regulations.

Existing plans that can incorporate mitigation actions include (for more information on these plans and a list of planning ordinances please see the county [website](#)):

The following is a list of plans and policies already in place in Yamhill County:

- **Yamhill County Natural Hazards Mitigation Plan:** The Yamhill County Natural Hazards Mitigation Plan includes resources and information to assist county residents, public and private sector organizations and others interested in participating in natural hazard mitigation activities.
- **Oregon's Statewide Natural Hazard Mitigation Plan:** This plan, prepared by the State Interagency Hazard Mitigation Team, was consulted to establish consistency with the State hazard mitigation plan.
- **Yamhill County Community Wildfire Protection Plan:** Identifies and prioritizes wildfire hazards in Yamhill County and develops a strategy to reduce those hazards.
- **Yamhill County Emergency Operations Plan:** Identifies emergency planning, policies, procedures, and response to extraordinary emergency situations associated with natural disasters, technological incidents, and national security emergencies.
- **Yamhill County Comprehensive Plan:** The land use element provided information on existing land use and future development trends. The safety element provided information for the hazard profiles and development of the mitigation strategy for landslides, fire, and flood hazards. The seismic safety element provided information for the hazard profile section and the mitigation strategy for earthquakes and tsunamis.
- **Yamhill County Zoning Ordinance:** These codes regulate development and land use; they were used to develop the capability assessment and the mitigation strategy.
- **Lower Yamhill Watershed Assessment:** The overriding purpose of the assessment is to evaluate the natural and human processes influencing the watershed's ability to produce clean water and suitable habitat for aquatic life
- **Yamhill County Economic Development Plan:** This document sets out a five-year strategic plan for Yamhill County's economic development efforts.
- **Yamhill County Community Health Improvement Plan:** This plan describes the status of health needs and unmet needs in Yamhill County with discussion surrounding on local public health services, basic services, and additional services. Hazards are discussed in the section on additional services in the context of public health preparedness.
- **Ten Year Ending Homelessness Plan:** This document, developed in 2009, presents strategies to prevent eventually eliminate chronic homelessness in Yamhill County and its jurisdictions. Strategies include provision of permanent housing and coordinated services.
- **Yamhill Watershed Culvert Prioritization and Action Plan for Fish Passage:** This plan, developed in 2012 by the Bureau of Land Management, surveys 178 culverts to prioritize culvert upgrades for fish passage. In places where the fish passage needs coincide with needs for flood control actions can be clustered between partners to leverage more funding opportunities for projects.

Synthesis

Recognized as the government and planning structures established within the community, political capital is an essential component of hazard resilience. Allowing the county itself to collaborate with several different county departments as well as outside entities makes the NHMP more diverse. Because the NHMP is composed with input from government and non-government parties, it seeks to ensure that all parties that might be involved in a disaster have a way to become more resilient. It is important that the NHMP reaches out to as many entities as possible as disasters have no boundaries and can affect everyone and anyone. Being aware of hazard mitigation ahead of time will allow all parties to prepare and become more resilient.

Yamhill County works with several departments to include them during the hazard mitigation planning process which allows the plan to be diverse and include input from a variety of entities. Likewise, other planning documents and policies throughout the county refer to the NHMP as there is some overlap and balance in how the county deals with mitigation-related issues.

Appendix D: Economic Analysis of Natural Hazard Mitigation Projects

This appendix was developed by the Oregon Partnership for Disaster Resilience at the University of Oregon's Institute for Policy Research and Engagement (IPRE). It has been reviewed and accepted by the Federal Emergency Management Agency as a means of documenting how the prioritization of actions shall include a special emphasis on the extent to which benefits are maximized according to a cost benefit review of the proposed projects and their associated costs.

The appendix outlines three approaches for conducting economic analyses of natural hazard mitigation projects. It describes the importance of implementing mitigation activities, different approaches to economic analysis of mitigation strategies, and methods to calculate costs and benefits associated with mitigation strategies. Information in this section is derived in part from: The Interagency Hazards Mitigation Team, *State Hazard Mitigation Plan*, (Oregon Military Department – Office of Emergency Management, 2000), and Federal Emergency Management Agency Publication 331, *Report on Costs and Benefits of Natural Hazard Mitigation*. This section is not intended to provide a comprehensive description of benefit/cost analysis, nor is it intended to evaluate local projects. It is intended to (1) raise benefit/cost analysis as an important issue, and (2) provide some background on how an economic analysis can be used to evaluate mitigation projects.

Why Evaluate Mitigation Strategies?

Mitigation activities reduce the cost of disasters by minimizing property damage, injuries, and the potential for loss of life, and by reducing emergency response costs, which would otherwise be incurred. Evaluating possible natural hazard mitigation activities provides decision-makers with an understanding of the potential benefits and costs of an activity, as well as a basis upon which to compare alternative projects.

Evaluating mitigation projects is a complex and difficult undertaking, which is influenced by many variables. First, natural disasters affect all segments of the communities they strike, including individuals, businesses, and public services such as fire, law enforcement, utilities, and schools. Second, while some of the direct and indirect costs of disaster damages are measurable, some of the costs are non-financial and difficult to quantify in dollars. Third, many of the impacts of such events produce “ripple-effects” throughout the community, greatly increasing the disaster's social and economic consequences.

While not easily accomplished, there is value from a public policy perspective, in assessing the positive and negative impacts from mitigation activities and obtaining an instructive benefit/cost comparison. Otherwise, the decision to pursue or not pursue various mitigation options would not be based on an objective understanding of the net benefit or loss associated with these actions.

Mitigation Strategy Economic Analyses Approaches

The approaches used to identify the costs and benefits associated with natural hazard mitigation strategies, measures, or projects fall into three general categories: benefit/cost analysis, cost-effectiveness analysis and the STAPLE/E approach. The distinction between the three methods is outlined below:

Benefit/Cost Analysis

Benefit/cost analysis is a key mechanism used by the state Oregon Office of Emergency Management (OEM), the Federal Emergency Management Agency (FEMA), and other state and federal agencies in evaluating hazard mitigation projects and is required by the Robert T. Stafford Disaster Relief and Emergency Assistance Act, Public Law 93-288, as amended.

Benefit/cost analysis is used in natural hazards mitigation to show if the benefits to life and property protected through mitigation efforts exceed the cost of the mitigation activity. Conducting benefit/cost analysis for a mitigation activity can assist communities in determining whether a project is worth undertaking now, to avoid disaster-related damages later. Benefit/cost analysis is based on calculating the frequency and severity of a hazard, avoiding future damages, and risk. In benefit/cost analysis, all costs and benefits are evaluated in terms of dollars, and a net benefit/cost ratio is computed to determine whether a project should be implemented. A project must have a benefit/cost ratio greater than 1 (i.e., the net benefits will exceed the net costs) to be eligible for FEMA funding. Unless an alternate approach is approved by FEMA, jurisdictions must use the latest available approved FEMA benefit/cost analysis (BCA) toolkit. Alternate approaches should be used with consultation from the State Hazard Mitigation Officer. See <https://www.fema.gov/benefit-cost-analysis> for more information.

Cost-Effectiveness Analysis

Cost-effectiveness analysis evaluates how best to spend a given amount of money to achieve a specific goal. This type of analysis, however, does not necessarily measure costs and benefits in terms of dollars. Determining the economic feasibility of mitigating natural hazards can also be organized according to the perspective of those with an economic interest in the outcome. Hence, economic analysis approaches are covered for both public and private sectors as follows.

Investing in Public Sector Mitigation Activities

Evaluating mitigation strategies in the public sector is complicated because it involves estimating all of the economic benefits and costs regardless of who realizes them, and potentially to a large number of people and economic entities. Some benefits cannot be evaluated monetarily, but still affect the public in profound ways. Economists have developed methods to evaluate the economic feasibility of public decisions which involve a diverse set of beneficiaries and non-market benefits.

Investing in Private Sector Mitigation Activities

Private sector mitigation projects may occur based on one or two approaches: it may be mandated by a regulation or standard, or it may be economically justified on its own merits. A building or

landowner, whether a private entity or a public agency, required to conform to a mandated standard may consider the following options:

1. Request cost sharing from public agencies;
2. Dispose of the building or land either by sale or demolition;
3. Change the designated use of the building or land and change the hazard mitigation compliance requirement; or
4. Evaluate the most feasible alternatives and initiate the most cost-effective hazard mitigation alternative.

The sale of a building or land triggers another set of concerns. For example, real estate disclosure laws can be developed which require sellers of real property to disclose known defects and deficiencies in the property, including earthquake weaknesses and hazards to prospective purchases. Correcting deficiencies can be expensive and time consuming, but their existence can prevent the sale of the building. Conditions of a sale regarding the deficiencies and the price of the building can be negotiated between a buyer and seller.

STAPLE/E Approach

Considering detailed benefit/cost or cost-effectiveness analysis for every possible mitigation activity could be very time consuming and may not be practical. There are some alternate approaches for conducting a quick evaluation of the proposed mitigation activities which could be used to identify those mitigation activities that merit more detailed assessment. One of those methods is the STAPLE/E approach.

Using STAPLE/E criteria, mitigation activities can be evaluated quickly by steering committees in a synthetic fashion. This set of criteria requires the Steering Committee to assess the mitigation activities based on the Social, Technical, Administrative, Political, Legal, Economic and Environmental (STAPLE/E) constraints and opportunities of implementing the particular mitigation item in your community. The second chapter in FEMA's How-To Guide "Developing the Mitigation Plan – Identifying Mitigation Actions and Implementation Strategies" as well as the "State of Oregon's Local Natural Hazard Mitigation Plan: An Evaluation Process" outline some specific considerations in analyzing each aspect. The following are suggestions for how to examine each aspect of the STAPLE/E approach from the "State of Oregon's Local Natural Hazard Mitigation Plan: An Evaluation Process."

Social: Community development staff, local non-profit organizations, or a local planning board can help answer these questions.

- Is the proposed action socially acceptable to the community?
- Are there equity issues involved that would mean that one segment of the community is treated unfairly?
- Will the action cause social disruption?

Technical: The city or county public works staff and building department staff can help answer these questions.

- Will the proposed action work?

- Will it create more problems than it solves?
- Does it solve a problem or only a symptom?
- Is it the most useful action considering other community goals?

Administrative: Elected officials or the city or county administrator, can help answer these questions.

- Can the community implement the action?
- Is there someone to coordinate and lead the effort?
- Is there sufficient funding, staff, and technical support available?
- Are there ongoing administrative requirements that need to be met?

Political: Consult the mayor, city council or city board of commissioners, city or county administrator, and local planning commissions to help answer these questions.

- Is the action politically acceptable?
- Is there public support both to implement and to maintain the project?

Legal: Include legal counsel, land use planners, risk managers, and city council or county planning commission members, among others, in this discussion.

- Is the community authorized to implement the proposed action? Is there a clear legal basis or precedent for this activity?
- Are there legal side effects? Could the activity be construed as a taking?
- Is the proposed action allowed by the comprehensive plan, or must the comprehensive plan be amended to allow the proposed action?
- Will the community be liable for action or lack of action?
- Will the activity be challenged?

Economic: Community economic development staff, civil engineers, building department staff, and the assessor's office can help answer these questions.

- What are the costs and benefits of this action?
- Do the benefits exceed the costs?
- Are initial, maintenance, and administrative costs taken into account?
- Has funding been secured for the proposed action? If not, what are the potential funding sources (public, non-profit, and private?)
- How will this action affect the fiscal capability of the community?
- What burden will this action place on the tax base or local economy?
- What are the budget and revenue effects of this activity?

- Does the action contribute to other community goals, such as capital improvements or economic development?
- What benefits will the action provide? (This can include dollar amount of damages prevented, number of homes protected, credit under the CRS, potential for funding under the HMGP or the FMA program, etc.)

Environmental: Watershed councils, environmental groups, land use planners and natural resource managers can help answer these questions.

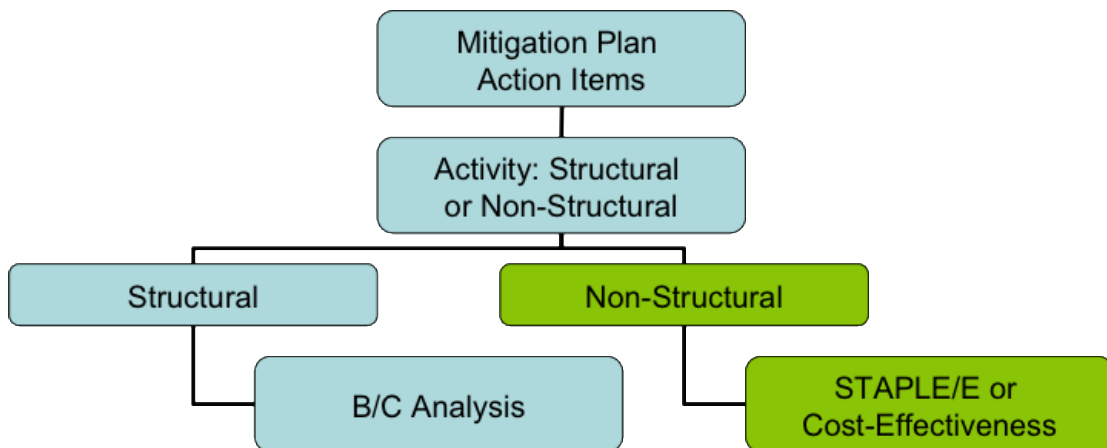
- How will the action impact the environment?
- Will the action need environmental regulatory approvals?
- Will it meet local and state regulatory requirements?
- Are endangered or threatened species likely to be affected?

The STAPLE/E approach is helpful for doing a quick analysis of mitigation projects. Most projects that seek federal funding and others often require more detailed benefit/cost analyses.

When to use the Various Approaches

It is important to realize that various funding sources require different types of economic analyses. The following figure is to serve as a guideline for when to use the various approaches.

Figure D-I Economic Analysis Flowchart



Source: Oregon Partnership for Disaster Resilience. 2005.

Implementing the Approaches

Benefit/cost analysis, cost-effectiveness analysis, and the STAPLE/E are important tools in evaluating whether to implement a mitigation activity. A framework for evaluating

mitigation activities is outlined below. This framework should be used in further analyzing the feasibility of prioritized mitigation activities.

1. Identify the Activities

Activities for reducing risk from natural hazards can include structural projects to enhance disaster resistance, education and outreach, and acquisition or demolition of exposed properties, among others. Different mitigation projects can assist in minimizing risk to natural hazards but do so at varying economic costs.

2. Calculate the Costs and Benefits

Choosing economic criteria is essential to systematically calculating costs and benefits of mitigation projects and selecting the most appropriate activities. Potential economic criteria to evaluate alternatives include:

- **Determine the project cost.** This may include initial project development costs, and repair and operating costs of maintaining projects over time.
- **Estimate the benefits.** Projecting the benefits, or cash flow resulting from a project can be difficult. Expected future returns from the mitigation effort depend on the correct specification of the risk and the effectiveness of the project, which may not be well known. Expected future costs depend on the physical durability and potential economic obsolescence of the investment. This is difficult to project. These considerations will also provide guidance in selecting an appropriate salvage value. Future tax structures and rates must be projected. Financing alternatives must be researched, and they may include retained earnings, bond and stock issues, and commercial loans.
- **Consider costs and benefits to society and the environment.** These are not easily measured but can be assessed through a variety of economic tools including existence value or contingent value theories. These theories provide quantitative data on the value people attribute to physical or social environments. Even without hard data, however, impacts of structural projects to the physical environment or to society should be considered when implementing mitigation projects.
- **Determine the correct discount rate.** Determination of the discount rate can just be the risk-free cost of capital, but it may include the decision maker's time preference and also a risk premium. Including inflation should also be considered.

3. Analyze and Rank the Activities

Once costs and benefits have been quantified, economic analysis tools can rank the possible mitigation activities. Two methods for determining the best activities given varying costs and benefits include net present value and internal rate of return.

- **Net present value.** Net present value is the value of the expected future returns of an investment minus the value of the expected future cost expressed in today's dollars. If the net present value is greater than the projected costs, the project may be determined feasible for implementation. Selecting the discount rate and

identifying the present and future costs and benefits of the project calculates the net present value of projects.

- **Internal rate of return.** Using the internal rate of return method to evaluate mitigation projects provides the interest rate equivalent to the dollar returns expected from the project. Once the rate has been calculated, it can be compared to rates earned by investing in alternative projects. Projects may be feasible to implement when the internal rate of return is greater than the total costs of the project. Once the mitigation projects are ranked based on economic criteria, decision-makers can consider other factors, such as risk, project effectiveness, and economic, environmental, and social returns in choosing the appropriate project for implementation.

Economic Returns of Natural Hazard Mitigation

The estimation of economic returns, which accrue to building or land owners because of natural hazard mitigation, is difficult. Owners evaluating the economic feasibility of mitigation should consider reductions in physical damages and financial losses. A partial list follows:

- Building damages avoided
- Content damages avoided
- Inventory damages avoided
- Rental income losses avoided
- Relocation and disruption expenses avoided
- Proprietor's income losses avoided

These parameters can be estimated using observed prices, costs, and engineering data. The difficult part is to correctly determine the effectiveness of the hazard mitigation project and the resulting reduction in damages and losses. Equally as difficult is assessing the probability that an event will occur. The damages and losses should only include those that will be borne by the owner. The salvage value of the investment can be important in determining economic feasibility. Salvage value becomes more important as the time horizon of the owner declines. This is important because most businesses depreciate assets over time.

Additional Costs from Natural Hazards

Property owners should also assess changes in a broader set of factors that can change because of a large natural disaster. These are usually termed "indirect" effects, but they can have a very direct effect on the economic value of the owner's building or land. They can be positive or negative, and include changes in the following:

- Commodity and resource prices
- Availability of resource supplies
- Commodity and resource demand changes
- Building and land values
- Capital availability and interest rates
- Availability of labor
- Economic structure
- Infrastructure
- Regional exports and imports

- Local, state, and national regulations and policies
- Insurance availability and rates

Changes in the resources and industries listed above are more difficult to estimate and require models that are structured to estimate total economic impacts. Total economic impacts are the sum of direct and indirect economic impacts. Total economic impact models are usually not combined with economic feasibility models. Many models exist to estimate total economic impacts of changes in an economy. Decision makers should understand the total economic impacts of natural disasters to calculate the benefits of a mitigation activity. This suggests that understanding the local economy is an important first step in being able to understand the potential impacts of a disaster, and the benefits of mitigation activities.

Additional Considerations

Conducting an economic analysis for potential mitigation activities can assist decision-makers in choosing the most appropriate strategy for their community to reduce risk and prevent loss from natural hazards. Economic analysis can also save time and resources from being spent on inappropriate or unfeasible projects. Several resources and models are listed on the following page that can assist in conducting an economic analysis for natural hazard mitigation activities.

Benefit/cost analysis is complicated, and the numbers may divert attention from other important issues. It is important to consider the qualitative factors of a project associated with mitigation that cannot be evaluated economically. There are alternative approaches to implementing mitigation projects. With this in mind, opportunity rises to develop strategies that integrate natural hazard mitigation with projects related to watersheds, environmental planning, community economic development, small business development, critical infrastructure, and transportation projects among others. Incorporating natural hazard mitigation with other community projects can increase the viability of project implementation.

Resources

CUREe Kajima Project, *Methodologies for Evaluating the Socio-Economic Consequences of Large Earthquakes*, Task 7.2 Economic Impact Analysis, Prepared by University of California, Berkeley Team, Robert A. Olson, VSP Associates, Team Leader; John M. Eiding, G&E Engineering Systems; Kenneth A. Goettel, Goettel and Associates, Inc.; and Gerald L. Horner, Hazard Mitigation Economics Inc., 1997

Federal Emergency Management Agency, *Benefit/Cost Analysis of Hazard Mitigation Projects*, Riverine Flood, Version 1.05, Hazard Mitigation Economics, Inc., 1996

Federal Emergency Management Agency, [Report on the Costs and Benefits of Natural Hazard Mitigation](#). Publication 331, 1996.

Goettel & Horner Inc., *Earthquake Risk Analysis Volume III: The Economic Feasibility of Seismic Rehabilitation of Buildings in the City of Portland*, Submitted to the Bureau of Buildings, City of Portland, August 30, 1995.

Goettel & Horner Inc., *Benefit/Cost Analysis of Hazard Mitigation Projects Volume V, Earthquakes*, Prepared for FEMA's Hazard Mitigation Branch, October 25, 1995.

Horner, Gerald, *Benefit/Cost Methodologies for Use in Evaluating the Cost Effectiveness of Proposed Hazard Mitigation Measures*, Robert Olsen Associates, Prepared for Oregon Military Department – Office of Emergency Management, July 1999.

Interagency Hazards Mitigation Team, *State Hazard Mitigation Plan*, (Oregon State Police – Office of Emergency Management, 2000.)

Risk Management Solutions, Inc., *Development of a Standardized Earthquake Loss Estimation Methodology*, National Institute of Building Sciences, Volume I and II, 1994.

VSP Associates, Inc., *A Benefit/Cost Model for the Seismic Rehabilitation of Buildings*, Volumes 1 & 2, Federal Emergency management Agency, FEMA Publication Numbers 227 and 228, 1991.

VSP Associates, Inc., *Benefit/Cost Analysis of Hazard Mitigation Projects: Section 404 Hazard Mitigation Program and Section 406 Public Assistance Program, Volume 3: Seismic Hazard Mitigation Projects*, 1993.

VSP Associates, Inc., *Seismic Rehabilitation of Federal Buildings: A Benefit/Cost Model*, Volume 1, Federal Emergency Management Agency, FEMA Publication Number 255, 1994.

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APPENDIX E: GRANT PROGRAMS AND RESOURCES

Introduction

There are numerous local, state and federal funding sources available to support natural hazard mitigation projects and planning. The following section includes an abbreviated list of the most common funding sources utilized by local jurisdictions in Oregon. Because grant programs often change, it is important to periodically review available funding sources for current guidelines and program descriptions.

Post-Disaster Federal Programs

Hazard Mitigation Grant Program

The Hazard Mitigation Grant Program (HMGP) provides grants to states and local governments to implement long-term hazard mitigation measures after a major disaster declaration. The purpose of the HMGP is to reduce the loss of life and property due to natural disasters and to enable mitigation measures to be implemented during the immediate recovery from a disaster. The HMGP is authorized under Section 404 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act. The HMGP involves a paper application which is first offered to the counties with declared disasters within the past year, then becomes available statewide if funding is still available.

<http://www.fema.gov/hazard-mitigation-grant-program>

Physical Disaster Loan Program

When physical disaster loans are made to homeowners and businesses following disaster declarations by the U.S. Small Business Administration (SBA), up to 20% of the loan amount can go towards specific measures taken to protect against recurring damage in similar future disasters. <http://www.sba.gov/category/navigation-structure/loans-grants/small-business-loans/disaster-loans>

Pre-Disaster Federal Programs

Building Resilient Infrastructure and Communities Grant Program

The Building Resilient Infrastructure and Communities (BRIC) program provides funds to states, territories, Indian tribal governments, communities, and universities for hazard mitigation planning and the implementation of mitigation projects prior to a disaster event. Funding these plans and projects reduces overall risks to the population and structures, while also reducing reliance on funding from actual disaster declarations. BRIC grants are to be awarded on a competitive basis and without reference to state allocations, quotas, or other formula-based allocation of funds. The BRIC grant program is offered annually; applications are submitted online. Applicants need a user profile approved by the State Hazard Mitigation Officer, which should be garnered well before the application period opens. <https://www.fema.gov/grants/mitigation/building-resilient-infrastructure-communities>

Flood Mitigation Assistance Program

The overall goal of the Flood Mitigation Assistance (FMA) Program is to fund cost-effective measures that reduce or eliminate the long-term risk of flood damage to buildings, manufactured homes, and other National Flood Insurance Program (NFIP) insurable structures. This specifically includes:

- Reducing the number of repetitively or substantially damaged structures and the associated flood insurance claims;
- Encouraging long-term, comprehensive hazard mitigation planning;
- Responding to the needs of communities participating in the NFIP to expand their mitigation activities beyond floodplain development activities; and
- Complementing other federal and state mitigation programs with similar, long-term mitigation goals.

<http://www.fema.gov/flood-mitigation-assistance-program>

Detailed program and application information for federal post-disaster and pre-disaster programs can be found in the FY15 Hazard Mitigation Assistance Unified Guidance, available at: <https://www.fema.gov/media-library/assets/documents/103279>. Note that guidance regularly changes. Verify that you have the most recent edition. Flood mitigation assistance is usually offered annually; applications are submitted online. Applicants need a user profile approved by the State Hazard Mitigation Officer, which should be garnered well before the application period opens.

For Oregon Office of Emergency Management (OEM) grant guidance on Federal Hazard Mitigation Assistance, visit:

<https://www.oregon.gov/OEM/emresources/Grants/Pages/HMA.aspx>

Contact: Amie Bashant, amie.bashant@state.or.us or shmo@mil.state.or.us

State Programs

Special Public Works Fund

The Special Public Works Fund (SPWF) provides funds for publicly owned facilities that support economic and community development in Oregon. Funds are available to public entities for: planning, designing, purchasing, improving and constructing publicly owned facilities, replacing publicly owned essential community facilities, and emergency projects as a result of a disaster. Public agencies that are eligible to apply include: cities, counties, county service districts, (organized under ORS Chapter 451), tribal councils, ports, districts as defined in ORS 198.010, and airport districts (ORS 838). Facilities and infrastructure projects that are eligible for funding are: airport facilities, buildings and associated equipment, levee accreditation, certification, and repair, restoration of environmental conditions on publicly-owned industrial lands, port facilities, wharves, and docks, the purchase of land, rights of way and easements necessary for a public facility, telecommunications facilities, railroads, roadways and bridges, solid waste disposal sites, storm drainage systems, wastewater systems, and water systems. <https://www.orinfrastructure.org/Infrastructure-Programs/SPWF/>

Seismic Rehabilitation Grant Program

The Seismic Rehabilitation Grant Program (SRGP) provides state funds to strengthen public schools and emergency services buildings so they will be less damaged during an earthquake. Reducing property damage, injuries, and casualties caused by earthquakes is the goal of the SRGP. <http://www.orinfrastructure.org/Infrastructure-Programs/Seismic-Rehab/>

Community Development Block Grant Program

The Community Development Block Grant Program promotes viable communities by providing: 1) decent housing; 2) quality living environments; and 3) economic opportunities, especially for low and moderate income persons. Eligible activities most relevant to natural hazards mitigation include: acquisition of property for public purposes; construction/reconstruction of public infrastructure; community planning activities. Under special circumstances, CDBG funds also can be used to meet urgent community development needs arising in the last 18 months which pose immediate threats to health and welfare.

http://portal.hud.gov/hudportal/HUD?src=/program_offices/comm_planning/communitydevelopment/programs

Oregon Watershed Enhancement Board

While OWEB's primary responsibilities are implementing projects addressing coastal salmon restoration and improving water quality statewide, these projects can sometimes also benefit efforts to reduce flood and landslide hazards. In addition, OWEB conducts watershed workshops for landowners, watershed councils, educators, and others, and conducts a biennial conference highlighting watershed efforts statewide. Funding for OWEB programs comes from the general fund, state lottery, timber tax revenues, license plate revenues, angling license fees, and other sources. OWEB awards approximately \$20 million in funding annually. More information at: <http://www.oregon.gov/OWEB/Pages/index.aspx>

Federal Mitigation Programs, Activities & Initiatives

Basic & Applied Research/Development

National Earthquake Hazard Reduction Program (NEHRP), National Science Foundation.

Through broad based participation, the NEHRP attempts to mitigate the effects of earthquakes. Member agencies in NEHRP are the US Geological Survey (USGS), the National Science Foundation (NSF), the Federal Emergency Management Agency (FEMA), and the National Institute for Standards and Technology (NIST). The agencies focus on research and development in areas such as the science of earthquakes, earthquake performance of buildings and other structures, societal impacts, and emergency response and recovery. <http://www.nehrp.gov/>

Decision, Risk, and Management Science Program, National Science Foundation.

Supports scientific research directed at increasing the understanding and effectiveness of decision making by individuals, groups, organizations, and society. Disciplinary and interdisciplinary research, doctoral dissertation research, and workshops are funded in the areas of judgment and decision making; decision analysis and decision aids; risk analysis,

perception, and communication; societal and public policy decision making; management science and organizational design. The program also supports small grants for exploratory research of a time-critical or high-risk, potentially transformative nature.

http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=5423

Hazard ID and Mapping

National Flood Insurance Program: Flood Mapping; FEMA

Flood insurance rate maps and flood plain management maps for all NFIP communities.

<http://www.fema.gov/national-flood-insurance-program-flood-hazard-mapping>

National Map: Orthoimagery, DOI – USGS

Develops topographic quadrangles for use in mapping of flood and other hazards.

<https://nationalmap.gov/ortho.html>

Mapping Standards Support, DOI-USGS

Expertise in mapping and digital data standards to support the National Flood Insurance Program. <http://ncgmp.usgs.gov/standards.html>

Soil Survey, USDA-NRCS

Maintains soil surveys of counties or other areas to assist with farming, conservation, mitigation or related purposes. http://soils.usda.gov/survey/printed_surveys/

Project Support

Coastal Zone Management Program, NOAA

Provides grants for planning and implementation of non-structural coastal flood and hurricane hazard mitigation projects and coastal wetlands restoration.

<http://coastalmanagement.noaa.gov/>

Community Development Block Grant Entitlement Communities Program, US Department of Housing and Urban Development

Provides grants to entitled cities and urban counties to develop viable communities (e.g., decent housing, a suitable living environment, expanded economic opportunities), principally for low- and moderate- income persons.

http://portal.hud.gov/hudportal/HUD?src=/program_offices/comm_planning/communitydevelopment/programs/entitlement

National Fire Plan (DOI – USDA)

The NFP provides technical, financial, and resource guidance and support for wildland fire management across the United States. This plan addresses five key points: firefighting, rehabilitation, hazardous fuels reduction, community assistance, and accountability.

<http://www.forestsandrangelands.gov/>

Assistance to Firefighters Grant Program, FEMA

FEMA AFGM grants are awarded to fire departments to enhance their ability to protect the public and fire service personnel from fire and related hazards. Three types of grants are available: Assistance to Firefighters Grant (AFG), Fire Prevention and Safety (FP&S), and Staffing for Adequate Fire and Emergency Response (SAFER).

<http://www.fema.gov/welcome-assistance-firefighters-grant-program>

Emergency Watershed Protection Program, USDA-NRCS

Provides technical and financial assistance for relief from imminent hazards in small watersheds, and to reduce vulnerability of life and property in small watershed areas damaged by severe natural hazard events.

<http://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/landscape/ewpp>

Rural Development Assistance – Utilities, USDA

Direct and guaranteed rural economic loans and business enterprise grants to address utility issues and development needs.

http://www.rurdev.usda.gov/Utilities_Programs_Grants.html

Rural Development Assistance – Housing, USDA

The RDA program provides grants, loans, and technical assistance in addressing rehabilitation, health and safety needs in primarily low-income rural areas. Declaration of major disaster necessary. <http://www.rurdev.usda.gov/HAD-HCFPGGrants.html>

Public Assistance Grant Program, FEMA

The objective of FEMA Public Assistance (PA) Grant Program is to aid State, Tribal and local governments, and certain types of Private Nonprofit organizations so that communities can quickly respond to and recover from major disasters or emergencies declared by the President. <http://www.fema.gov/public-assistance-local-state-tribal-and-non-profit>

National Flood Insurance Program, FEMA

The NFIP makes available flood insurance to residents of communities that adopt and enforce minimum floodplain management requirements. <http://www.fema.gov/national-flood-insurance-program>

HOME Investments Partnerships Program, HUD

The HOME IPP provides grants to states, local government and consortia for permanent and transitional housing (including support for property acquisition and rehabilitation) for low-income persons. <http://www.hud.gov/offices/cpd/affordablehousing/programs/home/>

Disaster Recovery Initiative, HUD

The DRI provides grants to fund gaps in available recovery assistance after disasters (including mitigation).

http://portal.hud.gov/hudportal/HUD?src=/program_offices/comm_planning/communitydevelopment/programs/dri

Emergency Management Performance Grants, FEMA

EMPG grants help state and local governments to sustain and enhance their all-hazards emergency management programs. <http://www.fema.gov/fy-2012-emergency-management-performance-grants-program>

Partners for Fish and Wildlife, DOI – FWS

The PFW program provides financial and technical assistance to private landowners interested in pursuing restoration projects affecting wetlands and riparian habitats. <http://www.fws.gov/partners/>

North American Wetland Conservation Fund, DOI-FWS

NAWC fund provides cost-share grants to stimulate public/private partnerships for the protection, restoration, and management of wetland habitats. <http://www.fws.gov/birdhabitat/Grants/index.shtm>

Federal Land Transfer / Federal Land to Parks Program, DOI-NPS

Identifies, assesses, and transfers available federal real property for acquisition for State and local parks and recreation, such as open space. <http://www.nps.gov/ncrc/programs/flp/index.htm>

Wetlands Reserve program, USDA-NCRS

The WR program provides financial and technical assistance to protect and restore wetlands through easements and restoration agreements. <http://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/easements/wetlands>

Secure Rural Schools and Community Self-Determination Act of 2000, US Forest Service

Reauthorized for FY2012, it was originally enacted in 2000 to provide five years of transitional assistance to rural counties affected by the decline in revenue from timber harvests on federal lands. Funds have been used for improvements to public schools, roads, and stewardship projects. Money is also available for maintaining infrastructure, improving the health of watersheds and ecosystems, protecting communities, and strengthening local economies. <http://www.fs.usda.gov/pts/>

APPENDIX F: COMMUNITY SURVEY

Survey Purpose and Use

The purpose of this survey was to gauge the overall perception of natural disasters, determine a baseline level of loss reduction activity for residents in the community and assess citizen's support for different types of individual and community risk reduction activities.

Data from this survey directly informs the natural hazards mitigation planning process. Yamhill County can use this survey data to enhance action item rationale and ideas for implementation. Other community organizations can also use survey results to inform their own outreach efforts. Data from the survey provides the County with a better understanding of desired outreach strategies (sources and formats) and a baseline understanding of community perceptions of natural hazards and resilience.

Background

Citizen involvement is a key component in the NHMP planning process. Citizens should have the opportunity to voice their ideas, interests and concerns about the impact of natural disasters on their communities.

According to Bierle¹, the benefits of citizen involvement include the following: (1) educate and inform public; (2) incorporate public values into decision making; (3) substantially improve the quality of decisions; (4) increase trust in institutions; (5) reduce conflict; and (6) ensure cost effectiveness.

The NHMP planning process provided opportunities for the public to engage through an on-line survey disseminated by Yamhill County.

Methodology

In the summer of 2019, the Oregon Partnership for Disaster Resilience (OPDR) administered the survey via the on-line tool (Qualtrics). The survey was distributed via city and county social media and websites in Yamhill County. Survey responses were received from a total of 175 respondents (150 responses were complete, and 25 responses were partially complete).

The survey consisted of 28 questions. Yamhill County designed the survey to determine public perceptions and opinions regarding natural hazards and mitigation priorities.

The intent of this survey was not to be statistically valid but instead to gain the perspective and opinions of residents regarding natural hazards in the region. Our assessment is that the

¹ Bierle, T. 1999. Using social goals to evaluate public participation in environmental decisions. *Policy Studies Review*. 16(3/4), 75-103.

results reflect a range attitudes and opinions of residents throughout the county. Results are provided below for the County; specific results are provided for each city as applicable.

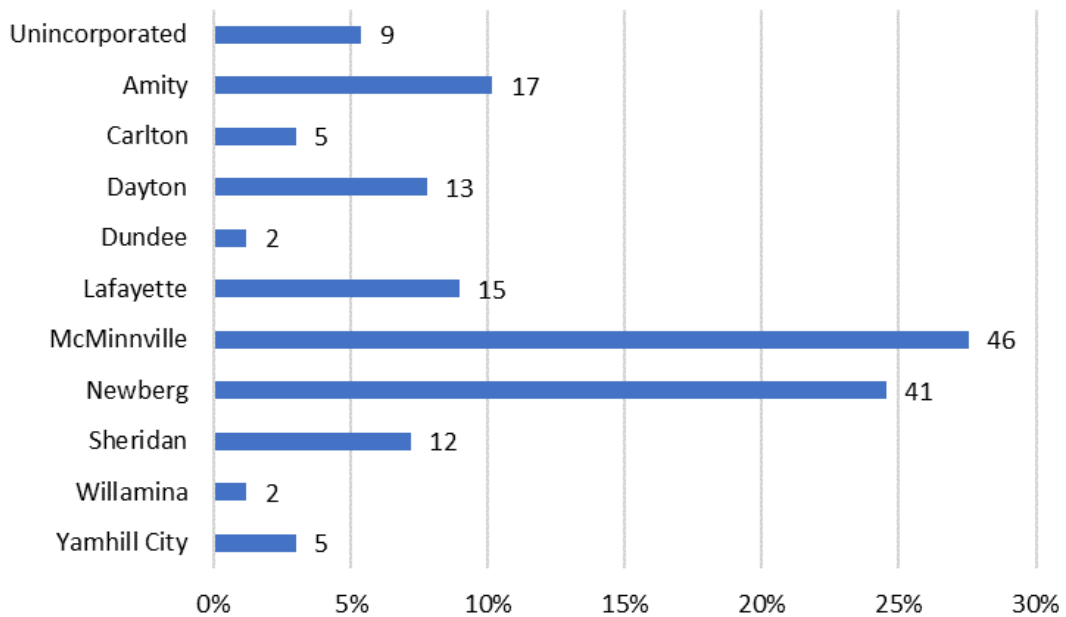
Survey Results

This section presents the compiled data and analysis for the 2019 Yamhill County NHMP Community Survey.

Respondent Characteristics

Most respondents (52%) indicated that they live either in McMinnville (28%) or Newberg (25%). Nine respondents (5%) lived in unincorporated parts of the County. The cities of Dundee and Willamina had the fewest respondents to the survey.

Figure F-1 Respondent Place of Residence (167 respondents)



Source: 2019 NHMP Community Survey, analysis by OPDR

Natural Hazard Information

This section reports the experiences of survey respondents involving natural hazards and their exposure to preparedness information.

The survey asked respondents to indicate their level of concern about natural hazards that impact Yamhill County. Table F-1 shows that respondents were “very concerned” about earthquake (33%) and wildfire (31%) and “somewhat concerned” about the hazards of winter storm (49%), earthquake (48%), wildfire (44%), and windstorm (43%). Respondents were least concerned about the volcanic event and landslide hazards.

Table F-1 Hazards that Concern Respondent the Most

Hazard	Very Concerned	Somewhat Concerned	Not Very Concerned	Not Concerned	Total Responses
Drought	16%	33%	35%	16%	162
Earthquake	33%	48%	15%	4%	165
Flood	11%	38%	33%	18%	159
Landslide	3%	18%	47%	32%	159
Volcanic Event	1%	15%	42%	43%	158
Wildfire	31%	44%	18%	7%	163
Windstorm	7%	43%	36%	14%	161
Winter Storm (Snow/Ice)	13%	49%	30%	8%	162
Other:^	32%	26%	16%	26%	19

Source: 2019 NHMP Community Survey, analysis by OPDR

^ "Other" responses included: traffic jams, power outage/internet outage/phone outage, not getting out of Dayton if the bridges, clovers are out there is now way out of town, the meth heads, rising temperatures (climate change), residents wells drying up and no access to clean water, pesticide drifts, parasite transmitted disease, mole people, liquefaction, Governor Brown, general fire, drugs and mental illness.

Table F-2 shows survey respondents' hazards of highest and lowest concern by jurisdiction.

Table F-2 Hazards of Highest and Lowest Concern by Jurisdiction

	Highest Concern (Hazards)	Lowest Concern (Hazards)	Total Responses
Unincorporated	Wildfire, earthquake, flood	Volcanic event, landslide, windstorm	9
Amity	Earthquake, winter storm, windstorm, wildfire	Volcanic event, landslide	14 to 16
Carlton	Earthquake, wildfire, drought	Volcanic event, windstorm, winter storm	5
Dayton	Earthquake, windstorm, drought, flood	Volcanic event, landslide	11 to 13
Dundee	Earthquake	Volcanic event, flood	2
Lafayette	Earthquake, drought, wildfire	Landslide, volcanic event, flood	14-15
McMinnville	Wildfire, earthquake, winter storm	Landslide, volcanic event	45-46
Newberg	Earthquake, wildfire, winter storm	Volcanic event, landslide, drought	38-40
Sheridan	Flood, earthquake, wildfire, winter storm	Volcanic event, landslide, drought	12
Willamina	Drought, earthquake, wildfire	Volcanic event	2
Yamhill City	Drought, earthquake, wildfire, windstorm	Landslide, volcanic event, flood, winter storm	5

Source: 2019 NHMP Community Survey, analysis by OPDR

Community Assets Vulnerable to Hazards

The survey addressed the issue of which community assets respondents felt were most vulnerable to natural hazards. Shown below in Table F-3, 93% of respondents perceived that infrastructure is very vulnerable or somewhat vulnerable to hazards. Furthermore, 79% of respondents ranked economic assets as very vulnerable or somewhat vulnerable. Also ranked as vulnerable were governance (76%), human assets (70%) and environmental assets (67%).

Table F-3 Community Assets Vulnerable to Hazards

Asset/Hazard	Very Vulnerable	Somewhat Vulnerable	Neutral	Not Very Vulnerable	Not Vulnerable	Total Responses
Human	22%	48%	20%	10%	1%	157
Economic	36%	43%	17%	4%	0%	154
Infrastructure	60%	33%	7%	1%	0%	156
Cultural/Historic	19%	40%	26%	13%	1%	156
Environmental	33%	34%	21%	10%	2%	155
Governance	35%	41%	17%	5%	2%	156

Source: 2019 NHMP Community Survey, analysis by OPDR

Table F-4 shows the top community asset vulnerability ranking by jurisdiction. Respondents from ten out of eleven jurisdictions responded that infrastructure was very or somewhat vulnerable to hazards. Furthermore, respondents from eight out of eleven jurisdictions replied that economic assets were very or somewhat vulnerable.

Table F-4 Community Asset Vulnerability by Jurisdiction

	Very or Somewhat Vulnerable	Number of Responses
Unincorporated	Infrastructure, Economic, Environmental	9
Amity	Infrastructure, Government, Economic	16
Carlton	Infrastructure	4
Dayton	Infrastructure, Economic, Government	12
Dundee	Infrastructure, Economic, Human Life	2
Lafayette	Infrastructure, Economic, Human Life	14
McMinnville	Infrastructure, Economic, Human Life	44
Newberg	Infrastructure, Government, Economic	37
Sheridan	Government, Infrastructure, Economic	12
Willamina	Government	2
Yamhill City	Infrastructure, Government	5
Total Responses		157

Source: 2019 NHMP Community Survey, analysis by OPDR

Mitigation Efforts

The survey asked respondents to indicate what types of community assets are most important to them. Hospitals (86%), Major Bridges (75%), and Police/fire stations (74%) were among the most rated as very important. Also, 51% of the respondents rated major employers (51%) and city hall/courthouse (44%) as somewhat important.

Table F-5 Community Assets Ranked by Level of Importance to Respondent

Community Assets	Very Important	Somewhat Important	Neutral	Not Very Important	Not Important	Total Responses
Elder-care Facilities	48%	31%	18%	3%	1%	153
Schools (K-12)	55%	29%	13%	2%	1%	154
Hospitals	86%	12%	1%	1%	1%	154
Major Bridges	75%	19%	5%	1%	0%	153
Fire/Police Stations	74%	22%	3%	1%	0%	152
Museums/Historic Buildings	14%	43%	27%	11%	4%	153
Major Employers	18%	51%	25%	2%	3%	152
Small Businesses	46%	37%	16%	1%	1%	153
College / University	16%	38%	29%	10%	7%	153
City Hall / Courthouse	25%	44%	20%	7%	3%	153
Parks	22%	34%	29%	9%	7%	152

Source: 2019 NHMP Community Survey, analysis by OPDR

A total of 23 Other responses were provided by respondents. Below is a list of the facility categories that were list as Other: electrical grid, agriculture/food, water supply, drinking water for wells, highways/byways, grocery stores/areas of commerce/food banks, community theater, utilities, sanitation/sewage treatment, wineries and farms, foster homes, medical, churches, rural character, code enforcement, nursing homes/assisted living facilities, adult foster care, community centers, forestry management, library

Table F-6 shows the top-rated community asset importance by jurisdiction. Respondents from all eleven jurisdictions said that police/fire stations were very or somewhat important. Furthermore, respondents from ten of eleven jurisdictions responded that hospitals were very or somewhat important.

Table F-6 Community Asset Importance by Jurisdiction

	Very or Somewhat Important	Not Very or Not Important	Number of Responses
Unincorporated	Hospitals, Major Bridges, Police/Fire Stations	Museums/Historic Buildings	8
Amity	Major Bridges, Police/Fire Stations, Hospitals, Schools (K-12)	Other	16
Carlton	Hospitals, Major Bridges, Police/Fire Stations	N/A	4
Dayton	Major Bridges, Police/Fire Stations, Hospitals, Small Businesses	Other	12
Dundee	Major Bridges, Police/Fire Stations, Hospitals, Schools (K-12), Elder Care, Major Employers	Museums/Historic Buildings, Other	2
Lafayette	Hospitals, Police/Fire Stations, Schools (K-12)	Parks	14
McMinnville	Hospitals, Police/Fire Stations, Major Bridges	Other	43
Newberg	Hospitals, Police/Fire Stations, Major Bridges	Other	37
Sheridan	Hospitals, Police/Fire Stations, Major Bridges, Small Businesses	Museums/Historic Buildings, Parks	12
Willamina	All	N/A	1
Yamhill City	Hospitals, Police/Fire Stations, Major Bridges	College/University, Parks	5
Total Responses			154

Source: 2019 NHMP Community Survey, analysis by OPDR

Priorities Planning for Natural Hazards

Table F-7 shows respondent priorities regarding planning for natural hazards. Protecting critical facilities such as transportation networks, hospitals, and fire stations (98%), strengthening emergency services such as police, fire, and ambulance (97%), and protecting and reducing damage to utilities (96%) were ranked very important or somewhat important.

Table F-7 Priorities Planning

Priorities Planning for Natural Hazards	Very Important	Somewhat Important	Neutral	Not Very Important	Not Important	Total Responses
Protecting property	54%	35%	9%	3%	0%	151
Protecting critical facilities	90%	8%	2%	0%	0%	151
Preventing development in hazard areas	51%	34%	12%	3%	1%	150
Enhancing the function of natural features	47%	28%	20%	3%	1%	148
Protecting historical and cultural landmarks	23%	39%	29%	6%	3%	150
Protecting and reducing damage to utilities	68%	28%	4%	0%	0%	151
Strengthening emergency services	73%	25%	2%	1%	0%	151
Disclosing hazard risks for real estate transactions	63%	27%	9%	1%	0%	150
Promoting cooperation among agencies	62%	28%	9%	1%	1%	151

Source: 2019 NHMP Community Survey, analysis by OPDR

Table F-8 breaks down priorities planning by jurisdiction in Yamhill County.

Table F-8 Priorities Planning by Jurisdiction

	Very or Somewhat Important	Not Very or Not Important	Number of Responses
Unincorporated	Critical Facilities, Utilities, Emergency Services	Natural Features, Historic/Cultural Landmarks, Promoting Cooperation	7
Amity	Critical Facilities, Preventing Development, Emergency Services, Disclosing Hazards, Promoting Cooperation	N/A	15
Carlton	Private Property, Critical Facilities, Utilities, Emergency Services, Promoting Cooperation	Natural Features, Historic/Cultural Landmarks	4
Dayton	Critical Facilities, Utilities, Disclosing Hazards, Emergency Services	Historic/Cultural Landmarks	12
Dundee	All	N/A	2
Lafayette	Critical Facilities, Utilities, Emergency Services	N/A	13
McMinnville	Critical Facilities, Emergency Services, Utilities	Historic/Cultural Landmarks	43
Newberg	Emergency Services, Critical Facilities, Utilities	Natural Features, Historic/Cultural Landmarks	37
Sheridan	Critical Facilities, Utilities, Emergency Services, Promoting Cooperation	Preventing Development	12
Willamina	All except Disclosing Hazards	N/A	1
Yamhill City	All	N/A	5
Total Responses			151

Source: 2019 NHMP Community Survey, analysis by OPDR

Awareness of County/City Preparedness for Natural Hazards

Table F-8 shows Yamhill County residents' opinions on the county and city preparedness for different types of natural hazards. Not many respondents rated Yamhill county or cities as very prepared, but over half of respondents said that they believe the county and cities were somewhat prepared for wildfires (54%), and this was followed closely by winter storms (46%), windstorms (45%), and floods (44%). Respondents also noted that Yamhill County is not very prepared for landslides (48%) and earthquakes (46%).

Table F-9 Preparedness for Natural Hazards

Preparedness for Natural Hazards	Very Prepared	Somewhat Prepared	Not Very Prepared	Not Prepared	Total Responses
Drought	3%	40%	39%	18%	123
Earthquake	1%	36%	46%	18%	129
Flood	1%	44%	41%	14%	124
Landslide	1%	25%	48%	25%	106
Volcanic Event	1%	18%	41%	40%	107
Wildfire	7%	54%	26%	13%	125
Windstorm	8%	45%	35%	11%	119
Winter Storm (Snow/Ice)	5%	46%	33%	15%	132
Other	0%	22%	11%	67%	9

Source: 2019 NHMP Community Survey, analysis by OPDR

A total of 7 Other responses were provided by respondents. Below is a list of the facility categories that were list as Other: rural properties that lose their wells and have no other means for water, human caused violence, water contamination, natural gas explosion/chemical disasters, drugs/mental illness/homelessness, climate change

Table F-10 breaks down respondents' opinions on natural hazard preparedness by jurisdiction.

Table F-10 Preparedness for Natural Hazards by Jurisdiction

	Very or Somewhat Prepared	Not Very or Not Prepared	Number of Responses
Unincorporated	Flood, Wildfire	Volcanic Event	6
Amity	Windstorm, Wildfire, Winter Storm	Volcanic Event, Earthquake, Drought	11
Carlton	Windstorm, Wildfire, Winter Storm	Earthquake, Flood, Landslide, Volcanic Event	4
Dayton	Wildfire	Volcanic Event, Landslide	11
Dundee	All except Volcanic Event	Volcanic Event	2
Lafayette	Wildfire	All	8
McMinnville	Wildfire, Winter Storm, Windstorm	Volcanic Event, Landslide, Earthquake	31
Newberg	Winter Storm, Windstorm, Flood	Volcanic Event, Landslide, Earthquake	26
Sheridan	Flood, Wildfire	Volcanic Event, Landslide	9
Willamina	All	N/A	1
Yamhill City	Winter Storm	Windstorm, Landslide, Flood	5
Total Responses			114

Source: 2019 NHMP Community Survey, analysis by OPDR

Table F-11 shows respondent level of awareness of activities that Yamhill County is taking to reduce individual risk (life/property) from specific natural hazards. The table shows that respondents are not extremely aware of County actions to reduce individual risk. Respondents have greatest awareness of county actions to reduce risk to earthquake, wildfire, and winter storm. Respondents have the least awareness for actions related to volcanic events, landslides, and windstorms.

Table F-11 Awareness of Yamhill County action to reduce individual risk (life/property) from specific natural hazards

Natural Hazards	Extremely Aware	Moderately Aware	Somewhat Aware	Slightly Aware	Total Responses
Drought	0%	31%	27%	42%	62
Earthquake	8%	22%	34%	36%	87
Flood	1%	24%	35%	39%	74
Landslide	2%	20%	35%	43%	49
Volcanic Event	2%	23%	21%	54%	48
Wildfire	9%	35%	24%	32%	82
Windstorm	4%	33%	25%	38%	73
Winter Storm (Snow/Ice)	6%	29%	34%	30%	82
Other:	0%	0%	100%	0%	4

Source: 2019 NHMP Community Survey, analysis by OPDR

Table F-12 breaks down respondents’ opinions on awareness of county or city activities to prepare for natural hazards by jurisdiction.

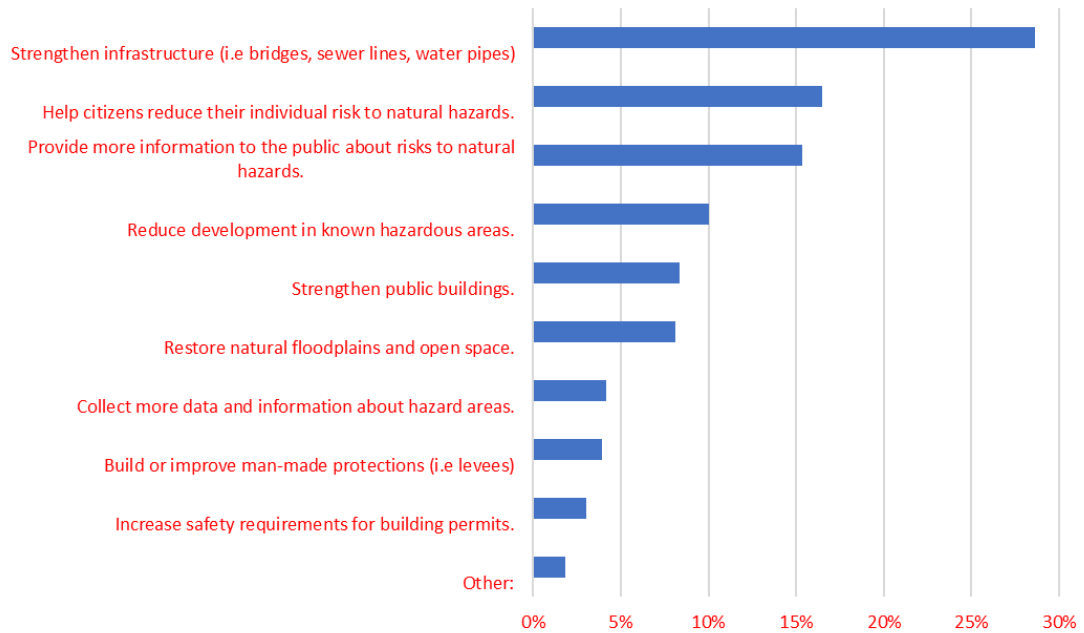
Table F-12 Awareness of Natural Hazard Preparedness by Jurisdiction

	Extremely Aware/ Moderately Aware	Somewhat Aware/ Slightly Aware
Unincorporated	Wildfire, Winter storm	Flood, landslide, volcanic event
Amity	Wildfire, Windstorm, winter storm	landslide, volcanic event
Carlton	Earthquake, wildfire, winter storm	-
Dayton	Earthquake, wildfire, flood	wildfire, winter storm
Dundee	-	-
Lafayette	Winter storm	Earthquake, flood
McMinnville	Windstorm, winter storm	Earthquake, volcanic event
Newberg	Wildfire	Drought, Volcanic Event
Sheridan	Wildfire, winter storm	landslide, volcanic event
Willamina	-	-
Yamhill City	-	-

Source: 2019 NHMP Community Survey, analysis by OPDR
 Note: “-” indicates not enough data to make a determination

Figure F-2 shows respondent preference for activities the County should take to reduce risk from natural hazards. Just under 30% of respondents preferred the county Strengthen Infrastructure, 17% preferred the county assist residents reduce their risk to natural hazards, and 15% preferred the County provide more information to the public about the risks from natural hazards.

Figure F-2 Most important things that should be done to reduce risk from natural hazards



Source: 2019 NHMP Community Survey, analysis by OPDR

A total of 7 Other responses were provided by respondents including the following: new equipment for fire department, identify unknown hazard areas, strengthen communication-based infrastructure, share emergency plans with community in easy to read format, bring irrigation from Hagg lake project, and need to engage Latino community.

Table F-13 breaks down respondents’ most important activities to be done to mitigate natural hazards by jurisdiction.

Table F-13 Top Mitigation Activities by Jurisdiction

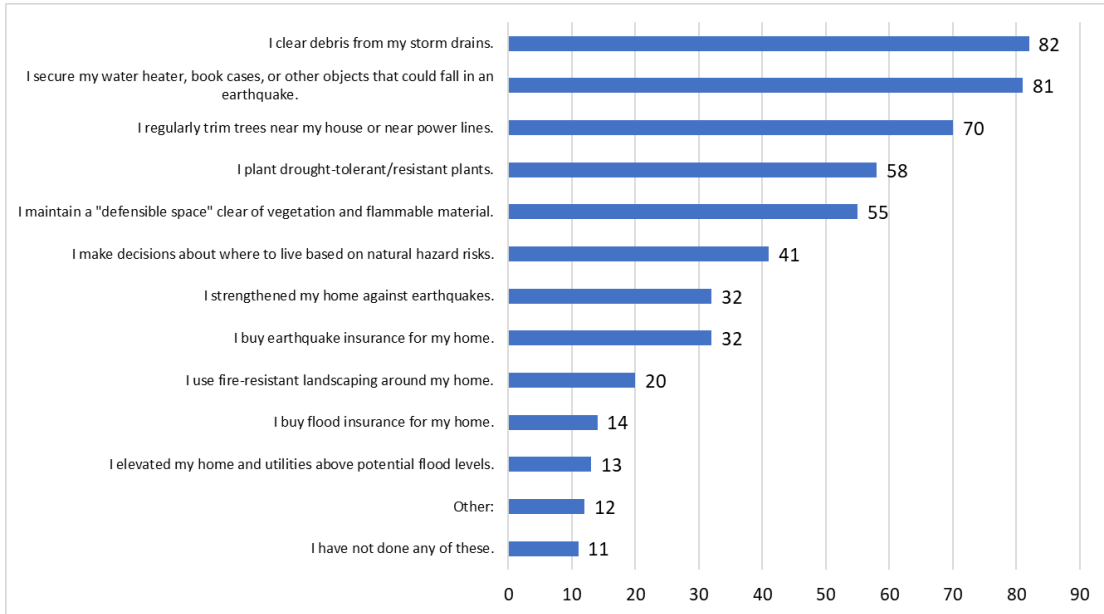
	Unincorporated	Amity	Carlton	Dayton	Dundee	Lafayette	McMinnville	Newberg	Sheridan	Willamina	Yamhill City
Provide more information to the public about risks to natural hazards.	X	X		X	X	X	X	X	X		
Strengthen public buildings.	X		X	X							
Reduce development in known hazardous areas.					X					X	X
Restore natural floodplains and open space.	X			X						X	X
Build or improve man-made protections (i.e levees)											
Strengthen infrastructure (i.e bridges, sewer lines, water pipes)	X	X	X	X	X	X	X	X	X	X	X
Increase safety requirements for building permits.											
Collect more data and information about hazard areas.											
Help citizens reduce their individual risk to natural hazards.		X	X	X	X	X	X	X	X		

Source: 2019 NHMP Community Survey, analysis by OPDR

Figure F-3 shows activities that respondents take to improve the safety of themselves and families in the event of a disaster. Approximately 80 respondents clear debris from storm

drains and secure water heater, bookcases, and other objects that may fall in an earthquake. About 70 respondents regularly trim trees, while another 58 plant drought-tolerant plants, and 55 maintain a defensible space for wildfire protection.

Figure F-3 Steps taken to reduce individual/family risk from disaster event



Source: 2019 NHMP Community Survey, analysis by OPDR

A total of 12 "other" responses were provided by respondents including the following: I don't own a home. I am a student, can't afford to do most of these, Health advocacy: I have no expectation to survive an event as I would assume I would run out of medication and my insurance does not allow me to keep a personal inventory, i am 60 low income, I've taken emergency training classes, Stock emergency supplies, I have built emergency response kits, I rent, I live in an apartment complex that does not do most of these, All but the first, Not in charge of insuring my living space.

Table F-14 breaks down respondents' steps that they take to improve personal or family safety in the event of a disaster.

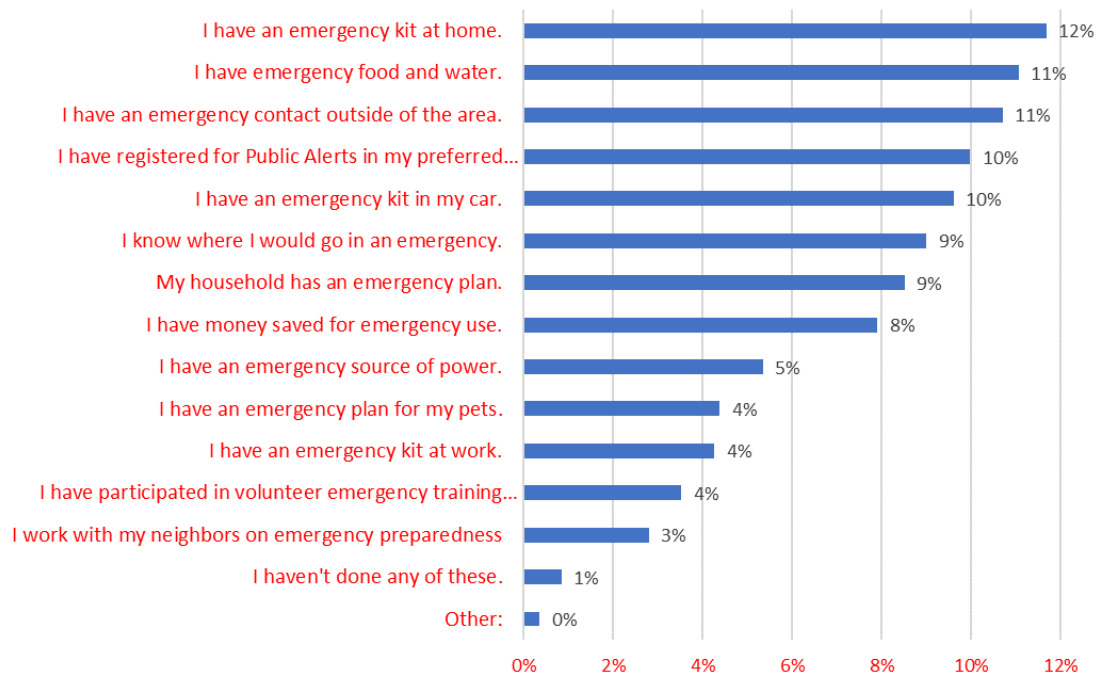
Table F-14 Steps individuals take to improve personal/family safety by jurisdiction

	Unincorporated	Amity	Carlton	Dayton	Dundee	Lafayette	McMinnville	Newberg	Sheridan	Willamina	Yamhill City
I buy flood insurance for my home.											
I elevated my home and utilities above potential flood levels.											
I clear debris from my storm drains.	X	X	X			X	X	X	X	X	X
I plant drought-tolerant/resistant plants.	X	X	X			X	X	X	X	X	
I buy earthquake insurance for my home.											X
I strengthened my home against earthquakes.	X			X	X						X
I secure my water heater, book cases, or other objects that could fall in an earthquake.	X	X	X	X	X	X	X	X	X	X	X
I maintain a "defensible space" clear of vegetation and flammable material.	X	X	X	X	X	X			X	X	X
I use fire-resistant landscaping around my home.											
I regularly trim trees near my house or near power lines.	X	X	X	X		X	X	X	X	X	X
I make decisions about where to live based on natural hazard risks.	X	X			X	X	X				X
I have not done any of these.											

Source: 2019 NHMP Community Survey, analysis by OPDR

Figure F-4 shows additional steps that individuals have taken to be prepared for an emergency. Among the most responses were having an emergency kit at home (12%), having emergency food and water (11%), having an emergency contact who lives outside of the area (11%), registering for Public Alerts (10%), and having an emergency kit in their car (10%).

Figure F-4 Steps taken to be prepared for an emergency



Source: 2019 NHMP Community Survey, analysis by OPDR

A total of two (2) “other” responses were provided by respondents including the following: Spouse has done CERT training, added blood coagulating powder to emergency kit, added emergency radio, learned how to open garage door manually if power fails in emergency, learned how to turn off propane tank, hot water heater, have propane cooking device, make sure vehicles always have at least half tank of gas.

Table F-15 breaks down respondents’ steps take to prepare for an emergency by jurisdiction.

Table F-15 Steps individuals have taken to prepare for an emergency by jurisdiction

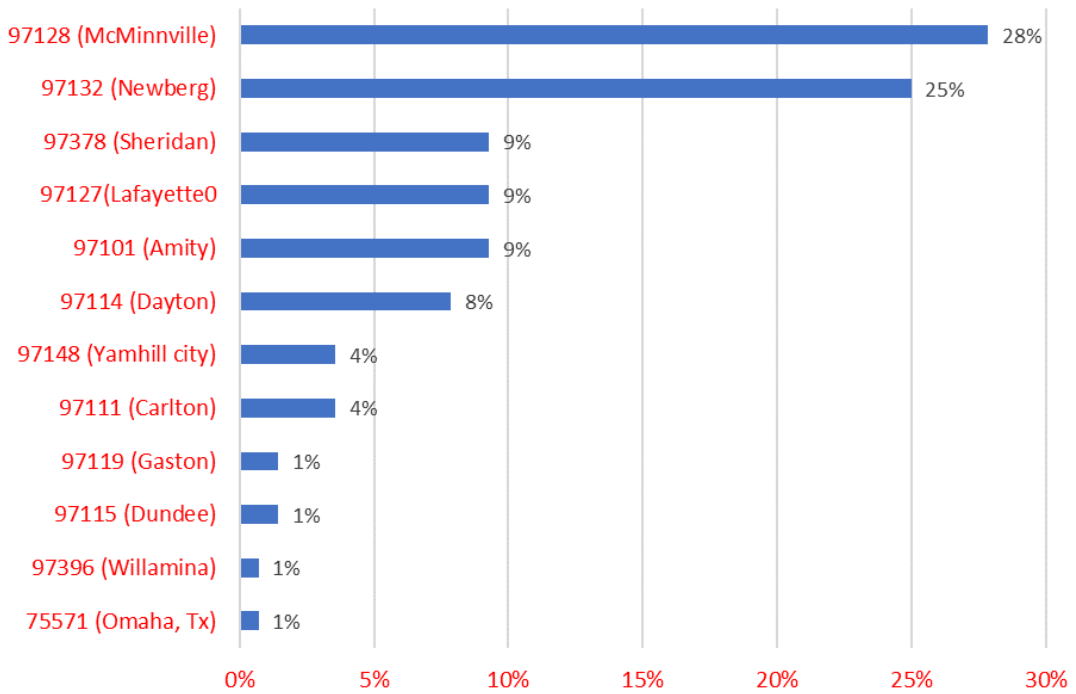
	Unincorporated	Amity	Carlton	Dayton	Dundee	Lafayette	McMinnville	Newberg	Sheridan	Williamina	Yamhill City
I work with my neighbors on emergency preparedness										X	
I have registered for Public Alerts in my preferred language.	X	X		X	X	X	X	X	X		X
I have an emergency kit at home.	X	X	X	X	X	X	X	X	X	X	X
I have an emergency kit in my car.	X	X	X	X	X	X	X	X	X	X	X
I have an emergency kit at work.										X	
My household has an emergency plan.	X	X	X	X	X	X	X	X	X	X	
I have an emergency plan for my pets.				X					X	X	
I have participated in volunteer emergency training exercises (i.e. CERT)											
I have an emergency source of power.	X		X	X			X				X
I have emergency food and water.	X	X	X	X	X	X	X	X	X	X	X
I have an emergency contact outside of the area.	X	X	X	X		X	X	X	X	X	X
I know where I would go in an emergency.		X	X	X	X	X	X	X	X	X	X
I have money saved for emergency use.	X	X	X	X	X	X	X	X	X		X
I haven't done any of these.											

Source: 2019 NHMP Community Survey, analysis by OPDR

Primary or Secondary Residence

Almost all respondents either own or rent a primary residence in Yamhill County (142 of 143). Of those more than 50% of respondents are from the two most populous cities in the county: McMinnville area (28%) or Newberg area (25%). Less than 4% (5 total) of respondents own at least one secondary residence in Yamhill County (four of these residences are in Newberg and one is in McMinnville and all five are investment/rental properties).

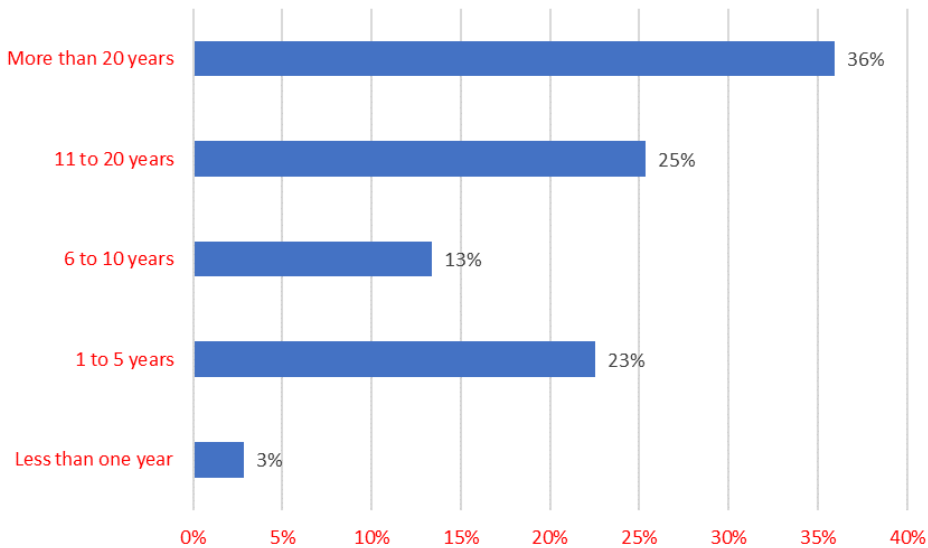
Figure F-5 Zip code of respondent primary residence (n=140)



Source: 2019 NHMP Community Survey, analysis by OPDR

Of those who have a primary residence in Yamhill County more than one-third (36%) have lived in the county for more than 20 years while another 25% have lived in the county between 11-20 years. About 40% of respondents have had a primary residence in the county 10 years or less. Of those who own a second residence three have been owned for 10 years or less and two have been owned between 11 and 20 years.

Figure F-6 Length of residence in primary home in Yamhill County



Source: 2019 NHMP Community Survey, analysis by OPDR

Table F-16 shows the percent of respondents who have a primary residence in the County that report that their primary residence is at risk to the listed natural hazards. Almost 80% of residence perceive their home is at risk to earthquake, 76% perceive a risk to windstorm, and 60% report their home is at risk to wildfire. Of those that responded almost one-third are not sure if their home is vulnerable to volcanic events, while another 25% are not sure if their home is vulnerable to drought. Of those who own secondary residences (investment properties) the most commonly reported hazard risks are earthquake, windstorm, and winter storms.

Table F-16 Is Primary Home at Risk to the following natural hazards

Hazard	Yes	No	Not Sure	Total Responses
Drought	39.4%	35.8%	24.8%	137
Earthquake	79.6%	10.6%	9.9%	142
Flood	25.6%	57.7%	16.8%	137
Landslide	17.8%	62.2%	20.0%	135
Volcanic Event	34.6%	35.3%	30.2%	136
Wildfire	60.0%	21.4%	18.6%	140
Windstorm	75.9%	9.2%	14.9%	141
Winter Storm (snow/ice)	82.4%	7.8%	9.9%	142

Source: 2019 NHMP Community Survey, analysis by OPDR

Flood and Other Hazard Insurance

Fifteen respondents have flood insurance for their primary residence. Of those only two (2) are required to have flood insurance, ten (10) purchase it voluntarily, and three (3) are not sure if it is required. Additionally, 36% of respondents purchase other hazard insurance, 65% of these respondents purchase earthquake insurance, 24% purchase fire/wildfire, and 11% have wind/winter storm insurance. None of the respondents who have secondary residences (investment properties) have them insured for the flood hazard and only one is insured for any other hazard (earthquake).

Other comments:

Respondents were provided an opportunity to provide additional comments. Listed below are their responses:

- We need better ways out of town and a storm shelter and also better bridges out of town and emergency water power sewer etc lines
- OSU has computer models that show where and the effects of a Cascadia Event on line. I estimate over 95% of the population does not know how to access the information which is needed to develop a home emergency plan. Somehow the local communities/cities should continually make the web sites known by using the monthly water bill or trash bills, etc. as information points.
- Due to a chronic health condition and lack of personal inventory for my medication, if a catastrophic event took place in Oregon, I would strongly consider suicide to allow additional resources for my family’s extended survival. Health reform needs to be part of the conversation within infrastructure.

- at this time I don't
- Your last three questions are inappropriate!
- Do to President Trumps way of doing government and governe Brown rain in office citizens of Oregon and the United States are in trouble // BIG TROUBLE
- "I would value more education and clarity about what the county will do in terms of earthquake and fire. I have heard nothing from the county to the general residential population."
- Yamhill county is poorly prepared for a major disaster.
- We live above 700ft, flooding is unlikely to affect our home as even the Missoula flood did not reach that high, therefore no flood insurance; however, we would be trapped on our hill if any of the roads below us flooded!
- Thanks for putting out the survey! It gives me a lot to think about!
- i don't consider police to be emergency personnel and think we need to prioritize hospitals and fire fighters over police when making infrastructure decisions.
- "The biggest risk to Yamhill County is in the event of a substantial Earthquake. The core of Yamhill county (McMinnville) would become an island and land locked from bridge failures making the county resources limited to the remaining areas around the County. Also this would impair the ability for the core of the county to receive supplies due to the inability of ground travel for the movement of replenishment or arrival of new supplies to the the core county location.
- I have done volunteer work with the county under the Emergency Manager and was included in county exercises that simulated Earthquake situations, etc. The group I belonged to at the time (ARES) was to support communications City to City, City to County and County to State (Salem). This was so that if the county communications became compromised there would be a viable link for emergency purposes.
- There was a plan to build small communications resources for each city and placed at the Fire Stations so that in the time of need the resource would be in place and ready for use as well as annual training for those that would be operating the station(s).
- This was done through the ARES groups and coordinated through the county Emergency Manager and the County Sheriffs office under the Volunteer groups. "
- Wildfire or human caused. We are all vulnerable is what we learn from major fires in California. Fires caused by downed power lines; cause by sparking of lines not down; caused by someone burning (illegal or not, the burning). As we have seen from recent huge fires that have devastated many communities - wild or man caused - fire spreads rapidly and is a danger.
- Thanks for this effort: vital to the resilience of our community! Please also consider how climate change impacts & intensifies all these threats.
- We are an aging adult couple; we bought our 1942 home, which was flipped-updated in Amity May 2016. Aware of retirement by 2025 and intentions to sell property upon retirement and head to Oregon Coast to fulfill bucket list finality!
- I rent and am unaware of how to help prepare myself and my family of such events.
- Contact Yamhill County Commissioner Mary Starrett to help with your data collection. She is wise, amazing and intelligent
- Thank you!

Demographics of survey respondent

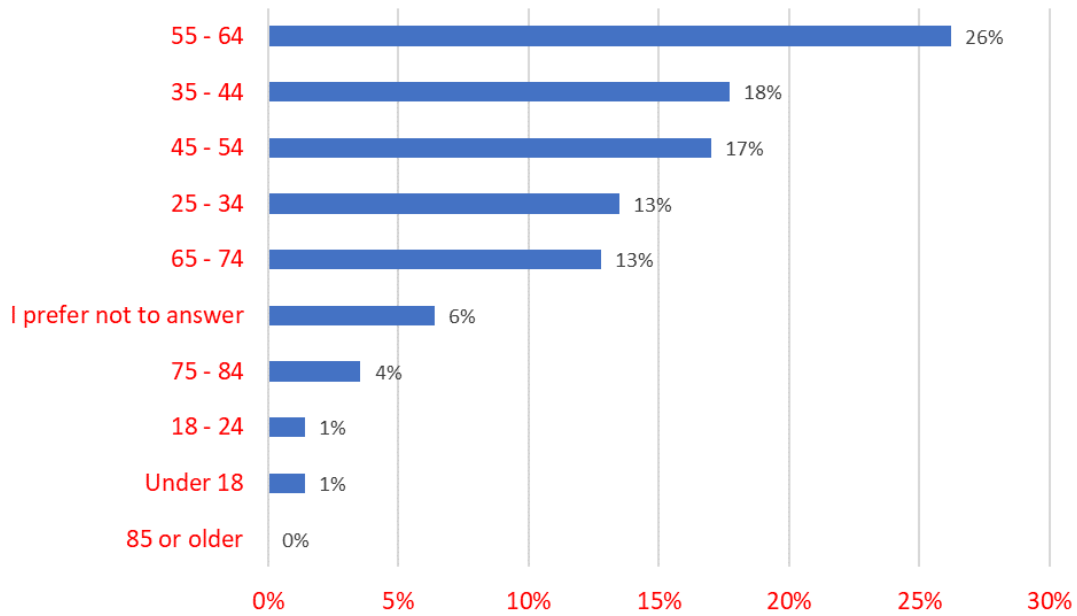
Gender

Just under 30% of survey respondents reported their gender as male, 59% female, and 11% chose not to provide an answer.

Age

Table X shows that the largest respondent group was in the 55 to 64 age group (26%); less than three percent of respondents were age 24 or younger.

Figure F-7 Respondent Age Groups

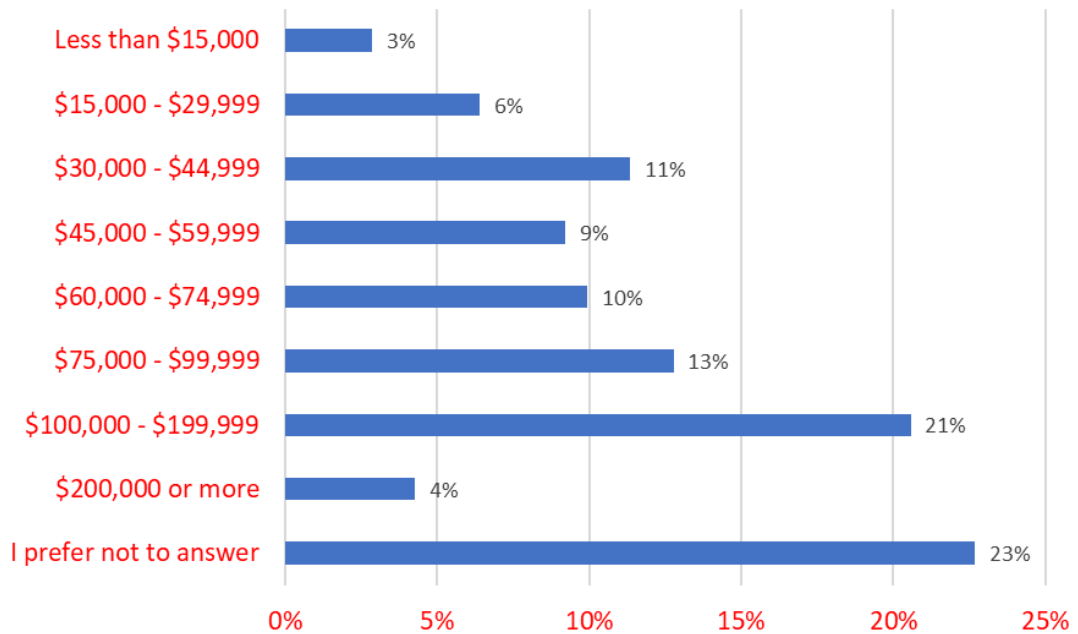


Source: 2019 NHMP Community Survey, analysis by OPDR

Income

Figure F-8 shows the income groups for respondents. About 25% of respondents had household incomes of \$100,000 or more and almost 25% prefer not to provide an answer. Less than 10% of respondents had household incomes below \$30,000.

Figure F-8 Household Income

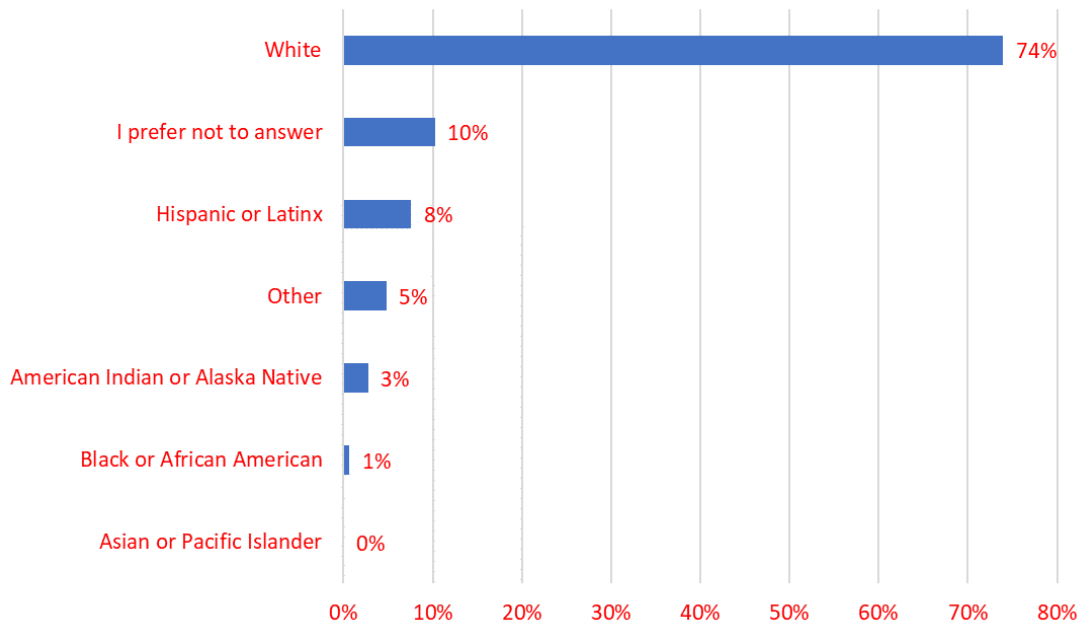


Source: 2019 NHMP Community Survey, analysis by OPDR

Race/ethnicity

Almost 75% of respondents reported that they were white. Another 8% reported that their ethnicity was Hispanic/Latinx. Ten percent of respondents did not provide an answer.

Figure F-9 Race or ethnic background



Source: 2019 NHMP Community Survey, analysis by OPDR

Conclusion

In general, the survey responses reinforced information collected by the plan update team (Steering Committee and consultant). As indicated in the survey there are a significant percentage of respondents who feel that the County could do more to outreach to the community about natural hazards. The steering committee reviewed the survey results and incorporated the findings into discussions about the mitigation plan update. Specifically, the survey helped to inform the priority actions and contributed to the overall assessment of risk in Yamhill County.