



# Marion County Multi-Jurisdictional Hazard Mitigation Plan

Marion County and the Cities of:  
Aumsville, Aurora, Detroit, Gates, Idanha, Keizer,  
Mill City, Silverton, Stayton, Turner and Woodburn



April 2017

Volume III: Appendices

**Prepared for:**  
Marion County Emergency Management

**Prepared by:**  
University of Oregon  
Community Service Center  
Community Planning Workshop &  
Oregon Partnership for Disaster Resilience



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# Marion County HMP Update Steering Committees

## Marion County

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Boyd Keyser	Superintendent	North Marion School District
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Brent Stevenson	Manager	Santiam Water Control District
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Dale Huitt	Deputy Sheriff	Marion County Sheriff
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Michael Johnson	Chair	East Salem Suburban Neighborhood Association
Randy Scott	Director	City of Woodburn Public Works
Rick Sebens	Chief of Police	City of Stayton Police Department
Roger Stevenson	Emergency Manager	City of Salem Emergency Management

## City of Aumsville

- Richard Schmitz, Chief of Police
- Steve Oslie, Public Works Director

## City of Aurora

- Kris Sallee, City Council
- Kelly Richardson, City Recorder
- Derrel Lockard, Public Works Superintendent
- Boyd Keyser, Marion County School District

### City of Detroit

- Christine Pavoni, City Recorder
- Robert Bruce, Certified Water Technician

### City of Gates

- Jerry Marr, Mayor
- Traci Archer, Recorder
- Leeroy Davis

### City of Idanha

- Karen Clark, Mayor
- Robert Bruce, Certified Water Technician

### City of Keizer

- Bill Lawyer, Public Works Director
- Jennifer Warner, Public Works Technician
- Mathias Reyes, Drinking Water Technician
- Nate Brown, Community Development Director
- Elizabeth Sagmiller, Environmental Division Manager
- Sam Litke, Senior Planner
- Shane Witham, Associate Planner

### City of Mill City

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- Stacie Cook, City Recorder

### City of Silverton

- Dianne Hunt, Emergency Manager
- Jeff Fossholm, Police Chief

### City of Stayton

- Dan Fleishman, Planning & Development Director
- Henry Porter, Mayor
- Rich Sebens, Emergency Manager
- Lance Ludwick, Public Works

### City of Turner

- David Sawyer, City Administrator
- Garry Tiffin, Mayor
- Richard Bates
- Chuck Roberts
- Larry Lullay
- John Taylor

### City of Woodburn

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- Randy Scott, Public Works Director
- Jim Ferraris, Chief of Police
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- Communications: Capital Community Television (CCTV), Amateur Radio Emergency Service (ARES), Marion Area Multi-Agency Emergency Telecommunications Dispatch Center (METCOM 911), Santiam Canyon Phone, Willamette Valley Communications Center (WVCC), Frontier, Verizon, Oregon Statewide Interoperability Coordinator (SWIC), Service Master of Salem, Pacific Gas and Electric Company (PGE).
- Energy: Pacific Gas and Electric.
- Transportation: City of Salem, City of Woodburn, Marion County Public Works, Marion County Sheriff's Office, ODOT, Salem Public Works, Salem-Keizer School District, Salem-Keizer Transit, Woodburn Transit Service.
- Water: City of Stayton, City of Salem, City of Keizer, City of Turner, Marion County, North Santiam Watershed Council.

## **About the Community Service Center**

The Community Service Center (CSC), a research center affiliated with the Department 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 CSC 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 Community Service Center at the University of Oregon, the OPDR employs a service-learning model to increase community capacity and enhance disaster safety and resilience statewide.

## **Plan Template Disclaimer**

This Hazard Mitigation Plan 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 Marion County in the plan template.





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# APPENDIX A-1:

## PRIORITY ACTION ITEMS

The following list presents the priority mitigation actions for Marion County. The action item forms that follow present specific information for each priority action item.

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. For a more strategic approach, Marion County is listing a set of high priority actions in an effort to focus attention on an achievable set of high leverage activities over the next five-years. Detailed implementation information for each priority action is listed in Appendix A-1. A pool of additional action items is presented in Appendix A-2. This plan identifies priority actions based on an evaluation of high impact hazards, resource availability, and FEMA identified best practices.

- **Multi-Hazard # 1:** Complete a disaster recovery plan for Marion County.
- **Multi-Hazard # 2:** Develop a community education program such as an all hazard community outreach forum.
- **Multi-Hazard # 3:** Conduct an assessment of the short and long term needs for sheltering access and functional needs populations for all hazards.
- **Earthquake # 3:** Create a bridge prioritization inventory based on major lifeline routes including state highways, routes, and major road arteries before July 1, 2017.
- **Earthquake # 5:** Collaborate with SEDCOR to develop relevant public-private partnerships with businesses that can contribute to mitigation, response, and recovery.
- **Drought # 6:** Monitor economic impacts on recreation, tourism and agriculture communities.
- **Flood #6:** Develop a program that maps and communicates real-time flood related road closures.
- **Windstorm # 1:** Initiate a comprehensive program to reduce or eliminate tree hazards to all critical utilities in Marion County. This program includes a prioritization of critical facilities, an assessment of potential tree hazards, and a program to trim, and/or remove tree hazards in designated critical areas.

In addition to the hazard specific priority actions listed above, the lifeline sector groups identified the following priorities. The priority actions are organized by lifeline sector.

### Communications

- **Joint Utility Liaison:** Establish a position responsible for coordinating information sharing across sector service providers. NOTE: this position could also link to or coordinate activities in other critical infrastructure sectors.

- **Special Communication District:** Create a special district to generate revenue for ongoing system maintenance, equipment modernization and hazard mitigation activities.

#### Transportation

- **Integrate Lifeline Corridor Inventories into Transportation System Plans:** TSP's in Marion County do not currently include inventories of lifeline transportation corridors. From a plan integration standpoint this is a missed opportunity, with benefits far outweighing cost.
- **Identify and Designate Priority Transportation Routes:** Develop a "hub and spoke" approach to priority route planning focused on post-event resource collection and distribution.

#### Water

- **Complete and Implement Drought Contingency Plan:** Ensuring success of this ongoing effort related to water quantity is the top water sector priority.
- **Add Risk Assessment and Hazard Mitigation Information to Water Master Plans:** Water Master Plans in Marion County do not do a good job of integrating hazard and system vulnerability information. From a plan integration standpoint this is a missed opportunity, with benefits that outweigh cost.

#### Energy

- **Develop and maintain a "No Disconnect" list:** Protect energy dependent vulnerable populations from service disruption as a result of inability to pay for service.
- **Compare, Crosswalk and Maintain Critical Facilities Lists:** Increase collaboration and common operating framework between energy utilities, emergency management, and end-users by sharing and aligning critical facilities lists.

<b>Marion County Priority Action #1 (Multi-Hazard)</b>		<b>Alignment with Plan Goals:</b>	
Complete a disaster recovery plan for Marion County.		This action aligns with Goals 2, 3, 5, 7, 10	
<b>Alignment with Existing Plans/Policies:</b>			
County NHMP, Comprehensive Plan, Functional Plans, Infrastructure Plans, Emergency Operations Plan			
<b>Rationale for Proposed Action Item:</b>			
Marion County does not currently have a post-disaster recovery plan in place.			
<b>Ideas for Implementation:</b>			
<b>Coordinating Organization:</b>		Marion County Emergency Management	
<b>Internal Partners:</b>		<b>External Partners:</b>	
All county departments		OEM, DLCDD, Business Oregon, SEDCOR, etc.	
<b>Potential Funding Sources:</b>		<b>Estimated cost:</b>	<b>Timeline:</b>
Department of Homeland Security		To be determined (\$50 - \$100K)	<input type="checkbox"/> Ongoing <input type="checkbox"/> Short Term (0-2 years) <input checked="" type="checkbox"/> Mid-Term (2-5 years) <input type="checkbox"/> Long-Term (5+ years)
<b>Action Item Status:</b>		New; Added in 2016	

<b>Marion County Priority Action #2 (Multi-Hazard)</b>		<b>Alignment with Plan Goals:</b>	
Develop a community education program such as an all hazard community outreach forum.		This action aligns with Goals 1, 2, 3, 5	
<b>Alignment with Existing Plans/Policies:</b>			
Emergency Operations Plan			
<b>Rationale for Proposed Action Item:</b>			
Engaging members of the public is critical to success.			
<b>Ideas for Implementation:</b>			
Build on the successful collaboration with SEDCOR to host events targeted at the Whole Community.			
<b>Coordinating Organization:</b>		Marion County Emergency Management	
<b>Internal Partners:</b>		<b>External Partners:</b>	
TBD		DOGAMI, OEM, DCLD; SEDCOR	
<b>Potential Funding Sources:</b>		<b>Estimated cost:</b>	<b>Timeline:</b>
Existing County General Fund and EMPG Grant funds for County Emergency Manager; private fundraising		Cost will depend on the size, scale, duration and number of events. Generally speaking, cost expected to be low.	<input type="checkbox"/> Ongoing <input checked="" type="checkbox"/> Short Term (1-4 years) <input type="checkbox"/> Mid-Term (4-10 years) <input type="checkbox"/> Long-Term (10+ years)
<b>Action Item Status:</b>		New; Added in 2016.	

<b>Marion County Priority Action #3 (Multi-Hazard)</b>		<b>Alignment with Plan Goals:</b>	
Conduct an assessment of the short and long term needs for sheltering access and functional needs populations for all hazards.		This action aligns with Goals 1, 2, 3, 5, 7, 9, 10	
<b>Alignment with Existing Plans/Policies:</b>			
Marion County EOP			
<b>Rationale for Proposed Action Item:</b>			
Marion County has been conducting an ongoing effort to address functional needs populations. This action acknowledges the success of that work and acknowledges that additional effort is needed. Functional needs populations are an identified priority for the county.			
<b>Ideas for Implementation:</b>			
Interviews, focus groups and data analysis.			
<b>Coordinating Organization:</b>		Marion County Emergency Management	
<b>Internal Partners:</b>		<b>External Partners:</b>	
Marion County Planning and Development		Oregon HHS	
<b>Potential Funding Sources:</b>		<b>Estimated cost:</b>	<b>Timeline:</b>
General Fund, AmeriCorps		TBA	<input type="checkbox"/> Ongoing <input checked="" type="checkbox"/> Short Term (0-2 years) <input type="checkbox"/> Mid-Term (2-5 years) <input type="checkbox"/> Long-Term (5+ years)
<b>Action Item Status:</b>		New; Added in 2016.	



<b>Marion County Priority Action #4 (Earthquake)</b>		<b>Alignment with Plan Goals:</b>	
Create a bridge prioritization inventory based on major lifeline routes including state highways, routes, and major road arteries before July 1, 2017.		This action aligns with Goals 2, 3, 4, 5, 7, 8, 10, 11	
<b>Alignment with Existing Plans/Policies:</b>			
Marion County EOP, TSP			
<b>Rationale for Proposed Action Item:</b>			
Marion county does not currently have a bridge prioritization list that is tied to major lifeline routes.			
<b>Ideas for Implementation:</b>			
Work with Transportation lifeline sector representatives to identify the lifeline routes. Establish bridge prioritization list based on those routes.			
<b>Coordinating Organization:</b>		Marion County GIS	
<b>Internal Partners:</b>		<b>External Partners:</b>	
Marion County Emergency Management, DOT		ODOT	
<b>Potential Funding Sources:</b>		<b>Estimated cost:</b>	<b>Timeline:</b>
General fund		Under \$10,000	<input type="checkbox"/> Ongoing <input checked="" type="checkbox"/> Short Term (0-2 years) <input type="checkbox"/> Mid-Term (2-5 years) <input type="checkbox"/> Long-Term (5+ years)
<b>Action Item Status:</b>	New; Added in 2016.		

<b>Marion County Priority Action #5 (Earthquake)</b>		<b>Alignment with Plan Goals:</b>	
Collaborate with SEDCOR to develop relevant public-private partnerships with businesses that can contribute to mitigation, response, and recovery.		This action aligns with Goals 1, 2, 3, 4, 5, 7, 8, 10	
<b>Alignment with Existing Plans/Policies:</b>			
Community Economic Development Strategy			
<b>Rationale for Proposed Action Item:</b>			
Government cannot do everything. Engaging the private sector is critical to success.			
<b>Ideas for Implementation:</b>			
Continue the innovative and successful collaboration with SEDCOR to engage local business.			
<b>Coordinating Organization:</b>		Marion County Emergency Management	
<b>Internal Partners:</b>		<b>External Partners:</b>	
Economic Development		SEDCOR, Regional Solutions, Mid-Willamette Valley Council of Governments, UO Economic Development Administration University Center	
<b>Potential Funding Sources:</b>		<b>Estimated cost:</b>	<b>Timeline:</b>
Economic Development Administration, Hazard Mitigation Grant Program, General Fund, Business Oregon		TBA	<input type="checkbox"/> Ongoing <input type="checkbox"/> Short Term (0-2 years) <input checked="" type="checkbox"/> Mid-Term (2-5 years) <input type="checkbox"/> Long-Term (5+ years)
<b>Action Item Status:</b>	New; Added in 2016.		

<b>Marion County Priority Action #6 (Drought)</b>		<b>Alignment with Plan Goals:</b>	
Monitor economic impacts on recreation, tourism and agriculture communities.		This action aligns with Goals 1, 2, 5	
<b>Alignment with Existing Plans/Policies:</b>			
Community Economic Development Strategy			
<b>Rationale for Proposed Action Item:</b>			
Marion county depends on recreation, agriculture and tourism. Each of these sectors is vulnerable to drought impacts.			
<b>Ideas for Implementation:</b>		<b>Actions Status</b>	
Surveys, economic data analysis, etc.			
<b>Coordinating Organization:</b>		Marion County	
<b>Internal Partners:</b>		<b>External Partners:</b>	
Economic Development		Mid-Willamette Valley Council of Governments	
<b>Potential Funding Sources:</b>		<b>Estimated cost:</b>	<b>Timeline:</b>
Local funding resources, HMGP.		TBD	<input type="checkbox"/> Ongoing <input type="checkbox"/> Short Term (0-2 years) <input checked="" type="checkbox"/> Mid-Term (2-5 years) <input type="checkbox"/> Long-Term (5+ years)
<b>Action Item Status:</b>		New; Added in 2016	

<b>Marion County Priority Action #7 (Flood)</b>		<b>Alignment with Plan Goals:</b>	
Develop a program that maps and communicates real-time flood related road closures.		This action aligns with Goals 1, 3, 4, 5, 10	
<b>Alignment with Existing Plans/Policies:</b>			
Marion County Emergency Operations Plan			
<b>Rationale for Proposed Action Item:</b>			
Flooding can have significant impacts on the transportation sector. Providing real-time road closure information can prevent loss of life.			
<b>Ideas for Implementation:</b>		<b>Actions Status</b>	
<b>Coordinating Organization:</b>	Marion County GIS		
<b>Internal Partners:</b>		<b>External Partners:</b>	
Marion County DOT		OEM, ODOT, DOGAMI	
<b>Potential Funding Sources:</b>		<b>Estimated cost:</b>	<b>Timeline:</b>
Local Funding Resources		TBD	<input type="checkbox"/> Ongoing <input type="checkbox"/> Short Term (0-2 years) <input checked="" type="checkbox"/> Mid-Term (2-5 years) <input type="checkbox"/> Long-Term (5+ years)
<b>Action Item Status:</b>	New; Added in 2016		

<b>Marion County Priority Action #8 (Windstorm)</b>		<b>Alignment with Plan Goals:</b>	
Initiate a comprehensive program to reduce or eliminate tree hazards to all critical utilities in Marion County. This program includes a prioritization of critical facilities, an assessment of potential tree hazards, and a program to trim, and/or remove tree hazards in designated critical areas.		This action aligns with Goals 1, 3, 4, 5, 6, 10, 11	
<b>Alignment with Existing Plans/Policies:</b>			
<b>Rationale for Proposed Action Item:</b>			
Trees are a significant source of damage during wind events.			
<b>Ideas for Implementation:</b>			
<b>Coordinating Organization:</b>		Marion County Emergency Management	
<b>Internal Partners:</b>		<b>External Partners:</b>	
Marion County Public Works		Utility providers	
<b>Potential Funding Sources:</b>		<b>Estimated cost:</b>	<b>Timeline:</b>
Utility user fees, local funding sources, general fund		Varies	<input checked="" type="checkbox"/> Ongoing <input type="checkbox"/> Short Term (0-2 years) <input type="checkbox"/> Mid-Term (2-5 years) <input type="checkbox"/> Long-Term (5+ years)
<b>Action Item Status:</b>		Ongoing	

<b>Marion County Priority Action #9 (Communication Lifeline)</b>		<b>Alignment with Plan Goals:</b>	
Create and staff a Joint Utility Liaison position.		This action aligns with Goals 1, 2, 3, 4, 5, 10	
<b>Alignment with Existing Plans/Policies:</b>			
<b>Rationale for Proposed Action Item:</b>			
The communication and associated lifeline sectors (e.g. energy) consist of multiple entities. Sharing information between sector stakeholders is critical to ensuring a common understanding, priorities and operational strategy.			
<b>Ideas for Implementation:</b>		<b>Actions Status</b>	
Work with sector stakeholders to create and staff the position.			
<b>Coordinating Organization:</b>	Marion County Emergency Management		
<b>Internal Partners:</b>		<b>External Partners:</b>	
		Sector stakeholders	
<b>Potential Funding Sources:</b>		<b>Estimated cost:</b>	<b>Timeline:</b>
User fees		TBD; depends on structure and where position reports. Could be low if existing resources or FTE are used.	<input type="checkbox"/> Ongoing <input checked="" type="checkbox"/> Short Term (0-2 years) <input type="checkbox"/> Mid-Term (2-5 years) <input type="checkbox"/> Long-Term (5+ years)
<b>Action Item Status:</b>	New; Added 2016		

Marion County Priority Action #10 (Communication Lifeline)		Alignment with Plan Goals:
Create a special communication district		This action aligns with Goals 1, 2, 3, 4, 5, 8, 10
<b>Alignment with Existing Plans/Policies:</b>		
<b>Rationale for Proposed Action Item:</b>		
The communication sector does not have adequate funds for needed equipment upgrades, maintenance, redundancy, and mitigation projects.		
<b>Ideas for Implementation:</b>		<b>Actions Status</b>
Feasibility study; Public opinion survey.		
<b>Coordinating Organization:</b>	Marion County Emergency Management	
<b>Internal Partners:</b>		<b>External Partners:</b>
		Communication stakeholders
<b>Potential Funding Sources:</b>	<b>Estimated cost:</b>	<b>Timeline:</b>
General fund for feasibility study	TBD	<input type="checkbox"/> Ongoing <input type="checkbox"/> Short Term (0-2 years) <input checked="" type="checkbox"/> Mid-Term (2-5 years) <input type="checkbox"/> Long-Term (5+ years)
<b>Action Item Status:</b>	New; Added 2016	

<b>Marion County Priority Action #11 (Transportation Lifeline)</b>		<b>Alignment with Plan Goals:</b>	
Integrate Lifeline Corridor Inventories into Transportation System Plans		This action aligns with Goals 1, 2, 3, 4, 5, 7, 8, 10	
<b>Alignment with Existing Plans/Policies:</b>			
Transportation System Plan			
<b>Rationale for Proposed Action Item:</b>			
TSP's in Marion County do not currently include inventories of lifeline transportation corridors. From a plan integration standpoint this is a missed opportunity, with benefits far outweighing cost.			
<b>Ideas for Implementation:</b>		<b>Actions Status</b>	
Update TSP			
<b>Coordinating Organization:</b>	Marion County DOT		
<b>Internal Partners:</b>		<b>External Partners:</b>	
Marion County Emergency Management		ODOT	
<b>Potential Funding Sources:</b>	<b>Estimated cost:</b>	<b>Timeline:</b>	
General fund	TBD	<input type="checkbox"/> Ongoing <input type="checkbox"/> Short Term (0-2 years) <input checked="" type="checkbox"/> Mid-Term (2-5 years) <input type="checkbox"/> Long-Term (5+ years)	
<b>Action Item Status:</b>	New; Added 2016		



<b>Marion County Priority Action #12 (Transportation Lifeline)</b>		<b>Alignment with Plan Goals:</b>	
Identify and Designate Priority Transportation Routes		This action aligns with Goals 1, 2, 3, 4, 5, 7, 8, 10	
<b>Alignment with Existing Plans/Policies:</b>			
Transportation System Plan			
<b>Rationale for Proposed Action Item:</b>			
In order to focus limited analysis, assessment and mitigation project resources, the county can designate priority transportation routes. This will ensure that when investments are made, they are prioritized to those routes that will be most important to post event response and recovery efforts.			
<b>Ideas for Implementation:</b>		<b>Actions Status</b>	
Develop a "hub and spoke" approach to priority route planning focused on post-event resource collection and distribution.			
<b>Coordinating Organization:</b>	Marion County DOT		
<b>Internal Partners:</b>		<b>External Partners:</b>	
Marion County Emergency Management		ODOT	
<b>Potential Funding Sources:</b>		<b>Estimated cost:</b>	<b>Timeline:</b>
General fund		TBD	<input type="checkbox"/> Ongoing <input type="checkbox"/> Short Term (0-2 years) <input checked="" type="checkbox"/> Mid-Term (2-5 years) <input type="checkbox"/> Long-Term (5+ years)
<b>Action Item Status:</b>	New; Added 2016		

<b>Marion County Priority Action #13 (Water Lifeline)</b>		<b>Alignment with Plan Goals:</b>	
Complete and Implement the North Santiam Drought Contingency Plan		This action aligns with Goals 1, 2, 3, 4, 5, 7, 8, 10	
<b>Alignment with Existing Plans/Policies:</b>			
Water Master Plans, Comprehensive Plan			
<b>Rationale for Proposed Action Item:</b>			
Water availability is an increasing concern in Marion County. The ongoing water contingency planning effort is an innovative and successful collaboration between numerous local and regional partners. The effort is already resulting in significant mitigation benefits across Marion County.			
<b>Ideas for Implementation:</b>		<b>Actions Status</b>	
Complete, adopt and begin to implement the plan.			
<b>Coordinating Organization:</b>		Santiam Water Control District	
<b>Internal Partners:</b>		<b>External Partners:</b>	
Marion County Emergency Management		San-tiam Water Con-trol Dis-tract, City of Salem, City of Stayton, Linn Soil & Water Conservation District, Marion Soil & Water Conservation District, Norpac Foods, Inc., North Santiam Watershed Council, Oregon Department of Agriculture, Oregon Department of Environmental Quality, Oregon Department of Forestry	
<b>Potential Funding Sources:</b>		<b>Estimated cost:</b>	<b>Timeline:</b>
Bureau of Reclamation		TBD	<input checked="" type="checkbox"/> Ongoing <input type="checkbox"/> Short Term (0-2 years) <input type="checkbox"/> Mid-Term (2-5 years) <input type="checkbox"/> Long-Term (5+ years)
<b>Action Item Status:</b>		New; Added 2016	

<b>Marion County Priority Action #14 (Energy Lifeline)</b>		<b>Alignment with Plan Goals:</b>	
Develop an Energy Assurance Plan for Marion County		This action aligns with Goals 1, 2, 3, 4, 5, 7, 8, 10	
<b>Alignment with Existing Plans/Policies:</b>			
<b>Rationale for Proposed Action Item:</b>			
<b>Ideas for Implementation:</b>		<b>Actions Status</b>	
<b>Coordinating Organization:</b>	Marion County Emergency Management		
<b>Internal Partners:</b>	<b>External Partners:</b>		
	Oregon Office of Energy		
<b>Potential Funding Sources:</b>	<b>Estimated cost:</b>	<b>Timeline:</b>	
Oregon Office of Energy	TBD	<input type="checkbox"/> Ongoing <input type="checkbox"/> Short Term (0-2 years) <input checked="" type="checkbox"/> Mid-Term (2-5 years) <input type="checkbox"/> Long-Term (5+ years)	
<b>Action Item Status:</b>	New; Added 2016		

<b>Marion County Priority Action #15 (Energy Lifeline)</b>		<b>Alignment with Plan Goals:</b>	
Compare, Crosswalk and Maintain Critical Facilities Lists		This action aligns with Goals 1, 2, 3, 4, 5, 7, 8, 10	
<b>Alignment with Existing Plans/Policies:</b>			
Emergency Operations Plan			
<b>Rationale for Proposed Action Item:</b>			
<b>Ideas for Implementation:</b>		<b>Actions Status</b>	
<b>Coordinating Organization:</b>	Marion County Emergency Management		
<b>Internal Partners:</b>		<b>External Partners:</b>	
<b>Potential Funding Sources:</b>	<b>Estimated cost:</b>	<b>Timeline:</b>	
General fund	TBD	<input type="checkbox"/> Ongoing <input type="checkbox"/> Short Term (0-2 years) <input checked="" type="checkbox"/> Mid-Term (2-5 years) <input type="checkbox"/> Long-Term (5+ years)	
<b>Action Item Status:</b>	New; Added 2016		

## **APPENDIX A-2: ACTION ITEM POOL**

This appendix lists the Action Item Pool actions for Marion County and each of the participating jurisdictions. After the current action item pool, for the County and each jurisdiction that previously had a Hazard Mitigation Plan, we include a table with status updates for each of the previous action items.

# Marion County

Table A2-1. Marion County Action Item Pool

**MC-ONGOING-**

Action Item	Proposed Action Title	Coordinating Organization	Partner Organizations	Timeline	Alignment with Plan Goals							
					Public Awareness	Education	Risk Reduction	Funding and Implementation	Partnerships and Coordination	Natural Resource Utilization	Plan Integration	
Dam Safety #1	Prepare evacuation plan and public notification process for dam failures in order of importance before July 1, 2017.	Emergency Management	Public Works, Planning, Local communities in inundation areas, Army Corps of Engineers, Northwest Senior and Disability Services, Fire Districts, Media and PSAPs	Ongoing	X		X					X
Drought #1	Continue outreach with local farmers, ranchers, and organizations including the local Soil and Water Conservation District, Oregon Department of Agriculture, and the USDA to educate them on the Drought Contingency Plan water conservation methods.	Environmental Services	Soil and Water Conservation District, OSU Extension, USDA, Oregon Department of Agriculture	Ongoing, by March 2018		X			X			

Action Item	Proposed Action Title	Coordinating Organization	Partner Organizations	Timeline	Alignment with Plan Goals							
					Public Awareness	Education	Risk Reduction	Funding and Implementation	Partnerships and Coordination	Natural Resource Utilization	Plan Integration	
Drought #2	Participate in the development of the Drought Contingency Plan for the North Santiam water shed.	Emergency Management, North Santiam Water Control District and the City of Salem	Soil and Water Conservation District, USDA, Army Corp Engineers, and Watershed Council	Ongoing due to be complete in the Spring of 2018								X
Drought #3	Partner with EarthWISE and local school districts (Salem, Keizer, Woodburn, and Stayton) to implement water conservation strategies to maximize water use in schools and educate students about water conservation.	Environmental Services	Marion County Schools, Media, EarthWise, and Oregon Green Schools Program	Ongoing (will go into ongoing programs section)		X				X		
Drought #4	Continue implementing the 'Marion County Water Resource Management Plan' (portion of the Marion County Comprehensive Plan), with yearly review scheduled during the third quarter of the fiscal year.	Planning Department	Environmental Services, State Water Resources Department, Watershed Councils, Soil and Water Conservation District, and the Irrigation District	Ongoing (will go into ongoing programs section)			X				X	X

Action Item	Proposed Action Title	Coordinating Organization	Partner Organizations	Timeline	Alignment with Plan Goals						
					Public Awareness	Education	Risk Reduction	Funding and Implementation	Partnerships and Coordination	Natural Resource Utilization	Plan Integration
Earthquake #1	Promote Great Oregon Shakeout Awareness month in February. Participate in activities for schools, business, and industry. Participating with the Mid-Willamette Emergency Communications Collective on initiatives that are focused on household preparedness.	Emergency Management	Public Works, Safety Committee, Marion County Risk, Red Cross, OEM and Media	Ongoing every October	X	X			X		
Earthquake #2	Collaborate with SEDCOR to develop relevant public-private partnerships with businesses that can contribute to response and recovery.	Emergency Management	SEDCOR	Ongoing	X	X	X	X	X		X
Flood #1	Develop strategies with property owners, and promote the purchase of flood insurance with yearly meetings to minimize future losses from repetitive flood loss areas in the second quarter of the fiscal year.	Planning Department	Emergency Management, Environmental Services, Public Works, FEMA, OEM	Ongoing			X				
Landslide #1	Implement LIDAR schedule for ongoing landslide monitoring.	Emergency Management	Public Works, Emergency Management, GIS, DOGAMI	Ongoing	X	X	X				



Action Item	Proposed Action Title	Coordinating Organization	Partner Organizations	Timeline	Alignment with Plan Goals							
					Public Awareness	Education	Risk Reduction	Funding and Implementation	Partnerships and Coordination	Natural Resource Utilization	Plan Integration	
Wildfire #1	Provide immediate warnings to communities about degraded air quality following large-scale fire events, particularly in areas with high concentrations of access and functional needs.	Environmental Health	Emergency Management, Oregon Public Health, Oregon Department of Forestry	Ongoing	X					X		X
Multi-Hazard #1	Conduct an assessment that maps and provides an analysis that will develop plans for county critical infrastructure.	Emergency Management	NGO, Private Partners, ODOT, Utilities,	Ongoing	X		X	X	X			X
Multi-Hazard #2	Expand auxiliary radio capabilities by developing a strategic plan.	Emergency Management	ARES, CERT, Private partners	Ongoing	X		X			X		X

## MC-SHORT TERM-

Action Item	Proposed Action Title	Coordinating Organization	Partner Organizations	Timeline	Alignment with Plan Goals						
					Public Awareness	Education	Risk Reduction	Funding and Implementation	Partnerships and Coordination	Natural Resource Utilization	Plan Integration
Drought #1	Implement Drought Contingency Plan before July 1, 2018.	Emergency Management, North Santiam Water Control District and the City of Salem	Marion County, North Santiam Water Council and participating agencies	Short Term (2 year planning)	X	X	X	X	X	XX	X
Drought #2	Conduct outreach that will educate property owners on the Marion Soil and Water Conservation District's - Landowner Assistance Program. Property owners could receive partial funding for water conservation projects (up to \$7,500).	Marion County Public Works	Emergency Management	Short Term	X	X	X	X			
Earthquake #1	Setup database to list and prioritize SRGP fundable projects.	Emergency Management	Building Division, Planning Department, DOGAMI, FEMA	Short Term			X				

Action Item	Proposed Action Title	Coordinating Organization	Partner Organizations	Timeline	Alignment with Plan Goals							
					Public Awareness	Education	Risk Reduction	Funding and Implementation	Partnerships and Coordination	Natural Resource Utilization	Plan Integration	
Flood #1	Access the feasibility of creating an upstream detention basin projects in the Mill Creek basin.	Public Works Operations	Planning, Environmental Services, Engineering, Army Corps of Engineers	Short Term			X	X				
Flood #2	Develop programs that map and communicate real-time flood related road closures.	Emergency Management	GIS, Public Works Dispatch and Operations	Short Term	X	X	X	X	X			X
Volcanic Eruption #1	Collaborate with USGS-CVO and related agencies to develop standardized ash fall models that are specific to Marion County.	Emergency Management	GIS, DOGAMI, USGS, CVO	Short Term			X		X			X
Wildfire #1	Implement existing action items contained in the 'Action Plan' section of the <i>Marion County Community Wildfire Protection Plan</i> .	Fire Defense Board	Emergency Management, Fire Marshal, Oregon Department of Forestry	Short Term			X	X				X

Action Item	Proposed Action Title	Coordinating Organization	Partner Organizations	Timeline	Alignment with Plan Goals							
					Public Awareness	Education	Risk Reduction	Funding and Implementation	Partnerships and Coordination	Natural Resource Utilization	Plan Integration	
Multi-Hazard #1	Complete a disaster recovery plan for Marion County.	Emergency Management	Whole Community	Short Term	X		X					X
Multi-Hazard #2	Develop a community education program - such as an all hazard community outreach forum.	Emergency Management	Whole Community	Short Term	X	X	X					X
Multi-Hazard #3	Conduct an assessment of the short and long term needs for sheltering access and functional needs populations for all hazards.	Emergency Management	Marion County Public Health, Red Cross, Cities, NGO's, Oregon Public Health	Short Term					X			X
Multi-Hazard #4	Develop the capability to capture and analyze damage assessment data using GIS tools.	Emergency Management	GIS, DOGAMI, Pictometry	Short Term			x		x			x
Multi-Hazard #5	Develop an Energy Assurance Plan.	Emergency Management	Department of Energy, Whole Community	Short Term			X	X	X			X

Action Item	Proposed Action Title	Coordinating Organization	Partner Organizations	Timeline	Alignment with Plan Goals							
					Public Awareness	Education	Risk Reduction	Funding and Implementation	Partnerships and Coordination	Natural Resource Utilization	Plan Integration	
Multi-Hazard #6	Update the (EAS) Emergency Alert System Plan.	Emergency Management	EAS Partners	Short Term	X		X					X
Multi-Hazard #7	Develop all-hazard pre-scripted messaging.	Environmental Services	Media and Emergency Management	Short Term	X	X	X		X			

## MC-LONG TERM-

Action Item	Proposed Action Title	Coordinating Organization	Partner Organizations	Timeline	Alignment with Plan Goals						
					Public Awareness	Education	Risk Reduction	Funding and Implementation	Partnerships and Coordination	Natural Resource Utilization	Plan Integration
Drought #1	Monitor economic impacts on recreation, tourism and agriculture communities.	Emergency Management	Community Services	Long Term	X	X	X	X	X		X
Earthquake #1	Establish and promote voluntary enhanced building code options for earthquakes (e.g. IBHS Fortified for Safer Living) with educational materials and incentives.	Planning	Emergency Management, , and FEMA	Long Term	X	X	X				
Earthquake #2	Create a bridge prioritization inventory based on major lifeline routes including state highways, routes, and major road arteries before July 1, 2017.	Engineering Division	Planning, Emergency Management, ODOT	Long Term			X	X			
Earthquake #3	Identify and catalog unreinforced masonry and other high risk public and commercial buildings across the county.	Emergency Management	County and City Building Officials	Long Term	X	X	X	X	X		X

Action Item	Proposed Action Title	Coordinating Organization	Partner Organizations	Timeline	Alignment with Plan Goals						
					Public Awareness	Education	Risk Reduction	Funding and Implementation	Partnerships and Coordination	Natural Resource Utilization	Plan Integration
Flood #1	Identify flood prone areas and develop storm water plans to target specific drainage areas, which includes the FEMA CRS (Community Rating System), to encourage community floodplain management.	Engineering Division	Operations, USDA, Oregon Department of Agriculture	Long Term			X			X	X
Flood #2	Create partnerships and strategic plans with local stakeholders (North Santiam Watershed Council) to facilitate riparian habitat restoration projects in flooding or erosion prone areas (e.g. Areas subject to reoccurring flood events -Spong's Landing County Park.)	Environmental Services	Marion County Parks Department, Watershed Councils, OSU Extension, Oregon Department of Fish and Wildlife, Oregon Department of Parks and Recreation	Long Term			X		X	X	
Flood #3	Expand Mid-Willamette Valley High Water Watch program to the Pudding Creek Watershed and install sensors and telemetry.	Public Works	Planning, Emergency Management, Oregon Water Resources Department, USGS	Long Term				X		X	

Action Item	Proposed Action Title	Coordinating Organization	Partner Organizations	Timeline	Alignment with Plan Goals						
					Public Awareness	Education	Risk Reduction	Funding and Implementation	Partnerships and Coordination	Natural Resource Utilization	Plan Integration
Landslide #1	Integrate new DOGAMI landslide hazard information into land use zoning/development codes.	Planning	Environmental Services, Engineering, ODOT, DLCD	Long Term			X				
Landslide #2	Repair and mitigate landslide prone areas. (e.g. along the Little North Fork River, and Abiqua Creek.)	Public Works	State and Federal highway administration, private logging companies	Long Term			X	X			X
Windstorm #1	Initiate a comprehensive program to reduce or eliminate tree hazards to all critical utilities in Marion County. This program includes a prioritization of critical facilities, an assessment of potential tree hazards, and a program to trim, and/or remove tree hazards in designated critical areas.	Public Works – Operations and Environmental Services	Planning, Parks Department, Utility Companies	Long Term			X			X	
Multi-Hazard #1	Develop with private partners a critical infrastructure recovery task force that includes the four life lines communication, transportation, energy, and water.	Emergency Management	ODOT, Public Works, Department of Energy, Portland General Electric, etc.	Long Term	X	X	X		X		X





# Aumsville

**Table A2-2. Aumsville Action Item Pool**

Action Item ID	Hazard	Action Item	Coordinating Organization	Partner Organizations	Timeline
<b>Action Item Pool</b>					
<b>Multi-Hazard</b>					
MH-1	Multi-Hazard	Develop memorandum of understanding with the gas station that gives emergency services first access to station's stored fuel.	City Administration		Short-Term
MH-2	Multi-Hazard	Update the City's Emergency Operations Plan. Important components to include are: *A list of vulnerable populations *Fuel management and access plan *Detailed asset inventory	Police Chief and City staff	Marion Co.	Short-Term
MH-3	Multi-Hazard	Identify and purchase materials the City needs to operate successfully in an emergency situation.	City Administration	Police, Fire	Short-Term
MH-4	Multi-Hazard	Develop a communications plan between the City, Police, and Fire. This will include purchasing more radios so all key personnel can be in contact during an emergency.	Public Works	Police, Fire	Short-Term
MH-5	Multi-Hazard	Develop memoranda of understanding with facilities that could function as emergency shelters during a hazard event.	City Administration	Red Cross	Long-Term
MH-6	Multi-Hazard	Update the Aumsville Comprehensive Plan to reflect statewide land use Goal 7 language surrounding natural hazards.	City Administration	Mid-Willamette Valley Council of Governments	Long-Term
MH-7	Multi-Hazard	Include emergency preparedness resources in the City's monthly newsletter.	City Executive Office	Marion Co.	Ongoing
MH-8	Multi-Hazard	Hold an annual preparedness fair.	City Executive Office		Ongoing
MH-9	Multi-Hazard	Participate in Maron County's MORE Agreement.	City Administration	Marion Co.	Ongoing
MH-10	Multi-Hazard	Develop stronger connections with the business community and encourage businesses to develop continuity of operations plans.	City Administration	Businesses	Ongoing
<b>Drought</b>					
DT-1	Drought	Partner with Marion County to support local agencies' training on water conservation measures.	Public Works	Marion Co.	Ongoing
DT-2	Drought	Participate in Marion Co Drought Contingency Plan.	Public Works	Marion Co.	Short-Term/ Ongoing

Source: City of Aumsville HMP Steering Committee, 2016.

**Table A2-2. Aumsville Action Item Pool (Continued)**

Action Item ID	Hazard	Action Item	Coordinating Organization	Partner Organizations	Timeline
<b>Action Item Pool</b>					
<b>Earthquake</b>					
EQ-1	Earthquake	Complete seismic assessment on critical facilities (water tower assessment currently underway). Retrofit facilities based on recommendations of the assessment.	Public Works	City Administration/ City Council	Short-Term
EQ-2	Earthquake	School seismic retrofitting action - need to talk to school district representative.	School District	Business Oregon - IFA	Short-Term
EQ-3	Earthquake	Purchase a 4-wheel drive vehicle that could provide transportation if major access points to the city are not passable.	Public Works	City Council	Short-Term
EQ-4	Earthquake	Consider requiring new city facilities to exceed the minimum structural requirements for seismic loading.	City Council	Marion Co. Building Inspection	Long-Term
EQ-5	Earthquake	Install automatic shut-off valves in all city facilities that use natural gas.	Public Works	City Council	Long-Term
EQ-6	Earthquake	Develop dam inundation maps.	Risk MAP		Long-Term
EQ-7	Earthquake	Encourage residents to prepare and maintain 2-week survival kits.	City Executive Office	Marion Co.	Ongoing
EQ-8	Earthquake	Send city employees to Marion County's ATC 20 training.	City Administration	Marion Co.	Ongoing
<b>Flood</b>					
FL-1	Flood	Develop updated floodplain maps.	Risk MAP		Long-Term
FL-2	Flood	Host an educational event targeted at flood-vulnerable residents that provides information about participating in the National Flood Insurance Program and other flood mitigation activities.	Public Works	City Executive Office	Ongoing
<b>Severe Weather</b>					
SW-1	Severe Storm	Require new development to put power lines underground.	City Administration		Short-Term
SW-2	Severe Storm	Encourage Pacific Power to underground lines as they are able.	City Administration		Ongoing

Source: City of Aumsville HMP Steering Committee, 2016.

# Aurora

**Table A2-3. Aurora Action Item Pool**

Action Item ID	Hazard	Action Item	Coordinating Organization	Partner Organizations	Timeline
<b>Action Item Pool</b>					
<b>Multi-Hazard</b>					
MH-1	Multi-Hazard	Publicize and sign residents up for the reverse 911 system.	Fire District	City of Aurora, N. Marion School District	Short-Term/ Ongoing
MH-2	Multi-Hazard	Publicize/educate residents about signing up for the Aurora Alerts email system/expand to include text and social media.	City Recorder	Administrative Assistant	Short-Term/ Ongoing
MH-3	Multi-Hazard	Expand the emergency communication system to include text and social media.	N. Marion School District		Short-Term
MH-4	Multi-Hazard	Build relationships with sister counties/jurisdictions/districts and create mutual aid agreements.	City Recorder	N. Marion School District	Long-Term/ Ongoing
MH-5	Multi-Hazard	Partner with private sector and create mutual aid agreements.	City Recorder	N. Marion School District	Long-Term/ Ongoing
MH-6	Multi-Hazard	Develop a multi-agency emergency response team for northern Marion Co.	Marion County Emergency Management	N. Marion School District	Short-Term
<b>Drought</b>					
DT-1	Drought	Update the Water Conservation Plan.	Public Works	City Planner	Long-Term
DT-2	Drought	Partner with Marion County to support agencies' determination of locations for additional aquifer studies that might lead to greater water supplies and help determine funding sources for the studies.	City Council	Marion County	Long-Term
<b>Earthquake</b>					
EQ-1	Earthquake	Send city employees to the County's ATC 20 training.	Public Works	City Recorder	Short-Term/ Ongoing
EQ-2	Earthquake	Encourage reduction of nonstructural and structural earthquake hazards in homes, schools, businesses, and government offices through public education.	City Recorder	Administrative Assistant	Ongoing
EQ-3	Earthquake	Seek funding to further assess the 'probability of collapse' for Aurora City Hall.	Public Works	City Recorder	Long-Term
EQ-4	Earthquake	Continue to run earthquake drills.	N. Marion School District		Ongoing
EQ-5	Earthquake	Encourage residents to prepare and maintain 2-week survival kits. Publicize through City newsletter, website, and the resilience and preparedness trainings the School District is creating.	City Recorder/ Administrative Assistant	N. Marion School District	Short-Term/ Ongoing

Source: City of Aurora HMP Steering Committee, 2016.

**Table A2-3. Aurora Action Item Pool (Continued)**

Action Item ID	Hazard	Action Item	Coordinating Organization	Partner Organizations	Timeline
<b>Action Item Pool</b>					
<b>Flood</b>					
FL-1	Flood	Create a Stormwater Master Plan.	Public Works	City Planner	Long-Term
FL-2	Flood	Continue compliance with the National Flood Insurance Program through the enforcement of local floodplain ordinances.	Public Works		Ongoing
FL-3	Flood	Identify strategies for mitigating and/or preventing flooding from impacting the city's wastewater lagoon system.	Public Works		Long-Term/ Ongoing
FL-4	Flood	Work with property owners who regularly experience flooding along the Pudding River to mitigate their risks.	Public Works		Long-Term
<b>Severe Weather</b>					
SW-1	Severe Storm	Educate citizens about ways to weatherize their homes, as well as safe emergency heating equipment.	City Recorder	Administrative Assistant	Short-Term/ Ongoing
SW-2	Windstorm	Support/encourage electrical utilities to use underground construction methods where possible to reduce power outages from windstorms.	Public Works		Ongoing
SW-3	Windstorm	Review code and revise to require new developments to underground utilities if requirement doesn't currently exist.	City Planner	City Recorder	Long-Term
SW-4	Windstorm	Outreach to PGE about undergrounding power lines that run along Grim (serving the School District).	N. Marion School District		Short-Term
<b>Wildfire</b>					
WF-1	Fire	Outreach to residents on the hillside at the end of 4th Street adjacent to Pudding River about performing fuel reduction projects.	Fire District		Short-Term
WF-2	Fire	Check with the fireworks storage facility at the end of Ottaway to make sure they have a safety plan.	Fire District		Short-Term

Source: City of Aurora HMP Steering Committee, 2016.

**Table A2-4. Status Update: Aurora 2009 Action Items**

2009 Action Item ID	2016 Action Item ID	Action Item	Status	Notes
<b>Multi-Hazard</b>				
1	-	Develop a post-disaster redevelopment plan.	Remove	This is not feasible given the City's resources.
2	P-1	Further assess the potential implications of various transportation route closures.	Update language	Change to create and publicize alternative routes in the event of road closure
3	MH-4 MH-5	Establish mutual aid agreements between government agencies and commercial businesses in the event of an emergency (e.g., fuel, heavy equipment, food, etc.)	Done - Update with additional mutual aid agreement actions	MORE (Managing Oregon Resources Efficiently) Intergovernmental Agreement has been signed by Aurora. Should be 2-week kits.
4	EQ-5	Encourage citizens to prepare and maintain 72 hr kits.	Update language	Encourage through the newsletter and city website.  School District is putting together curricula on resilience and preparedness.
<b>Drought</b>				
1	DT-1 FL-1	Implement actions identified in Aurora's Water System Master Plan, and the Water Management and Conservation Plan.	Done - Update to be about Water C	They will be updating the Water Conservation Plan and are working on creating a Stormwater Master Plan.
2	DT-2	Partner with Marion County to support agencies' determination of locations for additional aquifer studies that might lead to greater water supplies and help determine funding sources for the studies.	Ongoing	Not happened yet – they would still like to identify additional water sources. Note: they have brought another well online, but this is for irrigation.

Source: City of Aurora HMP Steering Committee, 2016.

**Table A2-4. Status Update: Aurora 2009 Action Items (Continued)**

2009 Action Item ID	2016 Action Item ID	Action Item	Status	Notes
<b>Earthquake</b>				
1	P-3	Work with the Salem Red Cross to identify shelters within the city.	Update language	The shelter is located at the School District, but they need to identify one in town; they need to partner with the Red Cross and create an MOU to make a shelter official.  This is actually maybe a multi-hazard action
2	EQ-1	Inventory and assess the seismic stability of older buildings in the city.	Update language	Request and participate in an ATC-20 training.
3	EQ-2	Encourage reduction of nonstructural and structural earthquake hazards in homes, schools, businesses, and government offices through public education.	Ongoing	They do articles in the City newsletter (they don't have much on the website yet)
4	EQ-3	Seek funding to further assess the "probability of collapse" for Aurora City Hall.	Ongoing	They are looking for funding to do the assessment  They put in funding to assess City Hall's needs
5	P-2	Seek funding to further assess the "probability of collapse" for North Marion High School.	Ongoing	Application in to the State to do upgrades.
<b>Flood</b>				
1	FL-2	Continue compliance with the National Flood Insurance Program through the enforcement of local floodplain ordinances.	Ongoing	
2	FL-3	Identify strategies for mitigating and/or preventing flooding from impacting the city's wastewater lagoon system.	Ongoing	Public Works had made some progress, but still more to do.
<b>Volcano</b>				
1	-	Partner with the county to identify critical facilities or equipment that can be damaged by ashfall. Develop mitigation activities to prevent damage to these facilities.	Remove	The Steering Committee determined that Volcano was not a hazard worth attention in this plan.
<b>Windstorm</b>				
1	SW-2 SW-3 SW-4	Support/encourage electrical utilities to use underground construction methods where possible to reduce power outages from windstorms.	Update language	
2	P-4 P-5	Ensure that all critical facilities have backup power and/or emergency operations plans to deal with power outages.	Update language	Trying to acquire more generators (and don't buy propane!) for City Hall and 2 wells
<b>Severe Winter Storm</b>				
1	SW-1	Educate citizens about ways to weatherize their homes, as well as safe emergency heating equipment.	Ongoing	Through the City newsletter and website

Source: City of Aurora HMP Steering Committee, 2016.

# Detroit

**Table A2-4. Detroit Action Item Pool**

Action Item ID	Hazard	Action Item	Coordinating Organization	Partner Organizations	Timeline
<b>Action Item Pool</b>					
<b>Earthquake</b>					
EQ-1	Earthquake	Promote Great Oregon Shakeout Awareness month in October. Participate in activities for schools, business, and industry. Participating with the Mid-Willamette Emergency Communications Collective on initiatives that are focused on household preparedness.	Marion County Emergency Management	Public Works, Safety Committee, Marion County Risk, Red Cross, OEM and Media	Ongoing every October
EQ- 2	Earthquake	Collaborate with GROW EDC to develop relevant public-private partnerships with businesses that can contribute to response and recovery. (Multi-Hazard 4)	Detroit , Marion County Emergency Management	GROW EDC	Ongoing
<b>Multi-Hazard</b>					
MH- 1	Multi-Hazard	Develop an Energy Assurance Plan. (Multi-Hazard 2)	Detroit , Marion County Emergency Management	Department of Energy, Whole Community	Ongoing revisions
MH- 2	Multi-Hazard	Incentivize and assist local fueling stations to purchase diesel generators capable of pumping fuel from in-ground storage tanks.	Detroit , Marion County Emergency Management	Public Works	Short Term
MH- 3	Multi-Hazard	Conduct an assessment of the short and long term needs for sheltering access and functional needs populations for all hazards.	Detroit , Marion County Emergency Management	Marion County Public Health, Red Cross, Cities, NGO's, Oregon Public Health	Short Term
MH- 4	Multi-Hazard	Develop a MOU with community fuel stations to utilize fuel resources found in below-ground tanks after a hazard event.	Detroit , Marion County Emergency Management	Santiam Quick Mart, RFPD	Short Term
MH- 5	Multi-Hazard	Establish a Detroit CERT team.	Marion County Emergency Management, Detroit	CERT, Whole Community	Short Term



**Table A2-5. Detroit Action Item Pool (Continued)**

MH- 6	Multi-Hazard	Develop a community education program - such as an all hazard community outreach forum for students and residents.*	Marion County Emergency Management, Detroit	Public Works and Whole Community	Short Term
MH- 7	Multi-Hazard	Expand auxiliary radio capabilities by developing a team of HAM Radio operators for EMS and interested public.	Marion County Emergency Management, Detroit	ARES, CERT, Private partners, Whole Community	Short Term
<b>Drought</b>					
DT- 1	Drought	Monitor economic impacts on recreation, tourism and agriculture communities.	Detroit, Marion County Emergency Management	Community Services	Long Term
DT- 2	Drought	Collaborate with NSWC to complete WMCP's and improve community understanding of water usage and opportunities to increase efficiencies.**	NSWC, Detroit	North Santiam Watershed DCP Partners	Long Term
DT- 3	Drought	Collaborate with Detroit Lake Recreation Area Business Association (DLRABA) to create a Detroit Lake Master Recreation Plan focused on economic drought resiliency.**	Detroit, DLRABA	USACE, USFS, Marion County Community Services/Board of Commissioners	Long Term
DT- 4	Drought	Collaborate with local Marina's and DLRABA to excavate marinas and allow for use at low water levels.**	Detroit, Kane's Marina, Detroit Lake Marina, DLRABA	USACE, USFS, Marion County Community Services/Board of Commissioners	Long Term
DT- 5	Drought	Collaborate with Detroit Ranger Station to extend boat ramps that are usable year-round.**	Detroit, Detroit Ranger Station	Marion County Community Services/Board of Commissioners	Long Term
DT- 6	Drought	Conduct leak detection surveys for the water system to increase efficiency and prevent further water loss.**	Detroit, Marion County Public Works	NSWC	Long Term
<b>Multi-Hazard</b>					
MH-8	Multi-Hazard	Designate evacuation routes outside of Hwy 22 for EMS.	Detroit , Marion County Emergency Management	RFPD	Long Term

**Table A2-5. Detroit Action Item Pool (Continued)**

MH-9	Multi-Hazard		Marion County Community Services Department/Board of Commissioners, Detroit	Marion County Emergency Management	Long Term
MH-10	Multi-Hazard	Gather community support for the installation of resilient fiber communication infrastructure throughout the community.***	Detroit	Marion County Community Services Department/Board of Commissioners	Long Term
<b>Wildfire</b>					
WF- 1	Wildfire	Collaborate with Detroit Ranger District, ODF, and BLM to conduct fuel hazard reduction along the Wildland Urban interface and Hwy 22.*	ODF, BLM, Detroit Ranger District, Idanha-Detroit RFD	Marion County Emergency Management	Long Term
WF- 2	Wildfire	Collaborate with ODF and Detroit RFD to develop strategic community fuel breaks.*	ODF, BLM, Detroit Ranger District, Idanha-Detroit RFD	Marion County Emergency Management	Long Term
WF- 3	Wildfire	Collaborate with ODF and Idanha- Detroit RFD on the North Santiam River acres project to develop defensible space.*	ODF, BLM, Detroit Ranger District, Idanha-Detroit RFD	Marion County Emergency Management	Long Term
<b>Landslide</b>					
LS- 1	Landslide	Integrate new DOGAMI landslide hazard information into land use zoning/development codes.	Detroit	Environmental Services, Engineering, ODOT, DLCD	Long Term
<b>Flood</b>					
FL- 1	Flood	Collaborate with Marion County to survey and assess current culvert infrastructure most susceptible to natural hazards	Detroit	Marion County Emergency Management/Public Works	Long Term

# Gates

**Table A2-6. Gates Action Item Pool**

Action Item ID	Hazard	Action Item	Coordinating Organization	Partner Organizations	Timeline
<b>Action Item Pool</b>					
<b>Earthquake</b>					
EQ- 1	Earthquake	Promote Great Oregon Shakeout Awareness month in October. Participate in activities for schools, business, and industry. Participating with the Mid-Willamette Emergency Communications Collective on initiatives that are focused on household preparedness.	Marion County Emergency Management	Public Works, Safety Committee, Marion County Risk, Red Cross, OEM and Media	Ongoing every October
EQ- 2	Earthquake	Collaborate with GROW EDC to develop relevant public-private partnerships with businesses that can contribute to response and recovery. (Multi-Hazard 6-9)	Gates, Marion County Emergency Management	GROW EDC	Ongoing
<b>Multi-Hazard</b>					
MH- 1	Multi-hazard	Develop an Energy Assurance Plan. (Multi-Hazard 2-4)	Gates, Marion County Emergency Management	Department of Energy, Whole Community	Ongoing revisions
MH- 2	Multi-hazard	Conduct an assessment of the short and long term needs for sheltering access and functional needs populations for all hazards.	Gates, Marion County Emergency Management	Marion County Public Health, Red Cross, Cities, NGO's, Oregon Public Health	Short Term
MH- 3	Multi-hazard	Develop a MOU with the Santiam School District to utilize facilities for sheltering residents.	Gates, Marion County Emergency Management	Santiam School District, RFPD	Short Term
MH- 4	Multi-hazard	Develop a MOU with First Student to utilize buses during/after hazard events	Gates, Marion County Emergency Management	First Student	Short Term
MH- 5	Multi-hazard	Develop a MOU with Frank & Ferris Lumber to share fuel resources after a hazard event.	Gates, Marion County Emergency Management	Franks Lumber, RFPD	Short Term

**Table A2-6. Gates Action Item Pool (Continued)**

MH- 6	Multi-hazard	Purchase and store emergency rescue rafts for EMS to allow for the use of the North Santiam River as an emergency transportation option.	Gates, Marion County Emergency Management	RFPD	Short Term
MH- 7	Multi-hazard	Continue to train and expand Gates CERT team.	Marion County Emergency Management, Gates	CERT, Whole Community	Short Term
MH- 8	Multi-hazard	Develop a community education program - such as an all hazard community outreach forum for students and residents.*	Marion County Emergency Management, Gates	Public Works Whole Community	Short Term
MH- 9	Multi-hazard	Expand auxiliary radio capabilities by developing a team of HAM Radio operators for EMS and interested public.	Marion County Emergency Management, Gates	ARES, CERT, Private partners, Whole Community	Short Term
<b>Drought</b>					
DT- 1	Drought	Monitor economic impacts on recreation, tourism and agriculture communities.	Gates, Marion County Emergency Management	Community Services	Long Term
DT- 2	Drought	Collaborate with NSWC to complete WMCP's and improve community understanding of water usage and opportunities to increase efficiencies.**	NSWC, Gates	North Santiam Watershed DCP Partners	Long Term
<b>Flood</b>					
FL- 1	Flood	Create partnerships and strategic plans with NSWC to conduct leak detection surveys.**	Marion County Environmental Services, Gates	Marion County Parks Department, Oregon Department of Fish and Wildlife	Long Term
FL- 2	Flood	Create partnerships and strategic plans with NSWC to explore alternative water supply sources.**	Marion County Environmental Services, Gates	Marion County Parks Department, Oregon Department of Fish and Wildlife	Long Term
<b>Multi-hazard</b>					

**Table A2-6. Gates Action Item Pool (Continued)**

MH-10	Multi-hazard	Conduct road improvements on Gates Hill Road and Hudel Road as identified in the CWPP*	RFPD, Gates, Marion County Public Works	Marion County Emergency Management	Long Term
MH-11	Multi-hazard	Collaborate with Marion County to connect to a more resilient regional water/sewer system.***	Marion County Community Services Department/Emergency Management, Gates	Marion County Emergency Management	Long Term
MH-12	Multi-hazard	Gather community support for the installation of resilient fiber communication infrastructure throughout the community.***	Gates	Marion County Community Services Department/Board of Commissioners	Long Term
<b>Wildfire</b>					
WF- 1	Wildfire	Collaborate with Detroit Ranger District, ODF, and BLM to conduct fuel hazard reduction along the Wildland Urban interface.*	ODF, BLM, Detroit Ranger District	Marion County Emergency Management	Long Term
<b>Landslide</b>					
LS- 1	Landslide	Integrate new DOGAMI landslide hazard information into land use zoning/development codes.	Gates	Environmental Services, Engineering, ODOT, DLCD	Long Term

# Idanha

**Table A2-7. Idanha Action Item Pool**

Action Item ID	Hazard	Action Item	Coordinating Organization	Partner Organizations	Timeline
<b>Action Item Pool</b>					
<b>Earthquake</b>					
EQ- 1	Earthquake	Promote Great Oregon Shakeout Awareness month in October. Participate in activities for schools, business, and industry. Participating with the Mid-Willamette Emergency Communications Collective on initiatives that are focused on household preparedness.	Marion County Emergency Management	Public Works, Safety Committee, Marion County Risk, Red Cross, OEM and Media	Ongoing every October
EQ- 2	Earthquake	Collaborate with GROW EDC to develop relevant public-private partnerships with businesses that can contribute to response and recovery. (Multi-Hazard 4)	Idanha, Marion County Emergency Management	GROW EDC	Ongoing
<b>Multi-Hazard</b>					
MH- 1	Multi-Hazard	Develop an Energy Assurance Plan.	Marion County Emergency Management	Mill City, Department of Energy, Whole Community	Ongoing revisions
MH- 2	Multi-Hazard	Conduct an assessment of the short and long term needs for sheltering access and functional needs populations for all hazards.	Idanha, Marion County Emergency Management	Marion County Public Health, Red Cross, Cities, NGO's, Oregon Public Health	Short Term
MH- 3	Multi-Hazard	Establish a strategic plan to utilize community resident amenities.	Idanha	Marion County Emergency Management	Short Term
MH- 4	Multi-Hazard	(Hill brothers) – Kubota Tractor, Skidder			

**Table A2-7. Idanha Action Item Pool (Continued)**

MH- 5	Multi-Hazard	Establish an Idanha CERT team.	Marion County Emergency Management, Idanha	CERT, Whole Community	Short Term
MH- 6	Multi-Hazard	Expand auxiliary radio capabilities by developing a team of HAM Radio operators for EMS and interested public.	Marion County Emergency Management, Idanha	ARES, CERT, Private partners, Whole Community	Short Term
<b>Drought</b>					
DT- 1	Drought	Monitor economic impacts on recreation, tourism and agriculture communities.	Idanha, Marion County Emergency Management	Community Services	Long Term
DT- 2	Drought	Collaborate with NSWC to complete WMCP's and improve community understanding of water usage and opportunities to increase efficiencies.**	NSWC, Idanha	North Santiam Watershed DCP Partners	Long Term
DT- 3	Drought	Conduct leak detection surveys for the water system to increase efficiency and prevent further water loss.**	Idanha, Marion County Public Works	NSWC	Long Term
DT- 4	Drought	Develop water storage tanks to hold treated water for municipal use.	Idanha, Marion County Public Works	NSWC, Marion County Emergency Management	Long Term
<b>Multi-Hazard</b>					
MH- 7	Multi-Hazard	Collaborate with local residents and NSWC to mitigate risks from the Idanha revetment/floodplain project.	Idanha, NSWC	USFS, FEMA, NRCS, Marion County Emergency Management	Long Term

**Table A2-7. Idanha Action Item Pool (Continued)**

MH- 8	Multi-Hazard	Conduct a fatigue test on Church St. bridge to ensure its structural integrity in case of a hazard event	Idanha, Marion County Public Works	Marion County Emergency Management	Long Term
MH- 9	Multi-Hazard	Designate evacuation routes outside of Hwy 22 for EMS.	Idanha, Marion County Emergency Management	RFPD	Long Term
MH- 10	Multi-Hazard	Collaborate with Marion County to connect to a more resilient regional water/sewer system.***	Marion County Community Services Department/Board of Commissioners, Idanha	Marion County Emergency Management	Long Term
MH- 11	Multi-Hazard	Gather community support for the installation of resilient fiber communication infrastructure throughout the community.***	Idanha	Marion County Community Services Department/Board of Commissioners	Long Term
<b>Wildfire</b>					
WF- 1	Wildfire	Collaborate with Detroit Ranger District, ODF, and BLM to conduct fuel hazard reduction along the Wildland Urban interface and Hwy 22.*	ODF, BLM, Idanha Ranger District, Idanha RFD	Marion County Emergency Management	Long Term
WF- 2	Wildfire	Collaborate with ODF and Idanha-Detroit RFD to develop strategic community fuel breaks.*	ODF, BLM, Idanha Ranger District, Idanha-Detroit RFD	Marion County Emergency Management	Long Term
<b>Landslide</b>					
LS- 1	Landslide	Integrate new DOGAMI landslide hazard information into land use zoning/development codes.	Idanha	Environmental Services, Engineering, ODOT, DLCD	Long Term
<b>Flood</b>					



**Table A2-7. Idanha Action Item Pool (Continued)**

FL- 1	Flood	Widen the North Santiam River and reassess the dike and jetty to minimize flooding within the North Santiam River Project	Idanha, NSWC	Marion County Emergency Management	Long Term
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# Keizer

**Table A2-8. Keizer Action Item Pool**

Action Item ID	Hazard	Action Item	Coordinating Organization	Partner Organizations	Timeline
<b>Action Item Pool</b>					
<b>Multi-Hazard</b>					
MH-1	Multi-Hazard	Create an emergency preparedness section on the City's website. Populate with resources and publicize.	Keizer Administration	Marion Co.	Ongoing
MH-2	Multi-Hazard	Maintain a regular presence at outreach events, especially neighborhood association events, and provide the public with preparedness resources.	Keizer Emergency Management	Marion Co., CERT	Ongoing
MH-3	Multi-Hazard	Make guest appearance on local radio shows to provide announcements and resources for preparedness.	Keizer Emergency Management	Marion Co., CERT	Ongoing
MH-4	Multi-Hazard	Add hazard awareness material into existing environmental education currently done in schools.	City of Keizer	Marion Co., CERT	Ongoing
MH-5	Multi-Hazard	Join Marion County's Everbridge communication system.	City emergency responders	Marion Co., CERT	Short Term (1-2 years)
MH-6	Multi-Hazard	Encourage residents to participate in Everbridge.	Keizer Emergency Management	City Council	Mid Term (3-5 years)
MH-7	Multi-Hazard	Meet with the City of Salem to discuss the Willow Lake Waste Water Treatment Plant: *How it can be reinforced to minimize damage in a hazard event. *How hazardous materials can be secured or removed to prevent groundwater contamination	City of Keizer Public Works	City of Salem	Short Term (1-2 years)
MH-8	Multi-Hazard	Further develop risk assessment maps to show areas at risk for all hazards.	FEMA Risk MAP	DOGAMI, DLCD	Short Term (1-2 years)
MH-9	Multi-Hazard	Develop mutual aid agreements with surrounding counties.	City Administration	Emergency Manager, Public Works	Short Term (1-2 years)
MH-10	Multi-Hazard	Expand on the information gathered for the internal public works operational manual to create a full registry of populations that may need particular assistance in an emergency situation.	Public Works	Emergency Manager	Mid Term (3-5 years)
MH-11	Multi-Hazard	Update the Continuity of Operations Plan.	Keizer Emergency Management	Marion Co.	Short Term (1-2 years)
MH-12	Multi-Hazard	Participate in Marion County's post-disaster recovery planning efforts.	City Administration	Marion Co.	Mid Term (3-5 years)
MH-13	Multi-Hazard	Continue development of CERT teams to ease the load on emergency services following a disaster.	Keizer Emergency Management	CERT	Ongoing
MH-14	Multi-Hazard	Develop memoranda of understanding with appropriate facilities specifying that they will function as emergency shelters during disruptive events with support from the City.	Keizer Emergency Management	Red Cross	Short Term (1-2 years)
MH-15	Multi-Hazard	Educate businesses and governmental organizations about the importance of developing continuity of operations plans.	Environmental	Marion Co.	Ongoing
MH-16	Multi-Hazard	Update the Keizer Comprehensive Plan to reflect statewide land use Goal 7 language surrounding natural hazards.	Planning	DLCD	Mid Term (3-5 years)

Source: City of Keizer HMP Steering Committee, 2016.

**Table A2-8. Keizer Action Item Pool (Continued)**

Action Item ID	Hazard	Action Item	Coordinating Organization	Partner Organizations	Timeline
<b>Action Item Pool</b>					
<b>Earthquake</b>					
EQ-1	Earthquake	Participate in the Great Shakeout each year.	City Administration	OEM	Ongoing
EQ-2	Earthquake	School seismic retrofitting action - need to talk to school district representative.	School District	Business Oregon - IFA	Short Term (1-2 years)
EQ-3	Earthquake	Send city employees to the County's ATC 20 training.	Public Works	City Administration, Emergency Management	Ongoing
EQ-4	Earthquake	Perform a seismic analysis of box culverts in Keizer and repair or upgrade as resources become available.	City of Keizer Public Works	Marion Co. DOT	Mid Term (3-5 years)
EQ-5	Earthquake	Encourage residents to prepare and maintain 2-week survival kits.	Keizer Emergency Management	CERT	Ongoing
<b>Flood</b>					
FL-1	Flood	Continue compliance with the National Flood Insurance Program through the enforcement of local floodplain ordinances. Update enforcement based on changes to the NFIP (such as flood elevation level changes).	Planning	DLCD	Ongoing
FL-2	Flood	Improve water quality and water flow through wetland vegetation restoration and stream cleanup, especially along Claggett Creek.	Environmental	Salem-Keizer Urban Watershed Councils, Association	Ongoing
FL-3	Flood	Educate residents and business owners near Labish and Claggett creeks about how to manage flood risks.	Environmental	Salem-Keizer Urban Watershed Councils, Association	Ongoing
<b>Wind Storm</b>					
WS-1	Wind Storm	Educate the public about windstorm-resistant trees and landscaping practices and the role of proper tree pruning and care in preventing damage during windstorms.	Environmental	OSU Extension	Ongoing
WS-2	Wind Storm	Ensure that all critical facilities have backup power and/or emergency operations plans to deal with power outages.	City Administration	Emergency Management	Ongoing
WS-3	Wind Storm	Record instances of infrastructure failure and notify PGE of infrastructure that regularly fails.	Emergency Management	PGE	Ongoing

Source: City of Keizer HMP Steering Committee, 2016.

**Table A2-9. Status Update: Keizer 2009 Action Items**

2009 Action Item ID	2016 Action Item ID	Action Item	Status	Notes
<b>Multi-hazard</b>				
1	MH-8	Further develop risk assessment maps to show areas at risk for all hazards.	Ongoing	Ongoing as part of the Risk MAP process.
2	MH-9	Establish mutual aid agreements between government agencies and commercial businesses in the event of an emergency (e.g. fuel, heavy equipment, food, etc).	Done - Update with additional mutual aid agreement actions	MORE (Managing Oregon Resources Efficiently) Intergovernmental Agreement has been signed by Keizer.
3	MH-10	Develop a registry of populations that may need particular assistance in an emergency situation.	Update language	Add more information to the maps and lists they just made for the internal public works operational manual.
4	EQ-5	Encourage citizens to prepare and maintain 72-hour kits.	Update language	Should be 2 week kits.
5	MH-12	Develop a post-disaster redevelopment plan.	Update language	Participate with Marion Co in developing a post-disaster recovery plan.
6	MH-13	Continue development of CERT teams to ease the load on emergency services following a disaster.	Ongoing	
7	MH-14	Develop and equip emergency shelters to take care of residents and vulnerable populations such as the elderly, the very young, or visitors.	Update language	Revise: MOUs with facilities that could function as an emergency shelter – Emergency Management lead
8	MH-15	Educate businesses and governmental organizations about the importance of developing continuity of operations plans.	Ongoing	Environmental in charge. Work with Marion County to roll this out.
9	-	Further assess the potential implications of various transportation route closures.	Remove	This will happen as part of the emergency operations plan.
<b>Drought</b>				
1	-	Review and update Keizer’s water management plan to include new information and revisit emergency water agreements with the city of Salem.	Done – agreements revised and adopted	They have water curtailment as part of a City ordinance and the Water Management Plan

Source: City of Keizer HMP Steering Committee, 2016.

**Table A2-9. Status Update: Keizer 2009 Action Items (Continued)**

2009 Action Item ID	2016 Action Item ID	Action Item	Status	Notes
<b>Earthquake</b>				
1	EQ-1 MH-1, 2, 3, & 4	Encourage reduction of nonstructural and structural earthquake hazards in homes, schools, businesses, and government offices through public education.	Update language	There are "Living on Shaky Ground" publications at City Hall. The schools have an earthquake plan. They participate in the Great Shakeout each year.
2	EQ-2	Seek funding to further assess the "probability of collapse" for Cummings Elementary, Gubser Elementary, Kennedy Elementary, and McNary High School and structurally reinforce vulnerable school buildings to prevent loss of life to students.	Unknown	School district
3	MH-5 MH-6	Work with Marion County to develop emergency procedures and alert systems in the event of a dam breach upstream, along the Detroit and Lookout Point Dams.	Update language	They are not on Everbridge.  New action – Everyone sign up for everbridge system (move to multi-hazard).  New action – Expand everbridge system to include residents.
4	P-1 P-2 P-4 MH-7	Conduct seismic evaluations of critical facilities and infrastructure, including Keizer's Public Works building and water pipes. Encourage and assist the city of Salem to conduct similar evaluations on the Willow Lake Waste Water Treatment Plant.	Ongoing/Update language	They have evaluated reservoirs, but many other things have not been evaluated; they know where steel pipes are (which are most vulnerable).  Shop needs to be evaluated – this is the revised action.  New: Meeting with Salem to come up with a plan for dealing with the impacts to Keizer.
5	MH-1, 2, 3, & 4	Encourage earthquake safety promotion and drills by community groups.	Ongoing/Update language	CERT does this. This action should be wrapped into the other community outreach actions.
6	EQ-3	Train employees in Rapid Visual Assessment (RVA) techniques to conduct building safety evaluations.	Update language	Revised language: ATC20 training that the County puts on

Source: City of Keizer HMP Steering Committee, 2016.

**Table A2-9. Status Update: Keizer 2009 Action Items (Continued)**

2009 Action Item ID	2016 Action Item ID	Action Item	Status	Notes
<b>Flood</b>				
1	MH-7	Encourage the city of Salem to secure or remove hazardous materials at the waste water treatment plant where possible to prevent contamination of groundwater resources.	Update language	This is something else that needs to be discussed
2	-	Explore steps needed to qualify Keizer for participation in the National Flood Insurance Program's (NFIP) Community Rating System (CRS).	Delete	The Steering Committee determined that they did not want to participate in the CRS - it is too cumbersome and they don't have capacity.
3	FL-1	Continue compliance with the National Flood Insurance Program through the enforcement of local floodplain ordinances.	Update language	Add: and stay current and update actions based on changes to the NFIP
4	FL-2	Improve water quality and water flow through wetland vegetation restoration and stream cleanup, especially along Claggett Creek.	Ongoing	Through state and federal permits – Environmental is already doing this.
5	MH-1, 2, 3, & 4	Partner with the county to conduct workshops for target audiences on National Flood Insurance Programs, mitigation activities, and potential assistance from FEMA's Flood Mitigation Assistance and Hazard Mitigation Grant Programs.	Ongoing/Update language	Revise language to be an outreach action similar to earthquake - wrap in with other outreach actions.
<b>Wind storm</b>				
1	WS-1	Educate the public about windstorm-resistant trees and landscaping practices and the role of proper tree pruning and care in preventing damage during windstorms.	Ongoing	Environmental is currently providing education around trees.
2	WS-2	Ensure that all critical facilities have backup power and/or emergency operations plans to deal with power outages.	Ongoing	They have all the necessary critical facilities covered, and they regularly "exercise" them (make sure they work).
<b>Severe winter storm</b>				
1	WS-3	Consider upgrading lines and poles to improve wind/ice loading, and underground critical lines.	Update language	PGE owns the powerlines – they have control. Update to be about alerting PGE of infrastructure that often fails.
2	MH-1, 2, 3, & 4	Educate citizens about ways to weatherize their homes, as well as safe emergency heating equipment.	Ongoing/Update language	Wrap in with the other outreach actions.

Source: City of Keizer HMP Steering Committee, 2016.

# Mill City

**Table A2-10. Mill City Action Item Pool**

Action Item Pool					
Earthquake					
EQ- 1	Earthquake	Promote Great Oregon Shakeout Awareness month in October. Participate in activities for schools, business, and industry. Participating with the Mid-Willamette Emergency Communications Collective on initiatives that are focused on household preparedness.	Marion County Emergency Management	Public Works, Safety Committee, Marion County Risk, Red Cross, OEM and Media	Ongoing every October
EQ- 2	Earthquake	Collaborate with GROW EDC to develop relevant public-private partnerships with businesses that can contribute to response and recovery. (Multi-Hazard 6-9)	Marion County Emergency Management	Mill City, GROW EDC	Ongoing
Multi-Hazard					
MH- 1	Multi-Hazard	Develop an Energy Assurance Plan. (Multi-Hazard 2-4)	Marion County Emergency Management	Mill City, Department of Energy, Whole Community	Ongoing revisions
MH- 2	Multi-Hazard	Evaluate the diesel generation power needed for critical city facilities. Acquire a backup diesel generator, capable of powering city facilities for a minimum of 3 days with private, state, and federal resources.	Marion County Emergency Management, Mill City,	Mill City Public Works	Short Term
MH- 3	Multi-Hazard	Develop diesel storage near Kingwood Wells #1 & #2 to support the generator for a minimum of 3 days.	Marion County Emergency Management, Mill City,	Marion County Public Works	Short Term
MH- 4	Multi-Hazard	Incentivize and assist local fueling stations to purchase diesel generators capable of pumping fuel from in-ground storage tanks.	Marion County Emergency Management	Mill City,	Short Term
MH- 5	Multi-Hazard	Conduct an assessment of the short and long term needs for sheltering access and functional needs populations for all hazards.	Mill City, Marion County Emergency Management	Marion County Public Health, Red Cross, Cities, NGO's, Oregon Public Health	Short Term

**Table A2-10. Mill City Action Item Pool (Continued)**

MH- 6	Multi-Hazard	Develop a MOU with the Santiam School District to utilize facilities for sheltering residents.	Mill City, and Marion County Emergency Management	Santiam Canyon School District, Mill City RFPD, City of Mill City and Linn County Sheriff's Office, Red Cross	Short Term
MH- 7	Multi-Hazard	Develop a MOU with First Student to utilize buses during/after hazard events	Mill City, and Marion County Emergency Management	Santiam Canyon School District, Linn County Sheriff's Office, City of Mill City and First Student	Short Term
MH- 8	Multi-Hazard	Develop a MOU with Frank Lumber Company & Freres Lumber to share fuel resources after a hazard event.	Mill City, and Marion County Emergency Management	Linn County Sheriff's Office, Frank Lumber Co., Freres Lumber, Mill City RFPD, City of Mill City	Short Term
MH- 9	Multi-Hazard	Develop a MOU with community fuel stations to utilize fuel resources found in below-ground tanks after a hazard event.	Mill City, and Marion County Emergency Management	Santiam Quick Mart, Mill City RFPD, Linn County Sheriff's Office and City of Mill City	Short Term
MH- 10	Multi-Hazard	Establish a Mill City CERT team.	Mill City, and Marion County Emergency Management	Mill City, Marion County Emergency Management, CERT,	Short Term
MH- 11	Multi-Hazard	Develop a community education program - such as an all hazard community outreach forum for students and residents.*	Mill City, and Marion County Emergency Management	Linn County Sheriff's Office, Whole Community	Short Term
MH- 12	Multi-Hazard	Expand auxiliary radio capabilities by developing a team of HAM Radio operators for EMS and interested public.	Marion County Emergency Management, Linn County Sheriff's Office	ARES, CERT, Private partners, Whole Community	Short Term



**Table A2-10. Mill City Action Item Pool (Continued)**

<b>Drought</b>					
DT- 1	Drought	Monitor economic impacts on recreation, tourism and agriculture communities.	Mill City, and Marion County Emergency Management	GROW EDC, Community Services	Long Term
DT- 2	Drought	Collaborate with NSWC to complete WMCP's and improve community understanding of water usage and opportunities to increase efficiencies.**	NSWC, Mill City	North Santiam Watershed DCP Partners	Long Term
<b>Flood</b>					
FL- 1	Flood	Create partnerships and strategic plans with NSWC to facilitate riparian habitat restoration projects in flooding or erosion prone areas (e.g. Areas subject to reoccurring flood events –Elizabeth, Cedar, DeFord, and Snake Creeks.)**	Marion County Environmental Services, NSWC	Mill City , Marion County Parks Department, Oregon Department of Fish and Wildlife,	Long Term
<b>Multi-Hazard</b>					
MH- 13	Multi-Hazard	Repair retaining wall on North Santiam River bank and develop recreational access dock to leverage retaining wall repair costs.**	Mill City , Marion County Emergency Management/Community Services Department	Marion County Board of Commissioners, Marine Board, DSL, Oregon River Experiences,	Long Term
MH- 14	Multi-Hazard	Designate evacuation routes outside of Hwy 22 for EMS.	Marion County Public Works, Linn County Public Works	RFPD, Mill City, Marion County Emergency Management	Long Term
MH- 15	Multi-Hazard	Collaborate with Marion County to connect to a more resilient regional water/sewer system.***	Marion County Community Services Department/Board of Commissioners, Mill City	Marion County Emergency Management	Long Term

**Table A2-10. Mill City Action Item Pool (Continued)**

MH- 16	Multi-Hazard	Gather community support for the installation of resilient fiber communication infrastructure throughout the community.***	Marion County Community Services Department/Board of Commissioners	Mill City	Long Term
<b>Wildfire</b>					
WF- 1	Wildfire	Collaborate with Detroit Ranger District, ODF, and BLM to conduct fuel hazard reduction along the Wildland Urban interface.*	ODF, BLM, Detroit Ranger District	Marion County Emergency Management	Long Term
WF- 2	Wildfire	Collaborate with ODF and Mill City RFD to develop strategic community fuel breaks along Hwy 22, Sitcom road, and Bud Long.*	ODF, BLM, Detroit Ranger District	Marion County Emergency Management	Long Term
<b>Landslide</b>					
LS- 1	Landslide	Integrate new DOGAMI landslide hazard information into land use zoning/development codes.	Mill City	Environmental Services, Engineering, ODOT, DLCD	Long Term

# Silverton

**Table A2-1 I. Silverton Action Item Pool**

Action Item ID	Hazard	Action Item	Coordinating Organization	Partner Organizations	Timeline
<b>Action Item Pool</b>					
<b>Multi-Hazard</b>					
MH-1	Multi-Hazard	Assess options for a new City Hall building a structure that will withstand flood.	Administrative Services Director	City Council	Mid Term (3-5 years)
MH-2	Multi-Hazard	Create a Facilities Master Plan that assesses the need for new or updated facilities, and incorporates natural hazard vulnerabilities and mitigation measures for reducing vulnerability. Consider hazards in future facilities master plan updates.	Public Works	Administrative Services Director	Mid Term (3-5 years)
MH-3	Multi-Hazard	Create memoranda of understanding with fuel stations that allows emergency responders first access to fuel.	Public Works	Administrative Services Director	Short Term (1-2 years)
MH-4	Multi-Hazard	Create mutual aid agreement with sister cities.	Administrative Services Director	Emergency Management; Marion Co.	Short Term (1-2 years)
MH-5	Multi-Hazard	Educate businesses and governmental organizations about the importance of continuity of operations plans to make them more resilient to natural hazards.	Administrative Services Director	Chamber of Commerce	Ongoing
MH-6	Multi-Hazard	Participate in the COAD.	Emergency Management	Marion Co.; CERT	Ongoing
MH-7	Multi-Hazard	Improve coordination and evaluation of technical and engineering gaps in communications capabilities for natural hazards event response. (METCOM is currently doing an assessment.)	Emergency Management	City Administration; METCOM 911	Short Term (1-2 years)
MH-8	Multi-Hazard	Review, and if necessary, revise emergency management and business continuity plans, policies, and ordinances to ensure effective response, business continuity, and post-disaster recovery efforts. (Next update in 2018.)	Emergency Management	City Administration; City Council	Short Term (1-2 years)
MH-9	Multi-Hazard	Identify larger equipment that needs to be purchased that would support response during a disaster.	Emergency Management	City Administration; City Council	Short Term (1-2 years)
MH-10	Multi-Hazard	Secure memoranda of understanding for alternative sites that could be used for essential city functions if city buildings are not usable.	Administrative Services Director	City Council	Short Term (1-2 years)

Source: City of Silverton HMP Steering Committee, 2016.

**Table A2-I I. Silverton Action Item Pool (Continued)**

Action Item ID	Hazard	Action Item	Coordinating Organization	Partner Organizations	Timeline
<b>Action Item Pool</b>					
<b>Drought</b>					
DR-1	Drought	Participate in implementing the Marion County Drought Contingency Plan	Water Quality Supervisor - Public Works	Marion County; North Santiam Drought Contingency Committee	Ongoing
<b>Earthquake</b>					
EQ-1	Earthquake	Seek voter approval for construction of City of Silverton Police Facility/Emergency Operations Center.	City Manager and Council	Fire Marshal; Police Chief	Mid Term (3-5 years)
EQ-2	Earthquake	Following seismic evaluation of the West C and Main Street over Silver Creek, seek funding to reinforce or replace as needed.	Public Works Director	Marion C.; ODOT	Mid Term (3-5 years)
EQ-3	Earthquake	Assess the seismic strength of Silverton's sewage treatment system and develop improvements accordingly as part of the sewage system's current update efforts.	Public Works Director, Water Quality Supervisor	City Council	Short Term (1-2 years)
EQ-4	Earthquake	Coordinate with Silverton School District to seek funding to assess and seismically retrofit school buildings that are vulnerable to collapse, including Mark Twain Middle School and the Robert Frost Elementary School.	Administrative Services Director	Silverton School District; Business Orgon IFA (seismic grant program); City Council	Mid Term (3-5 years)
EQ-5	Earthquake	Encourage reduction of nonstructural and structural earthquake hazards in homes, schools, businesses, and government offices through public education and the Map My Neighborhood program.	Administrative Services Director	Marion Co.	Short Term (1-2 years)
EQ-6	Earthquake	Update comprehensive plan to reflect the latest information on seismic hazards.	Community Development	Planning Commission; DLCD	Mid Term (3-5 years)
EQ-7	Earthquake	Evaluate the installation of automatic shut-off valves in all city facilities that use natural gas.	Engineering	Northwest Natural	Ongoing
EQ-8	Earthquake	Send city employees to the County's ATC 20 training.	Administrative Services Director	City/County Emergency Management	Ongoing
EQ-9	Earthquake/ Multi-Hazard	Encourage residents to prepare and maintain at minimum two-week survival kits.	Emergency Management	CERT	Ongoing

Source: City of Silverton HMP Steering Committee, 2016.

**Table A2-I I. Silverton Action Item Pool (Continued)**

<b>Flood</b>					
FL-1	Flood	Educate residents and business owners near Silver Creeks about how to manage flood risks.	City floodplain coordinator	DLCD; FEMA; Risk MAP	Ongoing
FL-2	Flood	Mitigate flood issues at the wastewater treatment facility through riverbank reconstruction and other flood mitigation measures.	Public Works Director, Water Quality Supervisor	City Council	Short Term (1-2 years)
FL-3	Flood	Continue compliance with the National Flood Insurance Program (NFIP) through the enforcement of local floodplain ordinances.	City floodplain coordinator	Administrative Services Director	Ongoing
<b>Landslide</b>					
LS-1	Landslide	Based on the new LIDAR information obtained from DOGAMI, create a list of at-risk infrastructure and develop a public infrastructure landslide mitigation program to address the landslide hazard.	Public Works Director	DOGAM; Marion Co.	Short Term (1-2 years)
<b>Severe Winter Storm</b>					
SWS-1	Severe Winter Storm	Continue to educate citizens about ways to weatherize their homes, as well as safe emergency heating equipment. [This could be improved]	Emergency Management	PGE	Ongoing
<b>Wildfire</b>					
WF-1	Wildfire	Implement the wildfire mitigation actions for Silverton found in the Marion County Community Wildfire Protection Plan when an updated plan becomes available.	Fire Marshal	Marion Co.	Ongoing
WF-2	Wildfire	Review Marion County's development codes together with the Marion County Planning Department to develop ways to mitigate wildfires near Silverton.	Fire Marshal	Community Development	Short Term (1-2 years)
<b>Windstorm</b>					
WS-1	Windstorm	Continue to support/encourage electrical utilities to use underground construction methods where possible to reduce power outages from windstorms.	Community Development	PGE	Ongoing
WS-2	Windstorm	Regularly assess the health of trees in Coolidge McClaine Park to prevent damage to buildings and utilities from falling trees.	Parks and Recreation	Public Works Maintenance	Ongoing

Source: City of Silverton HMP Steering Committee, 2016.

**Table A2-12. Status Update: Silverton 2009 Action Items**

2009 Action Item ID	2016 Action Item ID	Action Item	Status	Notes
<b>Multi-Hazard</b>				
1	MH-1	Seek funding for the construction of a new City Hall facility that is outside the flood inundation zone and that is earthquake resistant.	Update language	They already picked a new spot for City Hall - now they need to ensure that it is flood and earthquake resistant.
2	MH-2	Create a Facilities Master Plan that assesses the need for new or updated facilities, and incorporates natural hazard vulnerabilities and mitigation measures for reducing vulnerability.	Ongoing	Hazards should be considered in any future facilities master plan updates.
3	MH-3 MH-4	Establish mutual aid agreements between government agencies and commercial businesses in the event of an emergency (e. g. fuel, heavy equipment, food, etc.).	Done	MORE (Managing Oregon Resources Efficiently) Intergovernmental Agreement has been signed by Silverton.  Now they need fuel agreements with the fuel stations. They would also like a sister city mutual aid agreement (City Manager would be the lead here).
4	MH-5	Educate businesses and governmental organizations about the importance of continuity of operations plans to make them more resilient to natural hazards.	Ongoing	Put information out to businesses about continuity of operations – work with the City and Chamber of Commerce on this.
5		Coordinate efforts with the Red Cross to review and assess potential safety zones/shelter sites.	Done	Silverton Emergency Management Action Committee and CERT have sites identified.
6	MH-6	Encourage the development of VOAD (Voluntary Organizations Assisting in a Disaster) to ease the load on emergency services following a disaster.	Update language	Partner with Marion County on the COAD.
7	-	Purchase and place automatic external defibrillators (AEDs).	Done	
8	MH-7	Improve coordination and evaluation of technical and engineering gaps in communications capabilities for natural hazards event response.	In progress	A consultant is working with Marion County on evaluating the weaknesses of METCOM
9	EQ-9	Encourage citizens to prepare and maintain 72 hour kits.	Ongoing/Update language	They encourage this through the City's website and presentations in the community. Should be 2 week kits.
10	MH-8	Review, and if necessary, revise emergency management and business continuity plans, policies, and ordinances to ensure effective response, business continuity, and post-disaster recovery efforts.	Done/Update language	The EOP and COOP have been completed. They need to be updated again in 2018.

Source: City of Silverton HMP Steering Committee, 2016.

**Table A2-12. Status Update: Silverton 2009 Action Items (Continued)**

2009 Action Item ID	2016 Action Item ID	Action Item	Status	Notes
<b>Drought</b>				
1	-	Update the current water conservation management plan and educate the public on water supply systems.	Done	They did this in February.
<b>Earthquake</b>				
1	EQ-1	Seek voter approval for construction of City of Silverton Police Facility/Emergency Operations Center.	Ongoing	They are trying to locate a facility, then patch together funding.
2	P-5	Coordinate with Marion County to assess the seismic stability of the three bridges that cross Silver Creek and seek funding to reinforce or replace as needed (also applies to flooding concerns).	Ongoing/Update language	Add ODOT - they own some of the bridges.
3	EQ-3	Assess the seismic strength of Silverton's sewage treatment system and develop improvements accordingly as part of the sewage system's current update efforts.	Ongoing	
4	EQ-4	Coordinate with Silverton School District to seek funding to assess and seismically retrofit school buildings that are vulnerable to collapse, including Mark Twain Middle School, the Robert Frost Elementary School, and the Eugene Field Elementary School.	Update language	Remove Eugene Field - it has been closed. There has been some progress on seismic upgrades in the school district.
5	EQ-5	Encourage reduction of nonstructural and structural earthquake hazards in homes, schools, businesses, and government offices through public education.	Update language	This could happen in part through the Map My Neighborhood program. Marion County is a partner on this.
6	EQ-6	Update comprehensive plan to reflect the latest information on seismic hazards.	Ongoing	There is current mapping from DOGAMI and they have done work to stop people from developing. But it should be formalized.
7	EQ-7	Evaluate the installation of automatic shut-off valves in all city facilities that use natural gas.	Ongoing	

Source: City of Silverton HMP Steering Committee, 2016.

**Table A2-12. Status Update: Silverton 2009 Action Items (Continued)**

2009 Action Item ID	2016 Action Item ID	Action Item	Status	Notes
<b>Flood</b>				
1	FL-1	Consult with Oregon Emergency Management to develop flood mitigation actions to address flooding hazards along Silver Creek between James Street and C Street.	Update language	This should be about doing outreach to property owners - there isn't much the City can actually do.
2	FL-2	Develop flood mitigation actions for the waste water treatment facility to prevent damage to the facility and contamination of water resources.	Update language	Needed: reconstruction of the bank and other flood protection.
3	-	Implement the mitigation action items listed in the Silver Creek Dam Emergency Action Plan.	Done	Early warning system is in place.
4		Explore steps needed to qualify Silverton for participation in the National Flood Insurance Program's (NFIP) Community Rating System (CRS).	Delete	The Steering Committee felt that they did not have the resources/capacity to participate in the CRS.
5	FL-3	Continue compliance with the National Flood Insurance Program (NFIP) through the enforcement of local floodplain ordinances.	Ongoing	
6	P-1	Update the city's Flood Insurance Rate Maps (FIRMS) if funding becomes available.	In process	The State is taking the lead on this.
<b>Landslide</b>				
1	-	Use newly acquired LIDAR data to determine areas and buildings at risk to landslides and revise comprehensive and land use policies accordingly.	Done	
2	LS-1	Develop a public infrastructure landslide mitigation program to address the landslide hazard using new LIDAR information obtained from DOGAMI.	Update language	Figure out what infrastructure is at risk.
3	-	Conduct a landslide hazard analysis and risk assessment for the Silverton Reservoir to determine the impacts of a landslide event in the reservoir and needed mitigation measures .	Done	This is part of the dam response plan.

Source: City of Silverton HMP Steering Committee, 2016.



**Table A2-I2. Status Update: Silverton 2009 Action Items (Continued)**

2009 Action Item ID	2016 Action Item ID	Action Item	Status	Notes
<b>Wildfire</b>				
1	WF-1	Implement the wildfire mitigation actions for Silverton found in the Marion County Community Wildfire Protection Plan . Page 70, January 2010, Silverton City Addendum	Update language	The Marion County CWPP is currently being updated.
2	WF-2	Review Marion County's development codes together with the Marion County Planning Department to develop ways to mitigate wildfires near Silverton.	Ongoing	
<b>Windstorm</b>				
1	-	Educate the public about the role of proper tree pruning and stability in preventing damage during windstorms.	Delete	City feels this is beyond their capacity and purview.
2	SW-2	Continue to support/encourage electrical utilities to use underground construction methods where possible to reduce power outages from windstorms.	Ongoing	This is required in the design standards now.
3	SW-3	Regularly assess the health of trees in Coolidge McClaine Park to prevent damage to buildings and utilities from falling trees.	Ongoing	
<b>Severe Winter Storm</b>				
1	-	Continue to educate citizens about ways to weatherize their homes, as well as safe emergency heating equipment.	Delete	The utility companies already are doing this.

Source: City of Silverton HMP Steering Committee, 2016.

# Stayton

**Table A2-13. Stayton Action Item Pool**

Action Item Pool					
Multi-Hazard					
MH-1	Multi-Hazard	Create memoranda of understanding with fuel stations that allows emergency responders first access to fuel.	Public Works, Police, Fire	City Administrator; Finance; City Council	Short Term (1-2 years)
MH-2	Multi-Hazard	Work with fuel stations to understand their storage capacity and backup power capabilities.	Public Works, Police, Fire	City Administrator	Short Term (1-2 years)
MH-3	Multi-Hazard	Develop an agreement with the City's fuel distributor around providing fuel to backup generators during a disaster event.	Public Works, Police, Fire	City Administrator; Finance; City Council	Short Term (1-2 years)
MH-4	Multi-Hazard	Acquire radios for public works.	Public Works	City Administrator; Finance	Short Term (1-2 years)
MH-5	Multi-Hazard	Develop memoranda of understanding with a port-o-potty company to establish "relief stations" throughout town post-event.	City Administrator	Finance; City Council	Short Term (1-2 years)
MH-6	Multi-Hazard	Update the City's Emergency Operations Plan. Invite more critical partners to participate in the plan update, including the hospital and private sector representatives. Update should cover: *Formalizing emergency shelter locations *What supplies to acquire for shelters *How to acquire supplies for shelters *Stronger relationship with the Red Cross - more official shelters and a Red Cross wagon	Emergency Manager	Marion Co.; City Administrator; City Council	Mid-Term (3-5 years)
MH-7	Multi-Hazard	Update the City's Continuity of Operations Plan.	Emergency Manager	Marion Co.; City Administrator; City Council	Mid-Term (3-5 years)
MH-8	Multi-Hazard	Provide mitigation and preparedness information and resources to residents via schools, faith organizations, and utility billings.	Police Chief	Marion Co.; CERT	Ongoing
MH-9	Multi-Hazard	Educate businesses about the importance of continuity of operations plans to make them more resilient to natural hazards.	Emergency Manager	Chamber of Commerce; CERT	Ongoing
MH-10	Multi-Hazard	Create a hazard resilience section on the City's website that provides mitigation and preparedness resources.	City Administrator	Marion Co.	Short Term (1-2 years)
MH-11	Multi-Hazard	Outreach to residents to increase participation in the Everbridge communication system.	Emergency Manager	City Council	Ongoing

**Table A2-53. Stayton Action Item Pool (Continued)**

MH-12	Multi-Hazard	Develop a list of medically dependent individuals.	Policy, Fire, Ambulance, Hospital	Marion Co.	Ongoing
MH-13	Multi-Hazard	Partner with Marion Co. to provide city staff with emergency management and response training.	Emergency Manager	Marion Co.	Ongoing
MH-14	Multi-Hazard	Host one emergency response exercise each year.	Emergency Manager	Marion Co.	Ongoing
MH-15	Multi-Hazard	Develop a list of individuals with medical training who could potentially assist during an event.	Emergency Manager	City Administrator; City Council	Ongoing

**Table A2-13. Stayton Action Item Pool (Continued)**

Action Item ID	Hazard	Action Item	Coordinating Organization	Partner Organizations	Timeline
<b>Action Item Pool</b>					
<b>Drought</b>					
DR-1	Drought	Participate in the Marion Co. Drought Contingency Plan.	Public Works	Marion Co.	Ongoing
<b>Earthquake</b>					
EQ-1	Earthquake	Host outreach events aimed at teaching residents how to turn off their gas and water valves.	Fire Chief	Northwest Natural Gas; Emergency Manager	Ongoing
EQ-2	Earthquake	Following seismic evaluation of West C and Main Street over Silver Creek, seek funding to reinforce or replace as needed.	Public Works Director	Marion C.; ODOT	Mid Term (3-5 years)
EQ-3	Earthquake/ Multi-Hazard	Encourage residents to prepare and maintain two-week (at minimum) survival kits.	Emergency Manager	CERT	Ongoing
<b>Flood</b>					
FL-1	Flood	Work with Marion Co. public works to clear and maintain ditches on county roads.	Public Works	Marion Co. Public Works	Ongoing
FL-2	Flood	Create a memorandum of understanding with Knife River so they will supply sandbags during a flood.	Floodplain Coordinator	City Administrator; Finance; City Council	Short Term (1-2 years)
FL-3	Flood	Identify residents with pumps who might share their equipment during a flood. Create equipment-sharing agreements with interested residents.	Public Works	City Administrator; Finance; City Council	Ongoing
<b>Severe Weather</b>					
SW-1	Severe Storm/Wind storm	Meet with utility companies to build relationships. Outcome should be an understanding of where infrastructure is located, who to contact in an emergency, and strategies for doing more outreach to the community.	Public Works, Police	Marion Co.	Short Term (1-2 years)
SW-2	Severe Storm/Wind storm	Work with Pacific Power to encourage them to upgrade old infrastructure.	Planning	Pacific Power	Short Term (1-2 years)

Source: City of Stayton HMP Steering Committee, 2016.

# Turner

**Table A2-64. Turner Action Item Pool**

Action Item ID	Hazard	Action Item	Coordinating Organization	Partner Organizations	Timeline	Priority
<b>Action Item Pool</b>						
<b>Multi-Hazard</b>						
MH-1	Multi-Hazard	Use existing city public engagement tools (such as monthly utility bills, public reader boards, Facebook pages, etc.) as means of disseminating information to residents regarding hazard preparedness.	Turner Police	City Administrator; Public Works; Turner Fire; Turner Christian Church, Portland General Electric; School District; Marion County Emergency Management	Ongoing	High
MH-2	Multi-Hazard	Implement an automated notification system for disaster alerts and preparedness.	City Administrator (or designee)	Turner Police Department, Turner Fire, Community Emergency Response Team (CERT)	Short Term	High
MH-3	Multi-Hazard	Encourage documentation of the vulnerable populations listed in the Plan, including the creation and maintenance of a list of residents with special medical needs.	City Administrator (or designee)	Turner Police Department, Turner Fire Department	Ongoing	Medium
MH-4	Multi-Hazard	Retrofit the fire station to withstand flood and earthquakes or construct a new, seismically-sound fire station outside the flood zone in a location at minimal risk to natural and man-made hazards.	Turner Fire	City Administrator, OEM, Oregon Emergency Management Seismic Rehabilitation Grant Program Coordinator	Short Term	Medium
MH-5	Multi-Hazard	Conduct annual emergency management table top exercises that include hazardous material release scenarios (in addition to other hazard scenarios).	Turner Fire	Community Emergency Response Team, Marion County Emergency Management; Union Pacific	Ongoing	Low

Source: City of Turner HMP Steering Committee, 2017.

**Table A2-14. Turner Action Item Pool (Continued)**

Action Item ID	Hazard	Action Item	Coordinating Organization	Partner Organizations	Timeline	Priority
<b>Action Item Pool</b>						
<b>Dam Failure</b>						
DF-1	Dam Failure	Coordinate with Marion County Emergency Management to develop an evacuation plan for the City of Turner the event of dam failure.	City Administrator (or designee)	Turner Police , County Emergency Management, County Transit, Army Corps, State Water Services Division	Long Term	Low
DF-2	Dam Failure	Coordinate with Marion County Emergency Management and the Army Corps of Engineers to develop a dam failure notification procedure for the City of Turner.	City Administrator (or designee)	Turner Police, Marion County Sheriff's Office, Army Corps, Marion County Emergency Management	Long Term	Low
DF-3	Dam Failure	Meet with the City of Salem each year to receive updates on the Franzen Reservoir and notify the public of any changes to safety.	City Administrator (or designee)	City of Salem	Ongoing	Medium
DF-4	Dam Failure	Actively engage with the County's efforts to work with the Army Corps of Engineers to assess dam failure likelihood and risks.	Turner Police	Turner Fire, City Administrator, Army Corps of Engineers, Marion County Emergency Management	Long Term	Medium
<b>Earthquake</b>						
EQ-1	Earthquake	Perform seismic assessments of critical infrastructure as resources become available.	City Administrator (or designee)	Oregon Emergency Management Seismic Rehabilitation Grant Program Coordinator	Long Term	Low
EQ-2	Earthquake	Send city staff and other to the County's ATC 20 structural assessment training when the course is offered.	City Administrator (or designee)	Turner Police, Turner Fire, Marion Co.	Ongoing	Medium

Source: City of Turner HMP Steering Committee, 2017.

**Table A2-I4. Turner Action Item Pool (Continued)**

Action Item ID	Hazard	Action Item	Coordinating Organization	Partner Organizations	Timeline	Priority
<b>Action Item Pool</b>						
<b>Flood</b>						
FL-1	Flood	Provide more training on flood insurance.	City Administrator (or designee)	Oregon Department of Land Conservation and Development (DLCD), Oregon Office of Emergency Management (OEM), Federal Emergency Management Agency (FEMA), FEMA trainers	Ongoing	Medium
FL-2	Flood	Identify and prioritize properties to be retrofitted against flood damage.	City Administrator (or designee)	DLCD	Short Term	Low
FL-3	Flood	Have City Council evaluate pursuing certification in the Community Rating System (CRS).	City Administrator (or designee)	DLCD, FEMA, City of Salem, Marion County Public Works	Ongoing	Medium
FL-4	Flood	Implement annual flood vent inspection program for all residential properties in areas at risk of chronic flooding (inside and outside the mapped floodplain).	Planning / Building	CERT, DLCD	Ongoing	Low
FL-5	Flood	Work with the owners of repetitive flood loss buildings in the city to identify cost effective mitigation strategies including consideration of elevation or buy-out.	City Administrator (or designee)	DLCD, OEM	Long Term	Low
FL-6	Flood	Pursue and complete remapping of City floodplain.	City Administrator (or designee)	DLCD, OEM, FEMA	Short Term	High
FL-7	Flood	Provide annual public information materials to Turner residents regarding flood safety practices, including detailed information about sandbagging.	City Administrator (or designee)	City of Turner, CERT	Ongoing	High
FL-8	Flood	Maintain and cultivate partnerships with other government agencies, both local and regional, to plan for flood hazard events.	City Administrator (or designee)	Marion County, City of Salem, MWVCOG, Mill Creek Basin flood management agencies	Ongoing	High
FL-9	Flood	Pursue hiring of a flood coordinator to address flood-related action items.	City Administrator (or designee)	MWVCOG	Ongoing	Medium

Source: City of Turner HMP Steering Committee, 2017.

**Table A2-14. Turner Action Item Pool (Continued)**

Action Item ID	Hazard	Action Item	Coordinating Organization	Partner Organizations	Timeline	Priority
<b>Action Item Pool</b>						
<b>Landslide</b>						
LS-1	Landslide	Implement the Eastwood Drive Stabilization Plan and continue ongoing monitoring of conditions.	Public Works	City Administrator	Ongoing	Low
<b>Severe Weather</b>						
SW-1	Severe Weather	Develop MOUs with private businesses and citizens around equipment and resource sharing during severe weather events, particularly related to providing resources to residents who might be stranded up the hill in the Eastwood area during icy weather.	City Administrator (or designee)	Marion County Public Works, Turner Public Works, Police, Fire	Ongoing	Medium
SW-2	Severe Weather	Monitor the trees in the public right-of-way and maintain to minimize damage during wind or winter storms.	Public Works	Portland General Electric (PGE), Turner Fire Department	Ongoing	Medium
<b>Wildfire</b>						
WF-1	Wildfire	Conduct wildfire prevention outreach, as outlined in the Marion County Community Wildfire Protection Plan (CWPP), to residents in areas where wildfire is a potential concern (e.g. hillside neighborhoods in northeast Turner).	Turner Fire		Ongoing	Low
WF-2	Wildfire	Provide fire suppression outreach throughout the Fire District.	Turner Fire		Ongoing	Low

Source: City of Turner HMP Steering Committee, 2017.



**Table A2-75. Status Update: Turner 2012 Action Items**

2012 Action Item ID	2016 Action Item ID	Action Item	Status	Notes
<b>Multi-Hazard (MH) Action Items</b>				
MH #1	MH-1	Use existing city public engagement tools (such as monthly utility bills, public reader boards, Facebook pages, etc.) as means of disseminating information to residents regarding hazard preparedness.	Ongoing	The City has done this several times and will continue to do so.
MH #2	MH-2	Implement an automated notification system for disaster alerts and preparedness.	Ongoing	The City uses Facebook and Reverse 911 to get information out. Both have been working well and the City will continue to use these alert systems.
MH #3	P-4	Provide public outreach and education to vulnerable populations (such as Turner Retirement Homes, the Christian Convention, Aldersgate, and others, as identified in this plan) regarding hazards.	Ongoing	Individual conversations often occur with these "vulnerable populations," but the City has never instituted something systematic. Marion County is available to help with outreach events.
MH #4	P-5	Partner with existing community organizations to disseminate hazard preparedness information.	Ongoing	City officials and the Fire Department often communicate with these partners. New partners have been added to the list.
MH #5	-	Investigate additional opt-in non-emergency phone notification system.	Done	They have implmented Reverse 911.
MH #6	MH-3	Prioritize vulnerable populations, facilities, and infrastructure as identified on hazard maps.	Ongoing/Update language	The plan already identifies and prioritizes vulnerable populations, facilities, and infrastructure; this actions should be modified.
MH #7	-	Consider additional tools to improve communication and increase public engagement.	Done	The City uses Facebook to reach residents directly to great effect.
<b>Dam Failure (DF) Action Items</b>				
DF #1	DF-1	Coordinate with Marion County Emergency Management to develop an evacuation plan for the City of Turner the event of dam failure.	Ongoing	There hasn't been much progress on this due to insufficient resources.
DF #2	DF-2	Coordinate with Marion County Emergency Management and the Army Corps of Engineers to develop a dam failure notification procedure for the City of Turner.	Ongoing	There hasn't been much progress on this due to insufficient resources.

Source: City of Turner HMP Steering Committee, 2017.

**Table A2-15. Status Update: Turner 2012 Action Items (Continued)**

2012 Action Item ID	2016 Action Item ID	Action Item	Status	Notes
<b>Earthquake Hazard (EQ) Action Items</b>				
EQ #1	-	Coordinate with City of Salem to access existing information and studies related to the Franzen Reservoir.	Done	The studies have been updated.
EQ #2	DF-4	Coordinate with the Army Corps of Engineers to understand the possibility of and risks involved with dam failure.	Update language and move	The County is going to be talking the lead on this and they will communicate information out to Cities.
EQ #3	EQ-1	Perform a thorough assessment of earthquake-vulnerable infrastructure.	Ongoing/Update language	Turner Elementary will be getting \$1.2 million for retrofits. No other assessments have been completed to date though.
EQ #4	MH-4	Seismically retrofit or relocate and rebuild the Turner Fire Station.	Update language and move	Combine with FH #4 and move to Multi-Hazard.  The Fire Department is making some progress on assessing options and moving forward with a retrofit or relocations.
<b>Flood Hazard (FL) Action Items</b>				
FH #1	FL-1	Provide more training on flood insurance.	Ongoing	The City has provided two trainings to citizens and will continue to provide training opportunities.
FH #2	-	Develop a system to evaluate and prioritize man-made infrastructure that may be affecting flood hazards.	Done	The city completed an alternatives analysis for flood mitigation and moved forward with the monitoring system.
FH #3	FL-2	Identify and prioritize properties to be retrofitted against flood damage.	Ongoing/Change priority	There has been some work with repetitive loss property owners.
FH #4	FL-3	Have City Council evaluate pursuing certification in the Community Rating System (CRS).	Ongoing	The Council discussed this in the past and felt that it was not a good use of money, but the City and it's partners will continue to explore options.  Priority should be changed to medium, lead should be changed, new partners should be added, timeline should change to ongoing.
FH #5	-	Develop a water level monitoring program that will track water levels when they go over the bank.	Done	They have installed and implemented the Early Warning Flood system which has worked very well.
FH #6	P-2	Meet with City of Salem flood and emergency management staff on an annual basis to identify and implement collaborative flood mitigation project opportunities.	Ongoing/Update language	Turner has worked with several regional partners to secure grant funding for collaborative flood mitigation projects. These projects will move forward in the near future. Wording should change slightly to include implementation.

Source: City of Turner HMP Steering Committee, 2017.

**Table A2-15. Status Update: Turner 2012 Action Items (Continued)**

2012 Action Item ID	2016 Action Item ID	Action Item	Status	Notes
<b>Flood Hazard (FL) Action Items</b>				
FH #7	FL-4	Implement annual flood vent inspection program for all residential properties in areas at risk of chronic flooding (inside and outside the mapped floodplain).	Ongoing	
FH #8	FL-5	Work with the owners of repetitive flood loss buildings in the city to identify cost effective mitigation strategies including consideration of elevation or buy-out.	Ongoing	There was only one repetitive loss property - it is gone now and they can't rebuild. Priority level should be changed to low.
FH #9	FL-6	Pursue and complete remapping of City floodplain.	Ongoing	As part of the Risk MAP process, Turner should be getting updated floodplain maps.
FH #10	FL-7	Provide annual public information materials to Turner residents regarding flood safety practices, including detailed information about sandbagging.	Ongoing/Update language	CERT can take a big role in making this happen and they would like to do a lot more around this in the future. Partners should be updated.
FH #11	-	Implement systems to provide better real-time information on the possibility of flooding (early warning).	Done	They have installed and implemented the Early Warning Flood system which has worked very well.
FH #12	-	Evaluate the use of detention and similar strategies to mitigate flood events.	Remove	This is a duplication of FH #6.
FH #13	MH-4	Relocate existing or construct new fire station outside the flood zone in a location at minimal risk to natural and man-made hazards.	Update language and move	Combine with EQ #4 and move to Multi-Hazard. The Fire Department is making some progress on assessing options and moving forward with a retrofit or relocations.
FH #14	FL-8	Maintain and cultivate partnerships with other government agencies, both local and regional, to plan for flood hazard events.	Ongoing/Update language	Relationships have been formed and now they're moving forward with projects. Should be reworded to emphasize the maintenance of these relationships
FH #15	FL-9	Pursue hiring of a flood coordinator to address flood-related action items.	Ongoing	This role is currently filled by the City Administrator, but they are still considering hiring a flood coordinator in the future. Priority should be changed to medium.
FH #16	-	Design Delaney Road project with low impact design (LID) standards in mind to mitigate flooding.	Done	
FH #17	-	Update current floodplain regulations to coordinate with NFIP standards and community needs.	Done	This was completed after the last Community Assistance Visit from the NFIP.
FH #18	-	Evaluate small levees on the Turner Retirement Homes and Tabernacle properties to determine if they are functioning as intended.	Remove	This is beyond the ability and capacity of the City. These properties are private and should be the responsibility fo the property owners.
FH #19	-	Evaluate the Mill Creek levy system located directly east of the city boundary to determine if and how it is contributing to flooding (specifically stream bank overtopping).	Remove	This is not practical and they are already addressing these issues via the detention ponds.

Source: City of Turner HMP Steering Committee, 2017.

**Table A2-15. Status Update: Turner 2012 Action Items (Continued)**

2012 Action Item ID	2016 Action Item ID	Action Item	Status	Notes
<b>Hazardous Materials Action Items</b>				
HM #1	MH-5	Conduct annual emergency management table top exercises that include hazardous material release scenarios (in addition to other hazard scenarios).	Update language and move	Move to multi-hazard, Change wording to broaden scope and ensure this action is ongoing, change timeline  They included a hazardous material scenario into the earthquake table top exercises and will continue to do so.
<b>Landslide (LS) Action Items</b>				
LS #1	LS-1	Review and update the Hillside Development Ordinance.	Update language	The Hillside Development Ordinance already takes landslide issues into consideration; this action should be about implementing the Eastwood Drive Stabilization Plan.
LS #2	-	Consider possibility of analyzing landslide risk using Light Detection and Ranging (LIDAR) technology.	Remove	Not necessary. This information is available on DOGAMI's website
<b>Severe Weather (SW) Action Items</b>				
SW #1	SW-1	Review city resources to ensure adequate resources exist to address potential winter weather events.	Update language	Change wording to include MOUs and to focus on getting resource to people who might be stranded up the hill.
SW #2	-	Consider identifying a central public warming facility.	Done	The fire hall and the post office are available as warming stations, and could also be used as cooling stations in extreme heat.
SW #3	-	Clarify relationship between city and PGE in emergency situations.	Done	The Fire Department has a very good relationship with PGE and will continue to maintain those ties.
SW #4	SW-2	Partner with utilities to educate the public about hazardous trees and the damage they can cause in the event of a wind or winter storm.	Ongoing/Update language	PGE already provides outreach around proper tree care. Change wording to focus on the City's responsibility.
<b>Wildfire Hazard (WF) Action Items</b>				
WF #1	WF-1	Conduct wildfire prevention outreach, as outlined in the Marion County Community Wildfire Protection Plan (CWPP), to residents in areas where wildfire is a potential concern (e.g. hillside neighborhoods in northeast Turner).	Ongoing	This has been happening and will continue to happen.

Source: City of Turner HMP Steering Committee, 2017.

# Woodburn

**Table A2-86. Woodburn Action Item Pool**

Action Item ID	Hazard	Action Item	Coordinating Organization	Partner Organizations	Timeline
<b>Action Item Pool</b>					
<b>Multi-Hazard</b>					
MH-1	Multi-Hazard	Develop a voluntary registry of populations that may need particular assistance in an emergency situation.	Emergency Manager	Dispatch, Adult Family Services, Hospitals	Short Term
MH-2	Multi-Hazard	Provide periodic first-aid and CPR classes to members of the public.	Marion County	Red Cross, CERT	Ongoing
MH-3	Multi-Hazard	Participate in Marion County's post-disaster recovery planning efforts.	City Staff	Marion County	Short Term/ Ongoing
MH-4	Multi-Hazard	Continue development of CERT teams to ease the load on emergency services following a disaster.	CERT Program Coordinator (Marion County)		Ongoing
MH-5	Multi-Hazard	Develop and equip emergency shelters to take care of residents and vulnerable populations such as the elderly, the medically fragile, children, people who speak English as a second language, low-income residents, etc.	City Staff	Red Cross, Marion County, School Districts	Short Term/ Ongoing
MH-6	Multi-Hazard	Educate businesses and governmental organizations about the importance of continuity of operations plans to make them more resilient to natural hazards.	Marion County	Emergency Manager, SEDCOR, Chamber of Commerce	Ongoing
MH-7	Multi-Hazard	Ensure that all critical facilities have backup power and emergency operations plans to deal with power outages.	PIO and Emergency Manager	Public Works	Short Term
MH-8	Multi-Hazard	Evaluate the city computer system, network, and website for the ability to function during an emergency.	IT Department		Long Term
MH-9	Multi-Hazard	Develop a traffic management plan for redirecting traffic in the event of a major incident that cuts off roads.	Public Works	Planning	Long Term
MH-10	Multi-Hazard	Work with Marion Co. to provide a series of trainings about dealing with hazardous material.	Emergency Manager	Marion County	Short Term
<b>Drought</b>					
DT-1	Drought	Partner with Marion County to support local agencies' training on water conservation measures.	Emergency Manager	Environmental Services	Short Term

Source: City of Woodburn HMP Steering Committee, 2016.

**Table A2-16. Woodburn Action Item Pool (Continued)**

Action Item ID	Hazard	Action Item	Coordinating Organization	Partner Organizations	Timeline
<b>Action Item Pool</b>					
<b>Earthquake</b>					
EQ-1	Earthquake	Encourage reduction of nonstructural and structural earthquake hazards in homes, schools, businesses, and government offices through public education.	PIO	Emergency Manager, CERT	Ongoing
EQ-2	Earthquake	Complete and maintain an inventory of high-risk buildings, critical facilities, and infrastructure that may be particularly vulnerable to earthquake damage.	Emergency Manager	Marion County	Short Term
EQ-3	Earthquake	Send city employees to the County's ATC 20 training.	Building and Engineering		Short Term/ Ongoing
EQ-4	Earthquake	Evaluate the structural integrity of city-owned buildings.	Building and Engineering (Building Official)		Long Term
EQ-5	Earthquake	Require new city facilities to exceed the minimum structural requirements for seismic loading.	Building Inspection and Permitting	City Council	Long Term
EQ-6	Earthquake	Seek funding to further assess the "probability of collapse" for Lincoln Elementary School, Washington Elementary School, French Prairie Middle School, Nellie Muir Elementary School, and Woodburn High School.	School District		Long Term
EQ-7	Earthquake	Update the city's Comprehensive Plan to reflect the latest information on seismic hazards.	Planning		Short Term
EQ-8	Earthquake	Encourage residents and commercial businesses to purchase earthquake insurance.	Building and Engineering	PIO	Ongoing
EQ-9	Earthquake	Install automatic shut-off valves in all city facilities that use natural gas.	Building Official	City Council	Long Term
EQ-10	Earthquake	Encourage residents to prepare and maintain 2-week survival kits.	PIO	Marion County, CERT, Statesman Journal	Ongoing

Source: City of Woodburn HMP Steering Committee, 2016.

**Table A2-16. Woodburn Action Item Pool (Continued)**

Action Item ID	Hazard	Action Item	Coordinating Organization	Partner Organizations	Timeline
<b>Action Item Pool</b>					
<b>Flood</b>					
FL-1	Flood	Implement mitigation action items in the Public Facilities Plan	Public Works		Short Term/ Ongoing
FL-2	Flood	Partner with Marion County to conduct workshops for target audiences on National Flood Insurance Programs, mitigation activities, and potential assistance from FEMA's Flood Mitigation Assistance and Hazard Mitigation Grant Programs.	Emergency Manager	Marion County Public Works	Ongoing
FL-3	Flood	Continue compliance with the National Flood Insurance Program through the enforcement of local floodplain ordinances.	City Engineer		Ongoing
FL-4	Flood	Update the City's Flood Insurance Rate Maps (FIRMs) - FEMA should be releasing updates soon.	FEMA		Short Term
<b>Volcano</b>					
VC-1	Volcano	Identify critical facilities and equipment that can be damaged by ashfall, and develop mitigation activities to prevent damage to these facilities.	Emergency Manager	Public Works	Long Term
<b>Severe Weather</b>					
SW-1	Wind Storm	Educate the public about the benefits of proper tree pruning and care in preventing damage during windstorms. Outreach outlets include Arbor Day and passing out tree maintenance brochures.	Emergency Manager	PIO, CERT	Ongoing
SW-2	Wind Storm	Educate the community about the risk of downed power lines, aerial power lines in the vicinity of trees, and preparedness measures to take in the event of a power outage.	PGE	PIO, CERT	Ongoing
SW-3	Wind Storm	Require new city facilities to exceed the minimum structural requirements for wind loading.	Building Department		Long Term
SW-4	Severe Winter Storm	Educate homeowners about choosing ice and windstorm-resistant trees and landscaping practices to reduce tree-related hazards in future ice storms.	Emergency Manager	PIO, CERT	Ongoing
SW-5	Severe Winter Storm	Educate citizens about ways to weatherize their homes, as well as safe emergency heating equipment.	Emergency Manager	Marion County, PGE, CERT	Ongoing

Source: City of Woodburn HMP Steering Committee, 2016.

**Table A2-97. Status Update: Woodburn 2010 Action Items**

2010 Action Item ID	2016 Action Item ID	Action Item	Status	Notes
<b>Multi-Hazard</b>				
1	MH-1	Develop a voluntary registry of populations that may need particular assistance in an emergency situation.	Ongoing	They recently began creating a list. Dispatch could help. Adult family services, hospitals, etc., can help.
2	-	Further develop risk assessment maps to show areas at risk for all hazards.	Done	The County has done this.
3	-	Establish mutual aid agreements between government agencies and commercial businesses in the event of an emergency (e.g., fuel, heavy equipment, food, etc.).	Done	MORE (Managing Oregon Resources Efficiently) Intergovernmental Agreement has been signed by Woodburn.
4	EQ-10	Encourage residents to prepare and maintain 72-hour kits.	Ongoing/Update language	CERT is helping with this. They could also get some help from the Statesman-Journal and Marion County.
5	MH-2	Provide periodic first-aid and CPR classes to members of the public.	Ongoing	The Red Cross and CERT can help with providing the trainings. County Emergency Management is point.
6	MH-3	Develop a post-disaster redevelopment plan.	Update language	The County is working on a recovery plan. Long term. Might be done within a year - Woodburn can participate in these efforts.
7	MH-4	Continue development of CERT teams to ease the load on emergency services following a disaster.	Ongoing	Eric Anderson, program coordinator with the County, is the coordinator for all teams.
8	MH-5	Develop and equip emergency shelters to take care of residents and vulnerable populations such as the elderly, the very young, and visitors.	Ongoing	This will be a long term endeavor. Work with Red Cross, County, and the School Districts.
9	MH-6	Educate businesses and governmental organizations about the importance of continuity of operations plans to make them more resilient to natural hazards.	Ongoing	The County recently received a grant to help with this. SEDCOR should be involved, as well as the local Chamber.
10	-	Establish a template that documents the information FEMA wants on each hazard event.	Delete	This is already happening through other mechanisms and doesn't need to be in this plan.
11	-	Obtain and use FEMA HAZUS-MH software.	Delete	This information is all available online.
12	-	Identify necessary warning system improvements.	Done	Woodburn is using Everbridge. Any area that METCOM covers is text to 911 capable.
13	<del>P-3</del> 4	Improve communication equipment in City Hall and in city vehicles, and identify additional radio operators to serve as communication backup in an emergency.	Ongoing	Amateur radio UHF/VHF/Low/Fire capability within CERT. The City should be doing more to beef up communication systems.
14	MH-7	Ensure that all critical facilities have backup power and emergency operations plans to deal with power outages.	Ongoing	Backup generators available for Public Works, the two in-town fire stations, Police, and Ambulance. As they create the list of critical facilities, they should be assessing backup power capabilities.
15	MH-8	Evaluate the city computer system, network, and website for the ability to function during an emergency.	Ongoing	City IT should be in charge of this. Public Works is linked with fiber.
16	-	Identify mitigation projects that could be accomplished by volunteers or interns and involve them in the implementation process.	Delete	They could possibly use an intern for water quality monitoring, but it isn't clear right now how they would use (or have the capacity to manage) an intern around mitigation.

Source: City of Woodburn HMP Steering Committee, 2016.



**Table A2-17. Status Update: Woodburn 2010 Action Items (Continued)**

2010 Action Item ID	2016 Action Item ID	Action Item	Status	Notes
<b>Drought</b>				
1	DT-1	Partner with Marion County to support local agencies' training on water conservation measures.	Ongoing	Environmental Service should be involved in this.'
<b>Earthquake</b>				
1	EQ-1	Encourage reduction of nonstructural and structural earthquake hazards in homes, schools, businesses, and government offices through public education.	Ongoing	Schools currently do outreach. County does outreach in conjunction with chambers of commerce and neighborhood groups. CERT also provides resources around this.
2	EQ-2	Complete inventory of high-risk buildings, critical facilities, and infrastructure that may be particularly vulnerable to earthquake damage.	Ongoing	They have not yet completed this inventory, but think it is important. Marion County might be able to provide some support - The ATC 20 training could beef up the City's ability to do assessments and create the list.
3	EQ-4	Evaluate the structural integrity of city-owned buildings.	Ongoing	Engineering should be the lead on this - the Building Official would probably be the one to do the assessment. Participating in the ATC 20 training would be important to making this happen.
4	EQ-5	Require new city facilities to exceed the minimum structural requirements for seismic loading.	Ongoing	Some facilities are receiving or have received upgrades - this should be ongoing.
5	EQ-6	Seek funding to further assess the "probability of collapse" for Lincoln Elementary School, Washington Elementary School, French Prairie Middle School, Nellie Muir Elementary School, and Woodburn High School.	Ongoing	No progress has been made so far, but the School District thinks this important.
6	EQ-7	Update the city's Comprehensive Plan to reflect the latest information on seismic hazards.	Ongoing	No updates have occurred since 2005, but this is important. City Planning should be the lead.
7	EQ-8	Encourage residents and commercial businesses to purchase earthquake insurance.	Ongoing	This should be part of the City's ongoing public outreach, in partnership with the Chamber.
8	EQ-9	Install automatic shut-off valves in all city facilities that use natural gas.	Ongoing	The Building Official would be in charge of this.

Source: City of Woodburn HMP Steering Committee, 2016.

**Table A2-17. Status Update: Woodburn 2010 Action Items (Continued)**

2010 Action Item ID	2016 Action Item ID	Action Item	Status	Notes
<b>Flood</b>				
1	P-1	Widen culverts near Wyffel Park and Gatch Street between Lincoln Street and Hardcastle Avenue.	Update language	They have done some work at Hardcastle and maybe Lincoln. This is really critical work and should be incorporated into the next Capital Improvements Plan.
2	FL-1	Implement mitigation action items in the Public Facilities Plan.	Ongoing	
3	FL-2	Partner with Marion County to conduct workshops for target audiences on National Flood Insurance Programs, mitigation activities, and potential assistance from FEMA's Flood Mitigation Assistance and Hazard Mitigation Grant Programs.	Ongoing	Woodburn's floodplain ordinance is regularly enforced. They can work with the County on some of this outreach.
4	FL-3	Continue compliance with the National Flood Insurance Program through the enforcement of local floodplain ordinances.	Ongoing	They do this regularly.
5	FL-4	Update the city's Flood Insurance Rate Maps (FIRM) as funding becomes available.	Ongoing	FEMA should be releasing new maps soon.
<b>Volcano</b>				
1	VC-1	Identify critical facilities and equipment that can be damaged by ashfall, and develop mitigation activities to prevent damage to these facilities.	Ongoing	This can be part of the list included in the earthquake actions.
<b>Windstorm</b>				
1	SW-1	Educate the public about the benefits of proper tree pruning and care in preventing damage during windstorms.	Update language	The City has a brochure for tree maintenance. Public Works does outreach on Arbor Day.
2	SW-2	Educate the community about the risk of downed power lines, aerial power lines in the vicinity of trees, and preparedness measures to take in the event of a power outage.	Ongoing	PGE does outreach.
3	SW-3	Require new city facilities to exceed the minimum structural requirements for wind loading.	Ongoing	Building Department would be in charge of this.
<b>Severe Winter Storm</b>				
1	SW-4	Educate homeowners about choosing ice and windstorm-resistant trees and landscaping practices to reduce tree-related hazards in future ice storms.	Ongoing	
2	SW-5	Educate citizens about ways to weatherize their homes, as well as safe emergency heating equipment.	Ongoing	PGE also does outreach around this. Marion County has many materials about weatherization that the City can use in their outreach efforts.

Source: City of Woodburn HMP Steering Committee, 2016.

## Priority Actions for Cities

The jurisdictions participating in this Hazard Mitigation Plan also prioritized actions. Each steering committee considers the potential impact and ease of implementation associated with each action item to assist with prioritization. This resulted in a set of priority actions that will greatly reduce vulnerability to hazards, are highly achievable, or both. Below, we include Cities' priority actions. We do not provide action item forms for these actions because the City steering committees did not believe the action item forms would significantly aid them in implementing the priority actions.

**Table AI-1. Aumsville Priority Actions**

Action Item ID	Hazard	Action Item	Coordinating Organization	Partner Organizations	Timeline
<b>Priority Actions</b>					
P-1	Flood	Remove culvert on 1st and Gordon and replace with a bridge.	Public Works	City Administration/	Short-Term
P-2	Flood	Upsize culverts on Bishop Rd.	Public Works	City Administration/	Short-Term
P-3	Flood	Create an agreement for flood mitigation along Beaver Creek and Mill Creek/Highberger Ditch (agreement would have to be regional). Aumsville could do the following: *Use city property as a water detention space *Increase the detention capacity to accommodate effects of new development *Update the Stormwater Mangement Plan	City Administration	Public Works, State Representatives, regional partners	Ongoing
P-4	Earthquake	Assess the seismic vulnerability of the City's reservoir (as described in the 2015 Water Plan). Retrofit facility as funding becomes available.	Public Works	City Administration/ City Council	Short-Term/ Long Term

**Table AI-2. Aurora Priority Actions**

Action Item ID	Hazard	Action Item	Coordinating Organization	Partner Organizations	Timeline
<b>Priority Actions</b>					
P-1	Multi-Hazard	Create and publicize alternative transportation routes in the event of road closures.	City Planner	Public Works	Short-Term
P-2	Earthquake	Seek funding to further assess the "probability of collapse" for North Marion High School.	N. Marion School District		Short-Term
P-3	Earthquake	Work with the Salem Red Cross to identify potential shelters within the city. Create MOUs and partner with Red Cross to make it official.	City Recorder	Administrative Assistant	Short-Term
P-4	Windstorm	Identify backup power needs and acquire new backup generators (not propane) for the School District (which serves as the Emergency Shelter).	N. Marion School District		Short-Term
P-5	Windstorm	Acquire emergency backup generators for all critical facilities (including City Hall and 2 wells). Do not purchase generators fueled by propane.	Public Works	Administrative Assistant	Short-Term

**Table AI-3. Keizer Priority Actions**

Action Item ID	Hazard	Action Item	Coordinating Organization	Partner Organizations	Timeline
<b>Priority Actions</b>					
P-1	Earthquake	Work with Cities of Salem and Turner to perform seismic evaluation of wastewater transmission infrastructure and impact on drinking water supply.	City of Keizer Public Works	City of Turner; City of Salem	Short Term (1-2 years)
P-2	Earthquake	Conduct seismic evaluation of Keizer's drinking water well field.	City of Keizer Public Works		Mid Term (3-5 years)
P-3	Earthquake	Conduct seismic evaluation of Chemawa, Dearborn, and Alder Street bridges over Claggett Creek	City of Keizer Public Works		Short Term (1-2 years)
P-4	Earthquake	Assess the feasibility and cost to seismically retrofit Keizer's public works facilities (City shops).	City of Keizer Public Works		Long Term (5 years)

**Table AI-4. Mill City Priority Actions**

Action Item ID	Hazard	Action Item	Coordinating Organization	Partner Organizations	Timeline
<b>Priority Actions</b>					
MH #1	Multi-Hazard	Review the Natural Resource Chapter of the Comprehensive plan document and modify policies to reflect new hazard information. [roughly 20 hours] General Fund	Mill City	Planning & City Staff	September 2017
MH #2	Multi-Hazard	Before purchase, city staff should first assess the amount of KWH needed to run city facilities. (100 KWH) diesel generators cost around \$25,000. General Fund, MWCOG grants/loans	Mill City	Planning & City Staff	December 2018

**Table AI-5. Silverton Priority Actions**

Action Item ID	Hazard	Action Item	Coordinating Organization	Partner Organizations	Timeline
<b>Priority Actions</b>					
P-1	Flood	Update Silverton Flood Insurance Rate Maps (FIRMS).	Silverton Flood Plain Coordinator	Oregon Risk MAP; Silver Jackets; DOGAMI	Mid Term (3-5 years)
P-2	Dam Failure	Update the dam breach inundation scenario map.	Public works, Engineering	Marion Co.; UASCE	Short Term (1-2 years)
P-3	Dam Failure	Conduct seismic evaluation of Silver Creek Dam and Silverton water supply reservoir.	Public Works Director, Water Quality Supervisor	USACE	Short Term (1-2 years)
P-4	Dam Failure	Develop evacuation strategy for both local and regional dam failure scenarios.	Silverton Emergency Management	USACE	Mid Term (3-5 years)
P-5	Earthquake	Conduct seismic evaluation of West C and Main Street bridges over Silver Creek	Silverton Public Works	Marion Co., ODOT	Short Term (1-2 years)

**Table AI-6. Stayton Priority Actions**

Action Item ID	Hazard	Action Item	Coordinating Organization	Partner Organizations	Timeline
<b>Priority Actions</b>					
P-1	Flood	Upsize stormwater pipes at 6th and Pine, at the north end of Silvan Springs, and other streets with chronic localized flooding issues.	Public Works	City Administrator; Finance; City Council	Short Term (1-2 years)
P-2	Multi-Hazard	Assess the wastewater and water treatment plants' ability to function during different hazard scenarios and begin to mitigate issues. This could include assessing and gathering supplies that will allow the plants to operate under emergency conditions and upgrading the facilities so they are more resilient.	Public Works	City Administrator; Finance; City Council	Short Term (1-2 years)
P-3	Earthquake	Purchase two portable temporary bridges to facilitate redundant transportation access to the wastewater treatment plant (via Wilco Rd. and Jetters Way) and downtown (via N. First Ave.).	Public Works	City Administrator; Finance; City Council	Short Term (1-2 years)
P-4	Earthquake	Acquire portable water filtration system(s) to improve water redundancy.	Public Works	City Administrator	Short Term (1-2 years)
P-5	Multi-Hazard	Purchase a satellite phone to improve communication redundancy.	Emergency Manager (Police Chief)	City Administrator	Short Term (1-2 years)

**Table AI-7. Turner Priority Actions**

Action Item ID	Hazard	Action Item	Coordinating Organization	Partner Organizations	Timeline	Priority
<b>Priority Actions</b>						
P-1	Flood	Add water level monitoring equipment to the Marion Road Bridge, south of Mill Creek.	City Administrator (or designee)	CERT; Mill Creek Basin flood management agencies	Short Term	Top
P-2	Flood	Meet with City of Salem flood and emergency management staff on an annual basis to identify and implement collaborative flood mitigation project opportunities.	City Administrator (or designee)	Public Works, City of Salem, Marion Co., OEM, City of Aumsville, Beaver Creek Watershed Council, Santiam Watershed Council	Ongoing	Top
P-3	Multi-Hazard	Purchase a portable water filtration device.	Turner Public Works	City Administrator	Short Term	Top
P-4	Multi-Hazard	Provide public outreach and education to vulnerable populations (such as Turner Retirement Homes, the Christian Convention, Aldersgate, and others, as identified in this plan) regarding hazards.	City Administrator (or designee)	Turner Police, Turner Fire, Marion Co.	Ongoing	Top
P-5	Multi-Hazard	Partner with existing community organizations to disseminate hazard preparedness information.	City Administrator (or designee)	Turner Police Department, Turner Fire Department, Turner Christian Church, Cascade School District, Church of God, Turing Point	Ongoing	Top

**Table AI-8. Woodburn Priority Actions**

Action Item ID	Hazard	Action Item	Coordinating Organization	Partner Organizations	Timeline
<b>Priority Actions</b>					
P-1	Flood	Include culvert widening projects for Wyffel Park and Gatch Street between Lincoln St. and Hardcastle Ave. in upcoming Capital Improvement Plans.	Public Works		Short Term
P-2	Flood	Update the Stormwater Master Plan to include important flood mitigation projects.	Public Works		Short Term
P-3	Multi-Hazard	Improve communication equipment in City Hall and in city vehicles, and identify additional radio operators to serve as communication backup in an emergency.	City, Police, Fire		Short Term
P-4	Multi-Hazard	Work to streamline the communication systems between all emergency responders. This might include purchasing additional equipment for some units.	City, Police, Fire		Short Term

# APPENDIX B: PLANNING AND PUBLIC PROCESS

This section describes the public process used to update the 2016 Marion County Multijurisdictional Hazard Mitigation Plan.

## Project Background

Marion County partnered with the University of Oregon Community Service Center (CSC) to update their 2011 Marion County Hazards Mitigation Plan (HMP). The Disaster Mitigation Act of 2000 requires communities to update their mitigation plans 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 CSC work with non-federal match provided by Marion County.

A total of four lifeline sector analysis sessions were held in March 2016. This analysis was then presented to the Marion County HMP steering committee, which provided hazard history and information about critical infrastructures and facilities within the county, evaluated and approved action items as a result of earlier analysis, and developed an implementation and maintenance strategy for the plan. Cities included within the Marion County HMP include Aumsville, Aurora, Detroit, Gates, Idanha, Keizer, Mill City, Silverton, Stayton, Turner and Woodburn.

## 2016 Plan Update Changes

There are a number of significant changes between the 2016 HMP and the 2011 NHMP. The 2016 HMP contains a lifeline sector analysis, which is a major part of the risk assessment section. It also takes a holistic approach to hazard planning, and focuses on natural, technological and manmade hazards. There are also new cities participating in the plan that did not participate in the 2011 NHMP.

## 2016 Plan Update Changes

The sections below discuss *major* changes made to the HMPs during the 2015-2016 plan update process. Major changes include the replacement or deletion of large portions of text, changes to the plan's organization, new mitigation action items, and the addition of city addenda to the plan. If a section is not addressed in this memo, then no significant changes occurred.

The plan's format and organization have been modified slightly to match ongoing changes to OPDR's plan templates. Table B-1 below lists the 2011 Marion County NHMP plan section names and the corresponding 2016 section names, as updated (major Volumes are highlighted). This memo will use the 2016 plan update section names to reference any changes, additions, or deletions within the plan.

**Table B-1 Changes to Plan Organization**

<b>2011 Marion County MNHMP</b>	<b>2016 Marion County MJHMP</b>
Acknowledgements	Acknowledgements
Table of Contents	Table of Contents
Approval Letter	Approval Letters and Resolutions FEMA Review Tool
<b>Volume I: Basic Plan</b>	<b>Volume I: Basic Plan</b>
Executive Summary	Plan Summary
Section 1: Introduction	Section 1: Introduction
Section 2: Community Overview	Appendix C: Community Profile
N/A	Section 2: Risk Assessment
Section 3: Mission, Goals and Action Items	Section 3 Mitigation Strategy
Section 4: Plan Implementation and Maintenance	Section 4: Implementation and Maintenance
<b>Volume II: Hazard Analysis</b>	
Dam Failure	Volume II incorporated into Volume I, Section 2: Risk Assessment
Drought	
Earthquake	
Flood	
Landslide	
Volcanic Eruption	
Wildfire	
Wind Storm	
Winter Storm	
<b>Volume II: City/Special District Addenda</b>	<b>Volume II: City Addenda</b>
City of Aurora	City of Aumsville
	City of Aurora
	City of Detroit
	City of Gates
	City of Idanha
City of Keizer	City of Keizer
City of Silverton	City of Silverton
	City of Stayton
	City of Turner
City of Woodburn	City of Woodburn
	City of Mill City
<b>Volume III: Resource Appendices</b>	<b>Volume III: Appendices</b>
Appendix A: Action Item Forms	Appendix A: Action Items
Appendix B: Planning and Public Process	Appendix B: Planning and Public Process
Appendix C: Economic Analysis of Natural Hazard Mitigation Projects	Appendix C: Community Profile
Appendix D: Stakeholder Survey Report	Appendix D: Lifeline Sector Profile
Appendix E: Resource Directory	Appendix E: Economic Analysis of Natural Hazard Mitigation Projects
	Appendix F: Grant Programs

One significant structural change in the plan is the incorporation of hazards information contained in Volume II of the 2011 plan into the Risk Assessment section of Volume I. This change was made to streamline the plan and limit redundancy with hazard information contained in other publically available plans and reports. In addition, the community profile section has been renamed and moved to an appendix. Also related to the risk assessment is the incorporation of a specific analysis of lifeline infrastructure sectors, a significant focus of this plan update cycle. A final noteworthy change in the 2016 plan is the significant increase in the number of city addenda.

## Front Pages

1. The plan's cover has been updated.
2. Acknowledgements have been updated to include the 2016 project partners and planning participants.
3. The FEMA approval letter, review tool, and county and city resolutions of adoption are included. *(will be included with the final version of the HMP)*

## Volume I: Basic Plan

Volume I provides the overall plan framework for the 2016 Multi-jurisdictional HMP update. Volume I includes the following sections:

### Plan Summary

The 2016 HMP includes an updated plan summary that provides information about the purpose of natural hazards mitigation planning and describes how the plan will be implemented.

### Section 1: Introduction

Section 1 introduces the concept of natural hazards mitigation planning and answers the question, "Why develop a mitigation plan?" it has been reformatted for efficiency and readability. The new text describes the federal requirements that the plan addresses and gives examples of the policy framework for natural hazards planning in Oregon. Section 1 summarizes the 2016 plan update process, and provides an overview of how the plan is organized. Section 1

### Section 2: Risk Assessment

Section 2, Risk Assessment, provides a focused assessment of hazards and vulnerabilities within a single section. The risk assessment 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 a period of time. Changes to Section 2 include:

- 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.

- DOGAMI is currently conducting a multi-hazard risk assessment (Risk Report) for the Middle-Willamette Valley, including portions of Marion County. The Risk Report will provide a quantitative risk assessment that informs communities of their risks related to certain natural hazards (including earthquake). The data included in this plan is the best available data, outdated information has been removed. Once complete the county and cities will incorporate the risk assessment information to provide greater detail to sensitivity and exposure to the profiled hazards.
- Links to specific hazard studies and data are embedded directly into the plan where relevant and available.
- NFIP information was updated.
- The hazard vulnerability analysis/ relative risk has been updated for the county and cities (city information is included with more detail within Volume II).

### Section 3: Mitigation Strategy

This section provides the basis and justification for the mission, goals, and mitigation actions identified in the HMP. Major changes to Section 3 include the following:

- The mission and goals were reviewed and revised to align with the State NHMP. The cities reviewed the revised mission and goals and agreed to replace their existing mission and goals with this version.
- Action items were reviewed, revised and prioritized.

### Section 4: Plan Implementation and Maintenance

Marion County Emergency Management will continue to convene and coordinate the county steering committee (documentation for the city conveners is contained within the jurisdictional addenda of Volume II).

## Volume II: Jurisdictional Addenda

A significant focus of this planning effort has been to increase the involvement and participation of cities in Marion County. With 20 incorporated cities, the county is committed to a regional planning approach that emphasizes partnerships and local collaboration. Given the sheer number of cities, completion of Volume II has been delayed. The county is requesting county plan review at this time, with plans to submit Volume II in early 2017.

## Volume III: Appendices

Below is a summary of the appendices included in the 2016 HMP:

### Appendix A-I: Priority Action Items

Priority actions are listed in Appendix A-1. Priority action items are based upon continuous community needs, the identification of new hazards, and current needs based upon the community risk assessment. They are designed to be feasibly accomplished within the next five years. Action item forms were created for priority actions that formerly did not have

them; others have been updated to account for new information. The action item forms reference the status of the action item, timeline, rationale, implementation measures, and funding sources. Coordinating and partner organizations, for Marion County, are listed in Table 3-2 within Section 3, *Mitigation Strategy*, and within the city addenda for each of the participating cities.

#### **Appendix A-2: Action Item Pool**

A list of other actions is provided within this appendix. These actions are not considered high priority, however, the steering committees have the option to consider all actions items for implementation at any time. This strategy allows the jurisdictions to prioritize actions that are most likely to be implemented under current circumstances yet still allows their mitigation strategies as new situations, resources, and capabilities arise (such as capitalizing on funding sources for an action item that is not currently listed as high priority). The steering committees will formally review the actions in this section during their semiannual or annual meetings. Action items may also be considered, or added, to the list of high priority actions at any time.

#### **Appendix B: Planning and Public Process**

The planning and public process appendix reflects changes made to the Marion County MJHMP and documents the 2016 planning and public process.

#### **Appendix C: Community Profile**

The community profile has been updated to conform to the OPDR template and consolidates information for Marion County and participating cities.

#### **Appendix D: Lifeline Sector Analysis**

This new section provides in-depth risk and vulnerability information for the four critical lifeline sectors identified by Marion County: Transportation, Water, Energy and Communication.

#### **Appendix E: Economic Analysis of Hazard Mitigation Projects**

Updates are provided for the economic analysis of natural hazard mitigation projects.

#### **Appendix F: Grant Programs**

Some of the previously provided resources were deemed unnecessary since this material is covered within the Oregon NHMP and appropriate resources are provided within the Hazard Annexes of Volume II. Updates were made to the remaining grant programs and resources.

## **2016 HMP Public Participation Process**

The steering committee is directly involved in reaching out the public in the review and update of the natural hazard mitigation plan. Although members of the steering committee represent the public to some extent, the residents of Marion County and the participating cities are also given the opportunity to provide feedback about the Plan. The plan will undergo review on an annual basis.

To engage the public, Marion County employed multiple strategies, summarized below:

- Marion County Newsletter May 17  
(<https://www.facebook.com/MCEmergency/photos/pcb.995933150494504/995897567164729/?type=3&theater>)
  - Also tagged in a Facebook mention of Hazard Mitigation Plan update.
- Social Media Outreach:
  - SEDCOR April 13-14 [Facebook](#)/[Twitter](#) posts (presentation from lifelines)
  - Lifeline meeting Feb 29 Multi-jurisdictional Hazard Mitigation Plan #preparedness;#hazard Mitigation
  - Lifeline meeting Feb 26 Communication #cascadia; #hazardmitigation;#preparedness;#lifeline; #energy
- Emailed out THIRA Survey April 18th to our partners (19 participants); responses are incorporated into and inform the County THIRA.
- Throughout the MJHMP update process, provided regular briefings to the Marion County Emergency Management Advisory Council. The EMAC meets monthly on the 3rd Tuesday of the month (note that private sector representatives attend these meetings).
- August 9, 2016 public meeting presentation to the Marion County Board of Commissioners. The meetings purpose was:
  - To familiarize Commissioners with current efforts to update the Marion County Multijurisdictional Hazard Mitigation Plan
  - To receive Commissioner input on hazard mitigation strategies and actions prior to releasing the plan for public comment and FEMA review
  - Provide a community venue for public engagement, input, and awareness
  - August 2016 Marion County Emergency Management Newsletter-topic Hazard Mitigation Gov Delivery:  
<https://admin.govdelivery.com/abe/bulletins/764726/copy?render=edit>
- Posted the DRAFT MJHMP for public comment from December 6 through December 22, 2016. MCEM used multiple outlets to publicize the plan review opportunity:
  - Gov Delivery (Gov Delivery is a platform for all Marion County Departments to share information with the internal departments and the public. The Gov Delivery system/software houses bulletins, calendars, news, alerts and more for the County.)
  - Marion County Facebook
  - Marion County Emergency Management Website
  - Board of Commissioners Monthly News Bulletin
  - KMUZ Radio Press Release
  - February 22, 2017 THIRA where 107 stakeholders participated. Reviewed the Lifeline sector meeting outcomes.

Throughout the process, Marion County collected input and feedback. Where applicable and appropriate, feedback is integrated into the document. MCEM has also considered feedback as part of ongoing enhancements to the Marion County Emergency Management program.

## Whole Community Engagement

The Marion County MJHMP 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 and City steering committees guided the Plan development process. The update process included representatives from the following jurisdictions and agencies:

- Marion County
- City of Aumsville
- City of Aurora
- City of Detroit
- City of Gates
- City of Idanha
- City of Keizer
- City of Mill City
- City of Salem
- City of Silverton
- City of Turner
- City of Woodburn
- East Salem Suburban Neighborhood Association
- North Marion School District
- Santiam Water Control District
- Strategic Economic Development Corporation (SEDCOR)
- Lifeline Sector Communications: Capital Community Television (CCTV), Amateur Radio Emergency Service (ARES), Marion Area Multi-Agency Emergency Telecommunications Dispatch Center (METCOM 911), Santiam Canyon Phone, Willamette Valley Communications Center (WVCC), Frontier, Verizon, Oregon Statewide Interoperability Coordinator (SWIC), Service Master of Salem, Pacific Gas and Electric Company (PGE).
- Lifeline Sector Energy: Department of Energy, NW Natural, Consumers Power, Portland General Electric, Williams, and Pacific Gas and Electric.
- Lifeline Sector Transportation: City of Salem, City of Woodburn, Marion County Public Works, Marion County Sheriff's Office, ODOT, Salem Public Works, Salem-Keizer School District, Salem-Keizer Transit, Cherriots, and Woodburn Transit Service.
- Lifeline Sector Water: City of Stayton, City of Salem, City of Keizer, City of Turner, Marion County, North Santiam Watershed Council.

The Marion County Emergency Manager convened the planning process will take the lead in implementing, maintaining and updating the county plan. Each participating jurisdiction has named a local convener who is responsible for implementing, maintaining and updating their respective local plan addenda. Marion County is dedicated to directly involving the public in the continual review and update of the hazards mitigation plan. The county achieves this through systematic engagement of a wide variety of active groups, organizations or committees, including but not limited to: SEDCOR, public and private infrastructure partners, Oregon National Guard, watershed and neighborhood groups, THIRA committee, Mid-Willamette Emergency Communications Collaborative and numerous others. 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 Plan throughout the implementation and maintenance period. Throughout the plan update process, the county engaged over 200 stakeholders through a variety of meetings, workshops, presentations, interviews, and focus groups:

- **Marion County HMP steering committee.** Marion County formally convened the HMP steering committee on two occasions to discuss and revise the plan. Steering committee members contributed data and maps, and reviewed and updated the community profile, risk assessment, action items, and implementation and maintenance plan.
- **Lifeline Sector Assessment.** The UO Community Service Center conducted assessments of four Marion County identified lifeline sectors – communication, energy, transportation, and water. The assessment included review of each sector’s adaptive capacity and vulnerabilities, as well as critical dependencies and interdependencies.
- **Strategic Economic Development Corporation (SEDCOR) stakeholder input.** Marion County and the CSC team briefed and solicited input from SEDCOR members at their April 13, 2016 “Secure Our Lifelines” event. This event was conducted as part of SEDCORs “Cascadia: Oregon’s Greatest Natural Threat Series.”
- **Threat Hazard Identification and Risk Assessment (THIRA) process.** In conjunction with the HMP update, Marion County initiated FEMA’s a four step common risk assessment process known as THIRA. The process engages individuals, businesses, faith-based organizations, nonprofit groups, schools and academia and all levels of government to better understand its risks and estimate capability requirements as they relate to the 32 core capabilities.
- **North Santiam Watershed Drought Contingency Plan (DCP).** Marion County participated in the Santiam Water Control District’s Bureau of Reclamation funded Drought Planning project. Findings and recommendations of the Drought Task Force are included by reference where appropriate in the HMP.
- **Marion County Community Wildfire Protection Plan (CWPP).** During the HMP update, Marion County Emergency Management, the Fire Defense Board and the Oregon Department of Forestry initiated an update of the Marion County Community Wildfire Protection Plan. Developed to meet the requirements of the Healthy Forest Restoration Act, FEMA Disaster Mitigation Act of 2000, National

Cohesive Wildland Fire Management Plan, 2010 Comprehensive Strategy, Senate Bill 360, Flame Act 2009, and the Oregon Statewide Land Use Planning Goal 4 and 7, findings and recommendations of the CWPP working group are included by reference where appropriate in the HMP.

- **Marion County Emergency Operations Plan (EOP).** During the HMP update, Marion County Emergency Management initiated an update of its Emergency Operations Plan. To ensure consistency across local hazard planning documents, the risk assessment information in the HMP is consistent with the EOP, THIRA and other emergency management assessment data and plans.
- **FEMA Risk Map Middle-Willamette Watershed Discovery.** FEMA Region X initiated the Discovery effort for the Middle Willamette Watershed in December 2015. Risk MAP Discovery is a process of data collection, hazard mapping, and cooperative information exchange with community stakeholders to understand a watershed area. FEMA Region X is deciding if a flood risk project is appropriate. If so, FEMA Region X and Marion County Emergency Management will collaborate on project planning.
- **Hazardous Materials: Commodity Flow Study.** In February 2016 the Marion County Emergency Management Office commissioned a Hazardous Materials Commodity Flow Study (HMCFS), to be carried out by the Center for Public Service (CPS) research team at Portland State University. PSU completed the study in accordance with recommendations from the US Department of Transportation (USDOT). The HMCFS identifies the types and amounts of hazardous materials transported through Marion County and provided a methodological approach to understanding the unique hazards that may be present. The HMCFS findings provide the data necessary to estimate risks facing the County and provide grounding for emergency response and other emergency management related plans.

The Marion County Emergency Manager is responsible for implementing, maintaining, and conducting future updates of the plan. The public will also have the opportunity to provide feedback about the plan in an ongoing fashion. The steering committee will meet on a semi-annual basis to discuss implementation of the plan, as well as updating the plan.

## Lifeline Sector Analysis

A cornerstone of the 2016 HMP is the inclusion of “lifeline sectors” or sectors that are critical to the successful response and recovery of a community after a disaster event. Although more sectors can be added as the plan is updated, the sectors of water, communication, energy, and transportation were chosen to start. Four sector-specific meetings were held with key private, public, and nonprofit agencies and organizations. Each meeting was three hours and covered hazard identification, critical facility and infrastructure mapping, and scenario planning for a chronic hazard (winter storm) and a catastrophic hazard (Cascadia subduction zone earthquake). These sessions were held the following days:

- **Energy:** February 26, 2016 (9:30 AM – 12:30 PM)
- **Communication:** February 26, 2016 (1:00 PM – 4:00 PM)

- **Transportation:** February 29, 2016 (9:30 AM – 12:30 PM)
- **Water:** February 29, 2016 (1:00 PM – 4:00 PM)

## Steering Committee

The Marion County Emergency Manager selected and convened the steering committee, which played a vital role in shaping the plan. The steering committee guided the update process through several steps, including updates to the hazard history, action item development and review, and determining a strategy for implementation and maintenance. The steering committee met on the following dates:

- **Meeting #1: Kickoff, Hazard Identification, and Community Profile** - March 8, 2016
- **Meeting #2: Public Involvement Strategies, Goal Updates, and Action Item Review** - April 27, 2016
- **Meeting #3: Public Outreach Strategies, Action Item Prioritization, and Plan Implementation and Maintenance** - May 16, 2016

The steering committee formed under the guidance of Ed Flick, the Marion County Emergency Manager, and Kathleen Silva, the Marion County Emergency Preparedness Coordinator. The steering committee invested considerable time into the mitigation plan. For a full list of steering committee members, see the Acknowledgments section of this HMP.

The following pages provide copies of meeting agendas and sign-in sheets from the lifeline sector meetings, as well as both the Marion County HMP Steering Committee meetings.

Lifeline Sector Meeting Sign-In

Figure B-1: Energy Lifeline Sector Sign-in Sheet

Marion County Multi-Jurisdictional Hazard Mitigation Plan

Sector: ENERGY  
 Date: 2/26 → 9:30-12:30

Name	Organization	Email	Phone Number
TIM CUSTER	PGE	TIM.CUSTER@PGE.COM	503 932-2420
MIRIE GRANEY	MWH Consulting	michael.graney@comcast.net	503-364-9505 - left early
Glen Collins	DHS	Glen.Collins@hq.dhs.gov	503 250 2815 - came late, left early



## Figure B-2: Communications Lifeline Sector Sign-in Sheet

### Marion County Multi-Jurisdictional Hazard Mitigation Plan

Sector: COMMUNICATIONS  
Date: 2/26/2016

Name	Organization	Email	Phone Number
Darren Rice	CITY OF SALEM - WUCC 911	drice@cityofsalem.net	503-763-3337
ALAN BUSHONG	CCTV	ALAN@CCTV3.SALEM.ORG	503-584-2288 X 31
PAUL GUTHRIE	ARES	guthrie.paul@gmail.com	503-508-2091
GERRIT WOOD	SERVICE MASTER OF SALEM	gwood@sm.salem.com	503-585-4017
ERIK HOEFER	SCTC Stayton Co-op Telephone Co.	erik@sctcweb.com	503-769-2121
Gina AUDRITSH	METROM 911	gina.auditsh@ci.woodburn.or.us	503 982-2344
Broad JOHNSON	METROM 911	Broad.Johnson@ci.woodburn.or.us	503 982 2351
CHARLES CULLEN	FRONTIER	Charles.Cullen@ftr.com	503-601-9457
VERN BUSBOOM	FRONTIER	VERN@busboom@ftr.com	503 465 1291
Ann Steeves	PGE	ann.steeves@pge.com	503-464-7894
Sara Kirkwood	Verizon	Sara.Kirkwood@vzw.com	502 727 0140
David Solos	St. of Oregon	david.solos@oregon.gov	971 701 1071
FRANK AFF	Frontier Communications	frank.aff@ftr.com	(503) 307-0547
ROGER STEVENSON	CITY OF SALEM	RSTEVENSON@CITYOFSALEM.COM	503 763 3331

**Figure B-3: Transportation Lifeline Sector Sign-in Sheet**

Marion County Multi-Jurisdictional Hazard Mitigation Plan

Sector: Transportation  
Date: 2/29

Name	Organization	Email	Phone Number
Kathy McElasky	Woodburn Transit	Kathleen.McElasky@ci.woodburn.or.us	503-982-5245
Bob Mace	Salem Keizer PS	mace_robert@salkeizer.kiz.or.us	503 399 3072
Kathleen Silva	MC EM	ksilva@co.marion.or.us	503-365-3136
Bill Brownlee	MCPW	BBROWNLEE@COMARION.ORG	503-588-7988
Julie Warncke	Salem PW	jwarncke@cityofsalem.net	503 588 6211
Eric Destral	" "	edestral@cityofsalem.net	" "
Karen Garcia	Salem Keizer Transit	Karen.Garcia@cherrrots.org	503 361 7511
Eric Hlad	MC Sheriff's Office	ehlad@co.marion.or.us	932 3249
Nick Hunter	MC SHERIFF	nhunter@co.marion.or.us	932 - 7481
Jamey Dempster	Oregon DOT Public Transit	james.dempster@dot.state.or.us	503.731.8563
Munier Sinceros	SK Public Services	Sniels-Michael@salkeizer.kiz.or.us	503-399-3100
Jim Thompson	MC Public Works	JThompson@co.marion.or.us	503-559-7972
Regie Stebbins	CITY OF SALEM	RStebbins@CITYOFSALEM.ORG	503 763 3331

**Figure B-4: Water Lifeline Sector Sign-in Sheet**

Sector: Water  
Date: 2/29/16

Name	Organization	Email	Phone Number
Kathleen Silva	MCEM	ksilva@comarion.or.us	503 365 3136
LACEY GOSSES PRIEST	City of Salem	lgosres@cityofsalem.net	503 301 2224
Doug Priest	City of Salem	dpriest@cityofsalem.net	503-589-2193
KEARE BLAYLOCK	MARION COUNTY PW	kblaylock@comarion.us	503-506-4124
Lance Ludwick	City of STAYTON	lludwick@ci.stayton.or.us	503-769-2915
ROGER STEVENSON	CITY OF SALEM	RSTEVENSON@CITYOFSALEM NET	503 763-3331
Rebecca McClain	North Santiam WC	council@northsantiam.org	503 930 8202

Figure B-5: Template Lifeline Sector Meeting Agenda



## Template Lifeline Agenda

**Meeting:** Name  
**Date:** Date  
**Time:** Time  
**Location:** Location

---

- |   |                                  |
|---|----------------------------------|
| <b>I. Optional Refreshments and Mingling</b>  | <b>15 minutes prior to start</b> |
| <b>II. Introduction</b>   | <b>20 minutes</b>                |
| a. Welcome  |                                  |
| b. Purpose and Agenda   |                                  |
| <b>III. Mapping Exercise</b>  | <b>20 minutes</b>                |
| Objective: To set a base geographic knowledge of natural hazard threats and primary infrastructure.   |                                  |
| <b>IV. Scenario Discussions</b>   | <b>90 minutes</b>                |
| Objective: To set a base geographic knowledge of natural hazard threats, primary infrastructure, and interdependencies. To identify sensitivity and impacts of a chronic and catastrophic threats through scenario based thinking followed by discussion. |                                  |
| a. Severe Winter Storm  |                                  |
| b. Earthquake   |                                  |
| <b>V. Wrap-up Questions</b>   | <b>30 minutes</b>                |
| a. From pre-meeting questionnaire   |                                  |
| b. Big picture questions  |                                  |
| <b>VI. Closing and Final Thoughts</b>   | <b>10 minutes</b>                |
| a. Survey   |                                  |
| <b>VII. Flex Time</b>   | <b>10 minutes</b>                |

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Steering Committee Sign-In Sheets

Figure B-6: HMP Steering Committee Sign-in (March 8, 2016)

Name	Organization	Email	Telephone Number
JEFF FOSSHOLM	SILVERTON PD	jfossholm@silverton.or.us	503 874 2228
Kathleen Silva	MCEM	ksilva@co.marion.or.us	503.365.3136
Danielle Gonzalez	Community Services	dgonzalez@co.marion.or.us	503-587-3235
Kris Saltee	Aurora City Council	ksaltee@cityofaurora.or.us	503-678-5168
Kelly Richardson	Aurora City Recorder/Manager	kcrickett@cityofaurora.or.us	503 678-1283
Grant Stevenson	Santion Water Control	grant.stevenson@swcwi.com	503-269-2669
ROGER STAGISAW	CITY OF SALEM	Rstagensaw@cityofsalem.or.us	503 7633331
Jim Ferraris	Woodburn PD	Jim.Ferraris@ci.woodburn.or.us	503-982-1350
Bryan Kirk	MC-PW		
Bryndi Keiser	NW SD	bryndi.keiser34@gmail.com	503-577-0791
Randy Scott	CITY WOODBURN	Randy.Scott@ci.woodburn.or.us	503-980-2427
Dave Swigg	TURK	manager@ctfdurk.com	319-9812
Jason Horton	City of Woodburn	jason.horton@ci.woodburn.or.us	503-982-6076
Michael Johnson	ESSNA	chris@essna-salem.org	503-508-3376
Alex Sebens	Stayton PD	asebens@staytonpd.org	503-769-3423
Matt Knudsen	MC-PW	mknudsen@co.marion.or.us	503 365 3187
Bill Lamy	City of Keizer	Lamy.b@keizer.org	503-390-3700
Jennifer Werner	City of Keizer	Werner.J@keizer.org	503 390-5700
Dianne Hunt	City of Silvertan	dhunt@silvertan.or.us	503-874-2204

Figure B-7: HMP Steering Committee Sign-in (April 27, 2016)

DATE: 4/27/16

NAME	AFFILIATION	EMAIL
Matt Knudsen	Marion County	mknudsen@co.marion.or.us
DAVE HUITT	MARION COUNTY S.O.	dhuitt@co.marion.or.us
DARRECK LOCKARD	AURORA	PWS@ci.AURORA.or.us
Mathias H. Reyes	City of Keizer	reyesm@keizer.or.gov
Jennifer Warner	CITY OF KEIZER	warnerj@keizer.org
Kathleen Silva	MCEM	ksilva@co.marion.or.us
Caitlin Esping	MCEM	cesping@co.marion.or.us
David Sawyer	Turner	msawyer@ci.turner.or.us
Brandon Rich	MCPW	briche@co.marion.or.us
Ed Flick	marion county	eflick@co.marion.or.us
Darren Rice	City of Salem / 911	drice@cityofsalem.net
Ron Charpillar	ESSNA	dcharpillar@gmail.com
Danielle Gonzalez	Marion Co.	dgonzalez@co.marion.or.us

# Steering Committee Meeting Materials



## Agenda

**Meeting:** Marion County Multi-Jurisdictional Hazard Mitigation Plan Steering Committee  
**Date:** March 8, 2016  
**Time:** 2 PM – 4 PM

---

- I. Introductions**
  - a. Name, Agency, Ice Breaker
    - i. What is the most recent hazard to affect your jurisdiction? **15 minutes**
  - b. Program/Department Overview
    - i. Marion County
    - ii. CPW
  
- II. Marion County EM Overview** **20 minutes**
  - a. Ed Presentation
  - b. THIRA
  
- III. Plan Overview** **25 minutes**
  - a. Participating Jurisdictions
  - b. How Plan Will be Used
  - c. What Will the Plan Look Like?
  - d. Timeline
  - e. Role of Steering Committee
  - f. Discussion
  
- IV. Lifeline Sector Analysis and Access and Functional Needs** **65 minutes**
  - a. Purpose
  - b. Preliminary Results/Observations
  - c. Discussion
    - i. What is your immediate reaction to these lifeline analyses?
    - ii. Is there anyone we missed?
    - iii. Of the action items proposed in the lifeline sector meetings, how do you see these moving forward?
  
- V. Next Steps** **5 minutes**
  - a. Tentative Steering Committee Meeting Schedule
  - b. Steering Committee Feedback
  - c. Discussion

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## Agenda

**Meeting:** Marion County Multi-Jurisdictional Hazard Mitigation Plan Steering Committee  
**Date:** April 27, 2016  
**Time:** 1 PM – 4 PM  
**Location:** Oregon Office of Emergency Management (OEM) - Anderson Readiness Center  
 3225 State Street, Salem, OR 97301

---

<b>I. Introductions</b>	<b>10 minutes</b>
a. Check-In Question	
b. Introduce New Members	
<b>II. Plan Status Update</b>	<b>10 minutes</b>
a. Updates Since Last Meeting & Updated NHMP Timeline	
b. Discussion	
<b>III. Hazard History Review</b>	<b>20 minutes</b>
a. Impacts in last 5 years – (flood, wildfire, severe weather, drought, other)	
b. Discussion	
<b>IV. State and County Goals</b>	<b>20 minutes</b>
a. Goals – 2011 NHMP Plan – 7 goals	
b. Recommend Changes Based on State Goals	
c. New goals – (Refer to Handout)	
d. Discussion	
<b>V. Mitigation Action Plan Small Group Activity</b>	<b>75 minutes</b>
a. SMART Action Items Overview	
b. Break Into Small Groups and Review Previous Action Items & Discuss New Action Items and Missing Action Items (Refer to Handout)	
c. Vet our Action Recommendations – Propose and Formulate New Action Items (40 min)	
<b>VI. Reconvene Large Group to Discuss Action Items</b>	<b>30 minutes</b>
a. Discussion	
<b>VII. Assign Homework &amp; Next Steps</b>	<b>15 minutes</b>

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# APPENDIX C: COMMUNITY PROFILE

The following section provides a comprehensive description of Marion County’s assets and context and helps define the county’s sensitivity and resilience to hazards. Known as sensitivity factors, the community assets and characteristics listed in this section are important components and attributes of Marion County, but have varying levels of vulnerability to potential hazards.

Community resilience is defined as a community’s ability to manage risk and adapt to hazards. This includes government structure, agency missions and directives, and plans, policies, and programs. The information documented in this section, along with the hazard assessments located in Volume I, Section 2, is intended to support the risk reduction actions identified in Volume I, Section 3 – Mission, Goals, and Action Items.

**Figure C-1 Understanding Risk**



Source: Oregon Partnership for Disaster Resilience

## Geography and Climate

Marion County is located in northwest Oregon, covering over 1,000 square miles. The county has a diverse geography, ranging from the rainy Willamette Valley in the west to the Breitenbush Hot Springs in the east. The western half of the county, located in the Willamette Valley, is relatively flat. The eastern portion of the county has a mountainous topography and is bordered by the Cascade Mountain Range. The average elevation for Marion County is 154 feet and elevations range from 100 feet near the Willamette River to 2400 feet in the foothills of the Cascade

Mountains<sup>1</sup>. Forestland covers almost half of the eastern portion of the county and a majority of the water resources originate in this area<sup>2</sup>.

Marion County spans a wide range of physiographic regions; thus, there is considerable variation in precipitation, with elevation as the largest factor in the amount of total precipitation. Marion County has a modified marine climate where winters are cool and wet, while summers are moderately warm and dry<sup>3</sup>.

**Table C-I Average Rainfall and Temperatures**

Ecoregion	Mean Annual Rainfall Range (inches)	Mean Temperature Range (°F) January min/max	Mean Temperature Range (°F) July min/max
<b>Willamette Valley</b>			
Gallery Forest	40-50	33/46	50/85
Prairie Terraces	40-50	33/46	51/85
Valley Foothills	45-60	32/46	50/80
<b>Cascades</b>			
Western Cascades Lowlands and Valleys	60-90	31/41	47/48
Western Cascades Montane Highlands	70-120	16/37	44/75
Cascade Crest Montane Forest	55-100	21/35	43/72
Cascae Subalpine/Alpine	75-140	16/31	38/65

Source: US EPA. Ecoregions of Oregon

From 1971 to 2000, the average annual precipitation in Marion County was approximately 40 inches, with the least amount of precipitation on the Willamette Valley floor, and greater amounts near the foothills of the Cascade Range<sup>4</sup>. Figure 2.2 shows the average annual precipitation in Marion County.

---

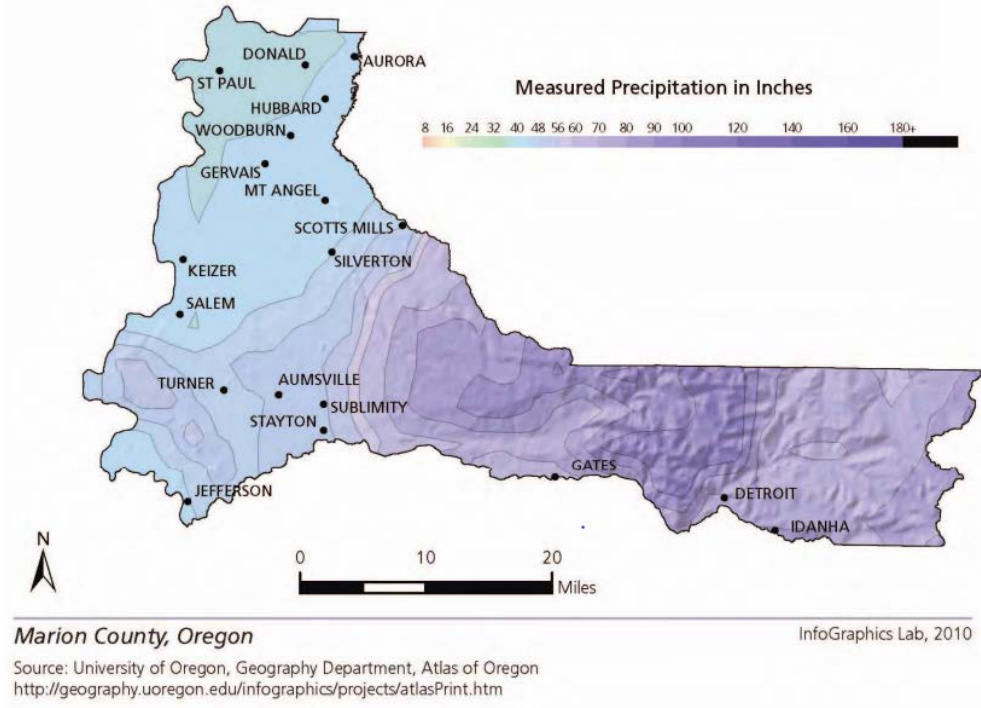
<sup>1</sup> Pringle, Glenn-Gibson, Claggett and Mill Creeks Watershed Assessment. January 2002

<sup>2</sup> Marion County Comprehensive Plan, 2002

<sup>3</sup> Northwest River Forecast Center

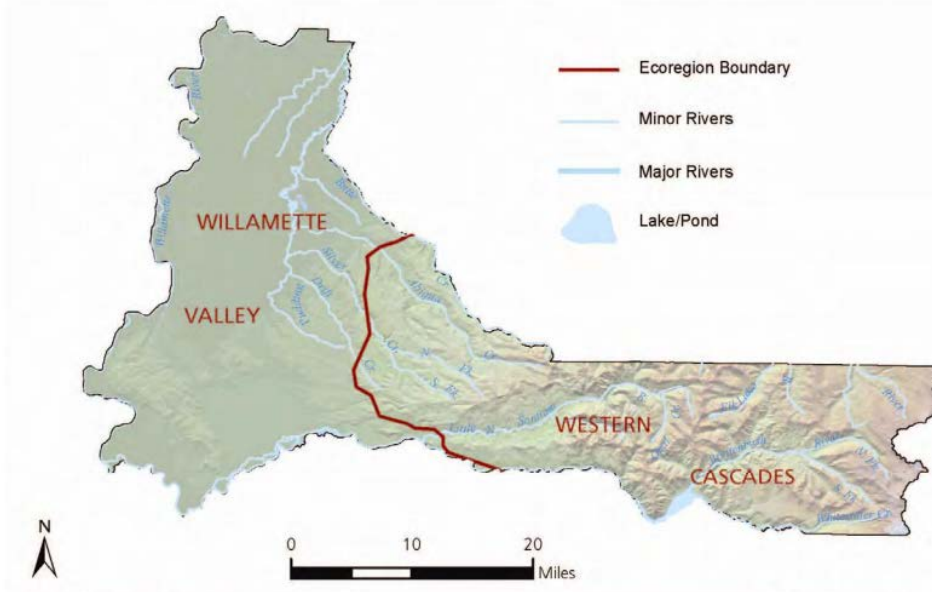
<sup>4</sup> Atlas of Oregon. 2002. University of Oregon Press

**Figure C-2 Marion County Average Annual Precipitation**



Several rivers are located in Marion County, including the Willamette River, North Santiam River, Pudding River, Little Pudding River, and Mill Creek. The largest reservoir in Marion County is Detroit Reservoir, which is 50 miles east of Salem on the North Santiam River and covers 5.6 miles. The rivers and their sub-basins are depicted in Figure 2.3 and 2.4 below.

**Figure C-3 Marion County Physiography**

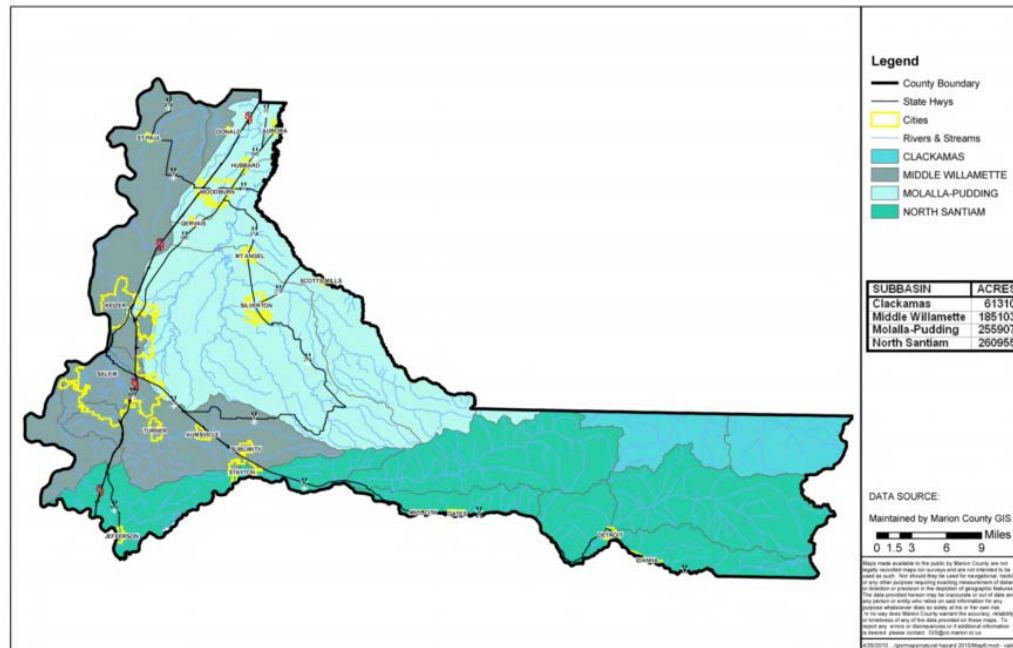


Marion County, Oregon

InfoGraphics Lab, 2010

Source: University of Oregon, Geography Department, Atlas of Oregon  
<http://geography.uoregon.edu/infographics/projects/atlasPrint.htm>, Oregon Geospatial Enterprise Office (GEO),  
<http://www.oregon.gov/DAS/EISPD/GEO/alphalist.shtml>

**Figure C-4 River Sub-Basins in Marion County**



## Population and Demographics

Marion County is the fifth most populous county in Oregon. The county's population has steadily increased by just over 15 percent between 2000 and 2015.

In 2015, the Marion County population was recorded at 329,770 residents.<sup>5</sup> Keeping in line with Oregon’s overall population growth, Marion County is estimated increase their number of residents to 410,500 by the year 2030.<sup>6</sup> Should this growth continue, it is essential for Marion County to have guidelines and policies in place that ensure growth does not occur in hazardous areas.

**Table C-2 Population Estimate and Forecast for Marion County Cities**

Jurisdiction	2000		2010		2015		Population Change 2000-2015		Average Annual Growth Rate
	Population	Percent of County	Population	Percent of County	Population	Percent of County	Population Change	Percent Change	
Aumsville	3,003	1.1%	3,625	1.1%	3,945	1.2%	942	26.0%	2.0%
Aurora	655	0.2%	980	0.3%	950	0.3%	295	30.1%	2.7%
Detroit	262	0.1%	275	0.1%	210	0.1%	-52	-18.9%	-1.6%
Donald	625	0.2%	1,040	0.3%	980	0.3%	355	34.1%	3.3%
Gates (part)*	429	0.2%	455	0.1%	442	0.1%	13	2.9%	0.2%
Gervais	2,009	0.7%	2,260	0.7%	2,555	0.8%	546	24.2%	1.7%
Hubbard	2,483	0.9%	3,140	1.0%	3,225	1.0%	742	23.6%	1.9%
Idanha (part)*	147	0.1%	145	0.0%	78	0.0%	-69	-47.9%	-4.5%
Jefferson	2,487	0.9%	2,670	0.8%	3,165	1.0%	678	25.4%	1.7%
Keizer	32,203	11.3%	36,295	11.3%	36,985	11.2%	4,782	13.2%	1.0%
Mill City (part)*	312	0.1%	330	0.1%	299	0.1%	-13	-4.0%	-0.3%
Mt. Angel	3,121	1.1%	3,825	1.2%	3,410	1.0%	289	7.6%	0.6%
St. Paul	354	0.1%	415	0.1%	425	0.1%	71	17.1%	1.3%
Salem (part)*	119,040	41.8%	133,883	41.8%	135,148	41.0%	16,108	12.0%	0.9%
Scotts Mills	312	0.1%	300	0.1%	365	0.1%	53	17.7%	1.1%
Silverton	7,414	2.6%	9,655	3.0%	9,590	2.9%	2,176	22.5%	1.9%
Stayton	6,816	2.4%	7,815	2.4%	7,725	2.3%	909	11.6%	0.9%
Sublimity	2,148	0.8%	2,130	0.7%	2,755	0.8%	607	28.5%	1.8%
Turner	1,199	0.4%	1,760	0.5%	1,920	0.6%	721	41.0%	3.4%
Woodburn	20,100	7.1%	23,150	7.2%	24,670	7.5%	4,570	19.7%	1.5%
Sub-Total	205,119	72.0%	234,148	73.0%	238,841	72.4%	4,693	2.3%	0.5%
Unincorporated	79,719	28.0%	86,492	27.0%	90,929	27.6%	11,210	14.1%	0.9%
Marion Total	284,838	100%	320,640	100%	329,770	100%	44,932	15.8%	0.7%

Source: Portland State University, Population Research Center, "Annual Population Estimates", 2014.

\* The majority of Albany’s population is within Linn County.

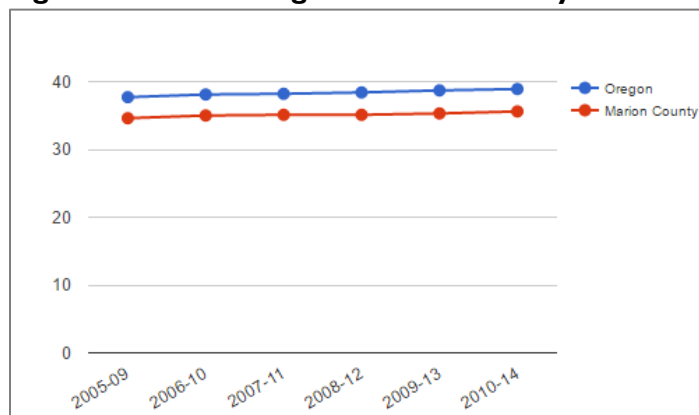
Marion County has a slightly younger population than the State of Oregon as a whole. Since 2005, the average age of Marion County residents is roughly 35, three years younger than the average resident in the State of Oregon.<sup>7</sup>

<sup>5</sup> Portland Research Center, Portland State University, 2015 Certified Oregon Population Estimates

<sup>6</sup> Population Research Center at the Portland State University College of Urban and Public Affairs. Population Forecasts for Marion County, its Cities and Unincorporated Area 2010-2030. 2008. Incorporated herein by reference.

<sup>7</sup> U.S. Census Bureau, American Community Survey

**Figure C-5 Median Age of Marion County Residents**



Source: U.S. Census Bureau, American Community Survey

From 2000 to 2008, the age group under five increased by 14 percent, the 55-59 age group increased by 51 percent, the 60-64 age group increased by 54 percent, and the 85 and over age group increased by 46 percent.<sup>8</sup>

Those under five are particularly vulnerable to natural hazards, as well as residents who are 85 years and older. Moreover, while residents between the ages of 55 and 64 are not currently vulnerable to potential hazards, this large cohort will be far more susceptible in the next five to ten years. Therefore, it is imperative for Marion County to have policies in place that protect both young and old residents, as well as encourage them to prepare for potential hazards. Historically, 80 percent of the burden to prepare and anticipate for disasters falls upon the public<sup>9</sup>.

This burden is disproportionately placed upon those with intellectual and/or physical disabilities, particularly children, the elderly, children, people of color, and low-income families and individuals. As shown below in Table 1, 22 percent of Marion County's population is between the ages of 0 and 14. In general, children are more vulnerable to extreme weather, have fewer transportation options, and require assistance to access medical help and assistance. Furthermore, a little over 11 percent of residents under the age of 65 have a disability, which may lead to fewer transportation options, limited access to medicine or medical assistance, mobility impairment, and more<sup>10</sup>.

In addition, 12 percent of the population is considered elderly (over 65 years of age). Elderly individuals may require special consideration due to sensitivities to extreme weather, accessibility to medical care and medications, mobility impairment, and comparative difficulty in making home modifications that reduce risk to hazards. Addressing the needs of vulnerable groups through hazard mitigation is important to improve the community's overall resilience to natural hazards.

<sup>8</sup> U.S. Census Bureau, Table P12 Marion County Population By Age, 2000, 2008

<sup>9</sup> Hazards Workshop Session Summary #16, Disasters, Diversity, and Equity. July 2000). University of Colorado, Boulder.

<sup>10</sup> U.S. Census Bureau, American Community Survey 2010-2014

## Employment and Economic Capacity

Economic capacity refers to the financial resources and revenue within a community that provide a higher quality of life for residents. Income equality, housing, affordability, economic diversification, employment and industry are all 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 employment sectors, workforce, resources and infrastructure are interconnected within the existing economic picture.

## Regional Affordability

The evaluation of regional affordability supplements the identification of socio-demographic capacity indicators (like median income) and is a critical tool for analyzing the economic status of a community. This information captures the likelihood of individuals' ability to prepare for hazards, such as retrofitting homes or purchasing insurance. If a community has high income inequality or housing cost burden levels, the potential for home-owners and renters to implement mitigation is drastically reduced. Therefore, regional affordability is a mechanism for generalizing the abilities of community residents to get back on their feet without significant public assistance.

## Median Family Income and Poverty Status

As seen in the table below, the median family income for Marion County residents in 2014 was \$47,360. While income levels throughout the United States have yet to recover from the great recession, Marion County is still approximately \$6,000 below the national average of \$53,647.<sup>11</sup> The table also shows significant variability in post-recession income gains and losses across Marion County cities. While some cities such as Turner, Aumsville, Donald and Detroit have seen good to modest gains in Median income, most other cities have lost ground. Eight of Marion County's 20 cities have seen double digit reductions in median income since 2010. These data illustrate the unevenness of the economic recovery at the local level. Hazard mitigation activities will be increasingly challenging in these communities where basic needs trump other "discretionary" spending.

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<sup>11</sup> U.S. Census, American Community Survey 2014

**Table C-3 Median Family Income for Marion County Cities**

Jurisdiction	Median Household Income			Percent Change
	2010	2010 Adj Inf*	2014	
Marion	\$ 46,069	\$ 50,015	\$ 47,360	-5.6%
Aumsville	\$ 39,650	\$ 43,046	\$ 50,319	14.5%
Aurora	\$ 77,784	\$ 84,447	\$ 72,656	-16.2%
Detroit	\$ 38,750	\$ 42,069	\$ 45,000	6.5%
Donald	\$ 53,512	\$ 58,096	\$ 63,015	7.8%
Gates (part)*	\$ 37,679	\$ 40,907	\$ 36,250	-12.8%
Gervais	\$ 45,392	\$ 49,280	\$ 51,172	3.7%
Hubbard	\$ 45,607	\$ 49,514	\$ 48,479	-2.1%
Idanha (part)*	\$ 48,125	\$ 52,247	\$ 33,438	-56.3%
Jefferson	\$ 43,108	\$ 46,801	\$ 45,781	-2.2%
Keizer	\$ 51,894	\$ 56,339	\$ 50,897	-10.7%
Mill City (part)*	\$ 35,673	\$ 38,729	\$ 37,472	-3.4%
Mt. Angel	\$ 42,924	\$ 46,601	\$ 41,984	-11.0%
St. Paul	\$ 59,438	\$ 64,529	\$ 64,063	-0.7%
Salem (part)*	\$ 43,770	\$ 47,519	\$ 46,273	-2.7%
Scotts Mills	\$ 44,583	\$ 48,402	\$ 42,292	-14.4%
Silverton	\$ 49,484	\$ 53,723	\$ 53,929	0.4%
Stayton	\$ 44,698	\$ 48,527	\$ 41,432	-17.1%
Sublimity	\$ 60,909	\$ 66,126	\$ 53,611	-23.3%
Turner	\$ 41,875	\$ 45,462	\$ 52,674	13.7%
Woodburn	\$ 42,519	\$ 46,161	\$ 43,144	-7.0%

\*Dollars adjusted to 2014 at 1.08566

Source: U.S. Census Bureau (n.d.). 2006-2010 & 2009-2013 American Community Survey - 5 year estimates.

Moreover, 43 percent of Marion County households with children under the age of 18 receive public assistance benefits and almost 30 percent of those households are below the poverty level. County residents below the poverty level make up nine-percent of Oregon's overall poverty rate, outranked only by Multnomah, Lane, and Washington counties. While only 2.2 percent of Oregonians receive TANF, almost four percent of Marion County residents receive TANF benefits, making up 12 percent of Oregon's overall recipients. The only county that receives more TANF benefits per resident is Multnomah County, which makes up 24 percent of state recipients. Yet, it is important to emphasize that Multnomah County has almost 800,000 residents, which is over double that of Marion County (323,614 residents).<sup>12</sup>

Marion County also faces significant poverty among people of color, in which the poverty rate dramatically rises to 29 percent. Outranking Lane and Clackamas counties, Marion County makes up 12 percent of Oregon's overall poverty rate among people of color.

<sup>12</sup> U.S. Census, American Community Survey 2014



Three percent of students enrolled in Marion County schools are homeless, making up almost eight percent of the statewide percentage of homeless students.

## Housing Affordability

Housing affordability is a measure of economic security gauged by the percentage of an area's households paying less than 35% of their income on housing.<sup>13</sup>

Households spending more than 35% of their monthly income on rent or their mortgage are considered housing cost burdened.

For every affordable and available unit available in Marion County, there are 16 extremely low-income (ELI) households that rent. This is below the state average of 21 affordable and available units per ELI renter household.<sup>14</sup>

Of the 46,033 households that rent in Marion County, 11,901 spend 50 percent or more of their income on rent. A little less than half of renter households in Marion County are considered rent burdened (20,084 households), or roughly 44 percent.

In general, the population that spends more of their income on housing has proportionally fewer resources and less flexibility for alternative investments in times of crisis.<sup>15</sup> This disparity imposes challenges for a community recovering from a disaster as housing costs may exceed the ability of local residents to repair their home or move to a new location. 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 struggles experienced by individual residents and families.

## Economic Diversity

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 individual 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 Oregon 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. Marion County ranks extremely high on this index, with an economy that is considered the third most diverse out of the 36 counties evaluated.

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<sup>13</sup> University of California Berkeley. Building Resilient Regions, Resilience Capacity Index. <http://brr.berkeley.edu/rci/>.

<sup>14</sup> Oregon Housing and Community Services: LIFT Housing Program Policy Subcommittee, Available Data from OHCS and DHS, Presented October 14, 2015.

<sup>15</sup> Ibid.

**Table C-I Regional Herfindahl Index Scores**

County	2008			2013		
	Employment	Number of Industries	State Rank	Employment	Number of Industries	State Rank
Benton	26,433	199	23	25,247	201	21
Lane	123,008	260	4	114,670	260	5
Lincoln	14,286	183	29	13,491	179	30
Linn	36,360	225	5	33,934	222	4
Marion	105,758	252	3	101,571	245	3
Polk	12,837	178	18	12,179	167	9
Yamhill	27,797	209	9	27,860	209	6

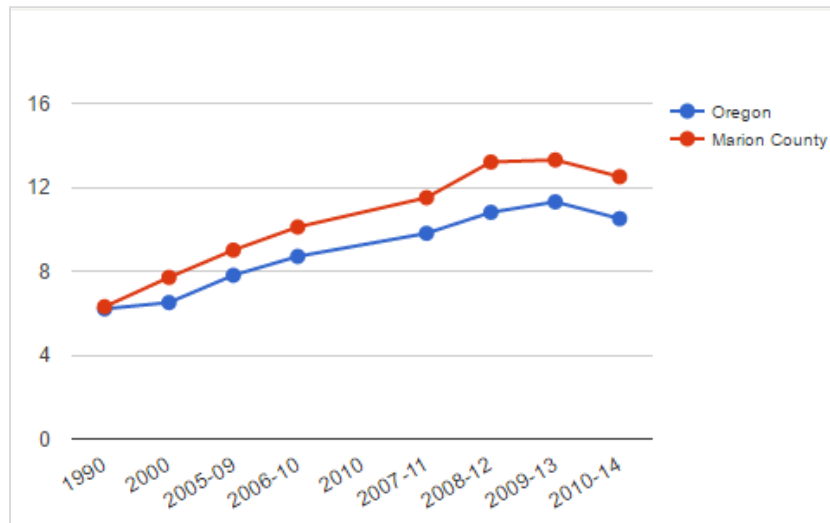
Source: Oregon Employment Department

While illustrative, economic diversity is not a guarantor of economic vitality or resilience. Marion County, as of 2016, is still listed as an economically distressed community as prescribed by Oregon Law (ORS 123.024). The economic distress measure is based on indicators of decreasing new jobs, average wages and income, and is associated with an increase of unemployment.<sup>16</sup>

## Employment and Wages

According to the Oregon Employment Department, unemployment has increased since 2010 and remains an average of 2 percent higher than the rate for Oregon.

**Figure C-5 County and State Unemployment 1990-2014**



Source: U.S. Census Bureau, American Community Survey

<sup>16</sup> Business Oregon – Oregon Economic Data “Distressed Communities List”

# Industry

Key industries are those that represent major employers and are significant revenue generators. Different industries face distinct vulnerabilities to natural hazards, which can impact the resiliency of certain sectors and the overall economy of a region. Identifying key industries in the region enables communities to target mitigation activities towards that industry's specific sensitivities.

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 and bring revenue into a local community via employment. Agriculture, information and technology, 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, 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, the impact is 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.

The table below identifies employment by industry. The top five industry sectors in Marion County with the most employees, as of 2014, are Managerial, Professional (30 percent); Sales and Office (24 percent); Education, Health, and Social Services (30 percent); Service (20 percent); and Production and Transport (13 percent).

While Marion County has some basic industries, such as natural resources and mining and manufacturing, none of their five largest employers are basic sector industries. Therefore, Marion County's economy is very dependent on local sales and revenue. The three sectors with the highest revenue were Retail Trade, Health Care and Social Assistance and Wholesale Trade. The table below shows the revenue generated by each economic sector (Note: not all sectors are reported). Together, these three sectors generate more than \$10 billion in annual revenue for the county.

**Table C-5 Employment Sectors and Revenue 2012**

Sector Meaning (NAICS code)	Sector Revenue (\$1,000)	Percent of Total Revenue
Manufacturing	\$ 2,540,329	16.6%
Wholesale trade	\$ 3,190,000	20.8%
Retail trade	\$ 3,862,230	25.2%
Transportation and warehousing (104)	\$ 537,598	3.5%
Real estate and rental and leasing	\$ 269,711	1.8%
Professional, scientific, and technical services	\$ 448,352	2.9%
Administrative and support and waste management and remediation services	\$ 318,626	2.1%
Accommodation and food services	\$ 18,054	0.1%
Health care and social assistance (62)	\$ 3,573,934	23.3%
Arts, entertainment, and recreation (71)	\$ 138,624	0.9%
Other services (81)	\$ 431,400	2.8%
<b>Total</b>	<b>\$ 15,328,858</b>	<b>100%</b>

Source: U.S. Census Bureau, 2012 Economic Census, 2012 Economic Census of Island Areas, and 2012 Nonemployer Statistics.

In the event that any of these primary sectors are impacted by a disaster, Marion County may experience a significant disruption of economic productivity. 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. As education and social services, state government and public administration, and manufacturing are key to post-disaster recovery efforts, a region is bolstered by its key employment sectors. It is important to consider what might happen to the county economy if the largest revenue generators and employers are impacted by a disaster. Areas with high income equality, increased housing costs, and low economic diversity are factors that may contribute to slower recovery from a disaster.

## Land Use and Development Patterns

Marion County is the fifth-most populous county in Oregon and contains the state capital, Salem, which is also the county seat. The county was originally named the Champooick District, after a meeting place on the Willamette River known as Champoeg. This meeting place refers to the Kalapuyan word for yampah (an important staple crop of Native Americans on the West coast of North American). In 1849, the legislation governing the growing territory renamed the county in honor of General Francis Marion, a native of South Carolina who served in the American Revolutionary War.

Marion County has the unique distinction of being one of the first districts of the Oregon Country, along with Twality (now Washington County), Clackamas, and Yamhill counties.

The vast majority of Marion County is forestland, with smaller areas of agricultural lands. Forested lands are located along the western portion of the county, while the eastern portion of the county has a dry, Mediterranean climate. Agriculture is concentrated throughout the flat regions of the Willamette Valley. Cities and rural residential areas are heavily concentrated along the many rivers, creeks, and lakes that make up the county. Local and state policies currently direct growth away

from rural lands into Urban Growth Boundaries and, to a lesser extent, into rural communities. Within the rural areas, development radiates outward from the urban areas along rivers in a pattern that is likely to continue.

## Regulatory Context

Oregon land use laws require land outside Urban Growth Boundaries (UGBs) to be protected for farm, forest, and other resources. For the most part, this law limits the amount of development in rural areas. However, the land use designation can change from resource protection in one of two ways:

- The requested change could qualify as an exception to Statewide Planning Goals, in which case the city or county must demonstrate to the State that the change meets requirements for an exception. These lands, known as exception lands, are predominantly designated for residential use.
- Resource land can also be converted to non-resource use when a city or county demonstrates that the land is no longer suitable for farm or forest production.

Local and state policies currently direct growth away from rural lands into UGBs, and, to a lesser extent, into rural communities. If development follows historical development trends, urban areas will expand their UGBs, while rural unincorporated communities will continue to grow and overall rural residential density will increase slightly. However, the bulk of rural lands will remain in farm and forest use. The existing pattern of development in the rural areas, which is radiating out from the urban areas along rivers and streams, is likely to continue. Most of the “easy to develop” land is already developed, in general leaving more constrained land such as land in the floodplains or on steep slopes to be developed in the future, perhaps increasing the rate at which development occurs in natural hazard areas.

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 county and city 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.

### Goal 7

Goal 7: Areas Subject to Natural Disasters and Hazards intends 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:

- a) frequency, severity, and location of the hazard;
- b) effects of the hazard on existing and future development;
- c) potential for development in the hazard area to increase the frequency and severity of the hazard; and
- d) types and intensities of land use 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 Goal 7 for coastal and ravine flood hazards by adopting and implementing local floodplain regulations that meet the minimum National Flood Insurance Program (NFIP) requirements.

In adopting plan policies and implementing measures for protection from hazards local governments should consider:

- a) the benefits of maintaining hazard areas as open space, recreation, and other low density uses;
- b) the beneficial effects that hazards can have on natural resources and the environment; and
- c) 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 prevention, protection, mitigation, response, and recovery programs. Given the numerous waterways and forested lands throughout Marion County, special attention should be given to problems associated with river bank erosion and potential for wildland/ urban interface fires.

Goal 7 also guides local governments in evaluating emergency access when considering development in identified hazard areas, including:

- a) Considering programs to manage storm water runoff as a means to address flood and landslide hazards;
- b) Using non-regulatory approaches to help implement the goal;
- c) When reviewing development requests in high hazard areas, requiring site specific reports, appropriate for the level and type of hazards. Site specific reports should evaluate the risk to the site, as well as the risk the proposed development may pose to other properties; and
- d) Adopting measures exceeding the requirements of the National Flood Insurance Program.

# Housing

Housing type and age are important factors in hazard mitigation planning. Certain housing types tend to be less disaster resistant and warrant special attention. Mobile homes, for example, are generally more prone to wind and water damage than standard wood-frame construction. Homes built before 1993 may also be more vulnerable to earthquakes because they were built prior to the incorporation of strict earthquake standards in Oregon's building codes. Structures built in Oregon after 1993 use earthquake resistant designs and construction techniques<sup>17</sup>. Additionally, in the 1970s, the Federal Emergency Management Agency (FEMA) began assisting communities with floodplain mapping and communities passed floodplain ordinances to regulate floodplain development.

Marion County has a variety of different housing types. In 2014, 63.3 percent were detached single family homes and 18 percent were multifamily. Eight percent of county residents live in mobile homes and less than one percent live in boats, RV, vans, or other forms of housing. Of these housing types, 68 percent were built prior to 1990 and therefore are not built to current earthquake standards<sup>18</sup>. Residents of Marion County who live in mobile homes are particularly vulnerable to natural hazards such as floods, earthquakes, and windstorms because they may not be secured by a foundation. Given the large percentage of County individuals and families who reside in mobile homes, public education and outreach efforts should be targeted to these groups.

In 2014, Marion County had 121,706 housing units. Of those, 6.4 percent were vacant (7,823 units). Almost 60 percent of units are owner occupied (67,850 units) and 40 percent are occupied by renters (46,033 units)<sup>19</sup>. Typically, renters are less likely than homeowners to prepare for natural hazard events. Renters are likely to have higher turnover rate, which limits their exposure to public education and outreach around hazards. This is exacerbated by the lack of targeted education and outreach on behalf of preparedness campaign that focuses specifically on renters, despite Marion County having almost equal numbers of renters and homeowners. Moreover, renters tend to have lower incomes and fewer resources to prepare for natural disasters, as well as a lack of capacity or knowledge to invest in or request mitigation measures for rented property.

## Critical Facilities

Critical facilities are those facilities that are essential to government response and recovery activities (e.g., hospitals, police, fire and rescue stations, school districts

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<sup>17</sup> Wang Yumei and Bill Burns. "Case History on the Oregon Go Bond Task Force: Promoting Earthquake Safety in Public Schools and Emergency Facilities." National Earthquake Conference. January 2006.

<sup>18</sup> U.S. Census Bureau, "Selected Housing Characteristics: 2010-2014 American Community Survey 5-Year Estimates," American Community Survey

<sup>19</sup> U.S. Census Bureau, "Selected Housing Characteristics: 2010-2014 American Community Survey 5-Year Estimates," American Community Survey

and higher education institutions). The interruption or destruction of any of these facilities would have a debilitating effect on incident management.

Critical facilities in Marion County are identified within the Risk Assessment, which can be found in Section 2 or in the Lifeline Sector summaries in Appendix D.

## **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 are 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 they reflect the specific needs and composition of each community's 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. When planning for 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 in a plan involve communicating with the public or specific subgroups of a population (e.g. elderly, children, low income, etc.). The County can use existing social systems as resources for implementing public education and outreach because these service providers typically have existing relationships with members of the public. While the presence of these services is predominantly in urbanized areas of the county, this is synonymous with the general urbanizing trend of local residents.

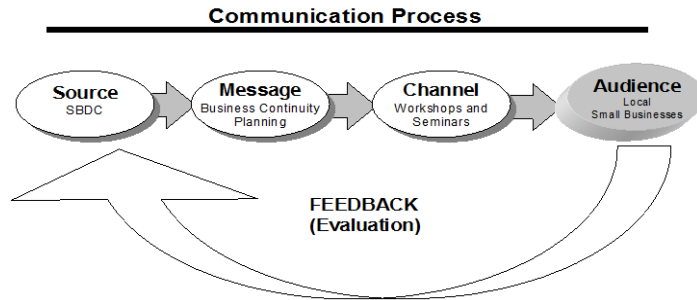
The following is a brief explanation of how the communication process works and how the community's existing social service providers could be used to provide hazard related messages to their clients.

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-6 Communication Process**



Source: Adapted from the U.S. Environmental Protection Agency Radon Division's outreach program

Three potential methods for public involvement include:

- Education and outreach – organization could partner with the community to educate the public or provide outreach assistance on 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.

## Civic Engagement

Civic engagement and involvement in local, state and national politics are important indicators of community connectivity. Those who are more invested in their community may have a higher tendency to vote in political elections. The 2012 Presidential General Election resulted in an average 75% voter turnout in the county as of November 16<sup>th</sup>, 2012.<sup>20</sup> These results are slightly lower than voter participation reported across the State (82.8%).<sup>21</sup> Other indicators such as volunteerism, participation in formal community networks and community charitable contributions are examples of other civic engagement that may increase community connectivity.

## Cultural Resources

### Historic Places

Historic and cultural resources, such as historic structures and landmarks, help to define a community and potentially create tourism-related revenue. Protecting these resources from the impact of disasters is important because they have an important role in defining and supporting the community. According to the National Register Bulletin, "a contributing resource is a building, site, structure, or

<sup>20</sup> Oregon Secretary of State, Election Statistics: Voter Registration and Election Participation

<sup>21</sup> Oregon Blue Book, Voter Participation. <http://bluebook.state.or.us/state/elections/elections04.htm>

object adds to the historic associations, historic architectural qualities, or archeological values for which a property is significant because it was present during the period of significance, related to the documented significance of the property, and possesses historical integrity or is capable of yielding important information about the period; or it independently meets the National Register criteria.”<sup>22</sup> If a structure does not meet these criteria, it is considered to be non-contributing.

There are 201 eligible/significant (ES) historical sites and 1,685 eligible/contributing historical sites in Marion County. Overall, there are a total of 1,886 historical sites in Marion County.

## Libraries and Museums

Libraries and museums develop cultural capacity and community connectivity because they are places of knowledge and recognition, have common spaces for the community to gather, and help maintain a sense of community during a disaster. They are recognized as safe places and reflect normalcy in times of distress.

## Cultural Events

Other such institutions that can strengthen community connectivity are the presence of festivals and organizations that engage diverse cultural interests. These events bring revenue into the community and have the potential to both improve cultural competence and enhance a sense of place and identity. Cultural connectivity is important to community resilience, as people may be more inclined to remain in an area if they feel part of the community and culture.

## Community Stability

### Residential Geographic 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 using other supports for economic or social challenges.<sup>23</sup> Fifty-five percent of Marion County residents have moved within the last five years, which makes it difficult to conduct public outreach and stay in contact with residents. While this is only 2 percent above the statewide average, it demonstrates that Marion County is an area that shifts rapidly and lacks population stability. Therefore, having public education and outreach strategies that can meet these needs is essential.

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<sup>22</sup> U.S. Department of the Interior, National Park Service, Cultural Resources, National Register Bulletin 16A: "How to Complete the National Register Registration Form".

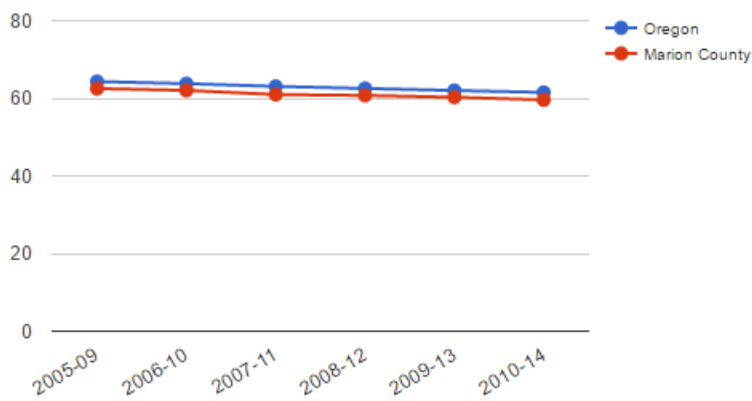
<sup>23</sup> Cutter, Susan, Christopher Burton, Christopher Emrich. "Disaster Resilience Indicators for Benchmarking Baseline Conditions". *Journal of Homeland Security and Emergency Management*.

## Homeownership

Housing tenure describes whether residents rent or own the housing units they occupy. Homeowners are typically financially stable but are at risk of greater property loss after a disaster event. People may rent because they choose not to own, lack the financial resources necessary, or are transient.

Collectively, about 59.5 percent of the occupied housing units in Marion County are owner-occupied and 33 percent is renter occupied. A little less than 7 percent of Marion County's homes are vacant. In addition, seasonal or recreational housing accounts for approximately a little over 1 percent of housing units, which is below the Oregon average of 3.5 percent.<sup>24</sup>

**Figure C-7 Housing Ownership Rate**



Source: U.S. Census Bureau, 2010-2014 American Community Survey

Wealth increases resiliency and recovery from disasters. Renters typically 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 hazards.<sup>25</sup> In the most extreme cases, renters lack sufficient shelter options when lodging becomes uninhabitable or unaffordable post-disaster.

Marion 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, is essential to preserving community cohesion and identity. The presence of larger communities makes additional resources and services available to the public. However, it is important to consider that these amenities may not be equally distributed to the rural portions of the county, which produces implications for recovery in the event of a disaster.

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<sup>24</sup> U.S. Census Bureau, 2010-2014 American Community Survey

<sup>25</sup> Cutter, S. L. (2003). Social Vulnerability to Environmental Hazards. *Social Science Quarterly*.

In the long-term, it may be of specific interest to the county to evaluate community stability. A community experiencing instability and low homeownership may hinder the effectiveness of response and recovery mechanisms.

## 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 government and non-government entities to collaborate; as disaster losses stem from a predictable result of interactions between the physical environments, social and demographic characteristics, and the built environment.<sup>26</sup> Resilient political capital seeks to involve various stakeholders in hazard planning and works towards integrating the Hazards Mitigation Plan with other community plans, so that all planning approaches are consistent.

## Government Structure

Marion County's governing jurisdiction includes all unincorporated areas that are not governed by U.S. Forest Service, Bureau of Land Management, and state owned land. Marion County has three (3) elected County Commissioners, as well as an elected sheriff and district attorney. County departments and divisions consist of the following:

**Administrative Service:** serves citizen needs by providing election services, recording property documents, collecting property taxes, issuing marriage and dog licenses, and engaging the community to make Marion County a healthy environment for children and families. Administrative Services supports the internal county organization by providing business support services including payroll and accounting, information technology, budget development and oversight, and human resources services.

**Assessment:** responsible for assessing all properties in Marion County. The assessment department is also responsible for maps, property information, and special tax exemption designations.

**Community Development:** ensures that the building and land use laws of the state of Oregon and Marion County are followed in a fair and equitable manner. A one-stop permit service coordinates the issuance of permits for other county departments involved in development activities. The community development department also maintains the county Flood Insurance Rate Maps (FIRM), which are used in determining vulnerability and risk of flood.

**Health Department:** works to create and sustain the conditions in which all people in the community can be healthy. To that end, public health serves three core functions: to assess the health status of the entire population, to advise policy development, and to ensure that adequate, competent services are available throughout the community.

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<sup>26</sup> Mileti, D. 1999. *Disaster by Design: a Reassessment of Natural Hazards in the United States*. Washington D.C.: Joseph Henry Press.

**Natural Areas and Parks:** serves the interests and pursuits of Marion County residents by providing access to natural, historic, and recreational areas and conserving, restoring and developing parkland investments.

**Public Works:** responsible for keeping the community accessible, safe, and environmentally responsible by providing citizens with efficient road and transportation systems, rural utility services, public facilities and land use services.

Incorporated communities have the following government structures as illustrated in the table below.

## 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.<sup>27</sup>

The Marion County Hazards Mitigation Plan includes a range of recommended action items that, when implemented, will reduce the county's vulnerability to 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 Hazards Mitigation Plan helps identify what resources already exist that can be used to implement the action items identified in the plan. Implementing the 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. In addition to the plans listed below the county and incorporated cities also have zoning ordinances (including floodplain development regulations) and building regulations.

Marion County's current plans and policies include the following:

### Marion County Comprehensive Plan

- **Date of Last Revision:** 2010
- **Author/ Owner:** Marion County
- **Description:** The Comprehensive Plan is the official policy guide for decisions about growth, development, and conservation of natural resources in Marion County.
- **Relationship to Natural Hazard Mitigation Planning:** The Goal 7 Policies within Marion County's Comprehensive Plan are limited at best. The plan does not contain a specific section dedicated to natural hazards. Where they exist, hazard policies can provide the framework for evaluating land use actions for their exposure to potential harm from natural hazards. The policies can guide the identification of areas subject to natural hazards,

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<sup>27</sup> Burby, Raymond J., ed. 1998. Cooperating with Nature: Confronting Natural Hazards with Land-Use Planning for Sustainable Communities.

regulation of development in those areas, and protection of citizens, property and the environment from the effects of natural hazards. The protection methods prescribed by such policies include prevention and preparedness, land use regulation, use of natural systems to mitigate hazards, public education, and collaboration with other organizations. Such policies can also guide development of this natural hazards mitigation plan. Likewise, the risk assessment and mitigation action items identified within this natural hazards mitigation plan should also influence the comprehensive plan's findings and land use policies.

#### Marion County Community Wildfire Protection Plan

- Date of Last Revision: 2016 revision in process
- Author/ Owner: Marion County Fire Defense Board, Oregon Department of Forestry, and Marion County Emergency Management
- Description: The mission of the Community Wildfire Protection Plan (CWPP) is to make Marion County residents, businesses, and resources less vulnerable to the negative effects of wildland fires. The vision of the CWPP is to promote awareness of the countywide wildland fire hazard and propose workable solutions to reduce the wildfire potential.
- Relationship to Hazard Mitigation Planning: The Community Wildfire Protection Plan (CWPP) is intended to be adopted for incorporation within the Marion County Hazards Mitigation Plan. The CWPP contains goals and actions that seek to minimize the county's risk to wildfire hazards.

#### Marion County Emergency Management – Emergency Operations Plan

- Date of Last Revision: 2016 revision in process
- Author/ Owner: Marion County
- Description: The Marion County Emergency Operations Plan (EOP) is based on a thorough analysis of the natural and human-made hazards that could affect the county. This analysis is the first step in planning for mitigation, response, and recovery actions. The method used in this analysis provides a sense of hazard priorities, or relative risk. It does not predict the occurrence of a particular hazard, but it does "quantify" the risk of one hazard compared with another. By doing this analysis, planning can then be focused where the risk is the greatest.
- Relationship to Hazard Mitigation Planning: the EOP includes information that is relevant to the Marion County Hazards Mitigation Plan and vice versa. Hazard rankings from the EOP were included in the Hazards Mitigation Plan's Hazard Chapters. Ideally, the EOP and Hazards Mitigation Plan will eventually share, and benefit from one risk assessment. As such, information from the HMP may be integrated into the EOP.

#### Marion County Storm water Management Program for the Urbanized Area around Salem and Keizer

- Date of Last Revision: 2004
- Author/ Owner: Marion County

- Description: Outlines the different components of Marion County's Storm water Management Program: (1) Public Education; (2) Public Involvement; (3) Illicit Discharge/Pollution; (4) Construction Erosion Control; (5) Post-Construction Runoff Control; (6) Municipal Operations/Pollution Prevention. The program is intended to meet the requirements of the National Pollutant Discharge Elimination System (NPDES) Program as developed under the federal Clean Water Act.
- Relation to Hazard Mitigation Planning: Marion County's Stormwater Management Program develops and implements education and outreach strategies related to stormwater management. Existing connections with the public can be utilized to disseminate educational materials related to hazards mitigation. Additionally, mitigation actions that seek to reduce the hazards associated with urban flooding can be implemented through the county's Stormwater Management Program, or vice versa.

#### Marion County Rural Transportation System Plan (RTSP)

- Date of Last Revision: 2013
- Author/ Owner: Marion County
- Description: A Transportation System Plan (TSP) is required to provide a transportation system that accommodates the expected 20-year growth in population and employment resulting from implementation of the currently adopted Marion County comprehensive land use plan. In 2013, Marion County updated the Background, Goals, Facility Inventory, Traffic Projections, and Strategy sections.
- Relation to Hazard Mitigation Planning: Transportation systems are important in evacuating and responding to disasters. Mitigation actions that focus on strengthening the transportation system can be incorporated into the Transportation Systems Plan.

#### North Santiam Watershed Drought Contingency Plan (DCP)

- Date of Development: 2016 plan development in process
- Author/Owner: Santiam Water Control District
- The Santiam Water Control District (SWCD) has recently received funding through a Bureau of Reclamation WaterSMART grant to develop and implement a Drought Contingency Plan for the North Santiam Watershed (<http://www.usbr.gov/drought/>). The effort includes an overall assessment of drought risk, a process for ongoing monitoring of drought in the region, and a set of mitigation strategies and recommendations to ensure coordinated management of water resources. Identified vulnerabilities by sector or asset category include: agriculture, municipal water supplies (i.e. drinking water), energy, forestry, environmental (e.g. endangered species), recreation, and socio-economic (i.e. commercial, industrial and community uses).
- Relation to Hazard Mitigation Planning: Drought is a growing issue in Marion County. Water management trade-offs include drinking water, irrigation, recreation, habitat, flooding, wildfire, and water quality considerations. The Drought Contingency Plan will help the county prioritize and manage competing water related issue in the future.

## **APPENDIX D: LIFELINE SECTOR ASSESSMENT**

This section describes the findings from the 2016 Marion County Lifeline Sector Assessment. In 2015, a University of Oregon Community Planning Workshop student team conducted an assessment of lifeline sectors identified by Marion County – transportation, energy, communication, and water. The assessment focused on review of each sector’s adaptive capacity and vulnerabilities, as well as critical interdependencies. The team adapted OPDR’s Hazard and Climate Vulnerability Assessment Tool, which was created through public and private partnerships, to complete the assessment. The assessment consisted of the following general steps:

- Sector Assessment Part 1: The first step was to assess each sector’s adaptive capacity. The team conducted this assessment independent of any particular hazard scenario. To complete the task the team adapted and administered Part 1 of the Vulnerability Assessment Tool to representatives from each sector. The team conducted this phase as part of facilitated meetings with lifeline sector stakeholders, system managers and experts. The team then summarized the information received in the sector report.
- Sector Assessment Part 2: The second step was to assess each sector’s hazard sensitivity and potential impacts. The team utilized specific chronic and catastrophic hazard scenarios to inform and direct the discussion. The team worked with the local project lead to select one chronic hazard – flood, and one catastrophic hazard – Cascadia earthquake. To complete this task, the team adapted and administered Part 2 of the Vulnerability Assessment Tool to representatives from each sector. The team conducted this phase as part of facilitated meetings with lifeline sector stakeholders, system managers and experts. The team then summarized the information received in the sector report.
- Sector Assessment Part 3: The team compiled the results and information into a set of sector summaries.

The following subsections are organized as follows: Transportation, water, energy, and communications.



## LIFELINE SECTOR: TRANSPORTATION

Transportation is critical lifeline infrastructure. The transportation network facilitates the movement of people, goods, resources and commerce throughout Marion County and beyond. The transportation system consists of local, state, and federal road and highway networks; passenger and freight rail; passenger and freight air service; pipelines; transit; dedicated bicycle and pedestrian systems; and limited water-based modes. All lifeline sectors depend on the transportation system.

### Assessment Snapshot

#### Transportation Sector Summary

<p><b>Critical Interdependencies:</b> Systems of all types are dependent on other systems in order to function. In order to operate, the transportation sector is particularly <b>DEPENDENT ON:</b></p> <ul style="list-style-type: none"> <li>• Energy and Fuel</li> <li>• Communication</li> <li>• Business and Industry</li> <li>• Public Works</li> </ul> <p><b>Other critical lifeline sectors that <u>DEPEND ON</u> the transportation sector to operate include:</b></p> <ul style="list-style-type: none"> <li>• Water</li> <li>• Electricity</li> <li>• Liquid fuel</li> <li>• Public Safety and Emergency Management</li> <li>• Public Works</li> <li>• Economy</li> </ul>	<p><b>Crucial Vulnerabilities:</b> Each sector has a number of vulnerabilities. The transportation sector is particularly vulnerable to the following:</p> <ul style="list-style-type: none"> <li>• Federal, state and local bridge infrastructure is particularly vulnerable to earthquake (especially ODOT facilities over the Willamette).</li> <li>• System relies heavily on fossil fuels for construction, operation, and maintenance.</li> <li>• Hwy 22 is the primary east-west connection; there are few redundant east-west routes.</li> <li>• Significant backlog of deferred transportation maintenance projects.</li> </ul>
<p><b>Major Findings:</b></p> <ul style="list-style-type: none"> <li>• ODOT considers I-5 and Highway 22 to be critical routes. Other critical concerns include bridges, roads, communication, and energy including power and fuel.</li> <li>• Much of the existing transportation infrastructure, including those of major roadways such as I-5, Highway 22, and Mission Road, are not seismically retrofitted and will likely experience structural failures during a Cascadia event.</li> <li>• Following a Cascadia event, transportation will be limited for 6-12 months; aftershocks may extend that timeframe.</li> <li>• Transportation is interdependent with communication, water, and energy systems and</li> </ul>	

requires coordination and collaboration during the response and recovery process.

- Although winter storms continue to impact transportation systems, stakeholders respond to these events efficiently and continue to improve plans with every winter weather event. Downed trees, debris, and accumulated ice impact the response of this lifeline.
- Salem-Keizer Transit operates city and regional buses, dial-a-ride, CherryLift for people with disabilities, and coordinates non-emergent medical transportation services. They provide about 4-million rides a year and are currently working to improve individual employee preparedness as well as existing emergency plans.
- Salem-Keizer Public Schools transports an estimated 22,000 students a day including about 2,000 medically fragile students. The top priority for this organization is student safety.
- The electricity grid in Oregon is not particularly dependent on the transportation sector to operate. However, the power generation and distribution network does rely on the transportation network for construction as well as ongoing maintenance and repairs.
- Conversely, all of the liquid fuel in the state is transported by one of three primary transportation modes: truck, rail, and pipeline. Therefore, the distribution fuel in the state is completely dependent on the transportation sector.
- Like the electric grid, the communications sector is not particularly dependent on the transportation sector to operate. However, the power generation and distribution network does rely on the transportation network for construction as well as ongoing maintenance and repairs.
- Business and industry is very dependent on the transportation sector. From the movement of raw material, to getting employees to and from work, to getting finished products to market, virtually all business and industry activity in the region is facilitated by transportation.
- Public works is dependent on transportation in two primary ways. First, the transportation sector facilitates the movement of equipment, materials, and workers. Second, significant portions or components of public works' infrastructure are collocated within transportation rights of way.

## Introduction

Access to means of transportation is fundamental to human existence. Transportation infrastructure facilitates everything from a local trip to the park, drugstore or place of employment to international trade and commerce. Furthermore, the ability to move people, goods and services is vital before, during and after emergency events. It is no accident that FEMA's number one Emergency Support Function is transportation. ESF #1 covers the following:

- Aviation/airspace management and control
- Transportation safety
- Restoration/recovery of transportation infrastructure
- Movement restrictions
- Damage and impact assessment

The scope of ESF #1 includes supporting, “. . . prevention, preparedness, response, recovery and **mitigation** activities among transportation stakeholders . . . [emphasis added]” and coordinating, “the restoration of the transportation systems and infrastructure.”<sup>1</sup>

Transportation lifeline sector participants identified a number of interconnected resources and elements of their operations. These include included roads, bridges, buses, and physical buildings. While this assessment focusses on infrastructure, participants noted that transportation staff and professionals are a critical resource as well.

## Primary Agencies and Organizations

The following organizations and agencies participated in this assessment:

- City of Salem
- City of Woodburn
- Marion County Public Works
- Marion County Sherriff's Office
- ODOT
- Salem Public Works
- Salem-Keizer School District
- Salem-Keizer Transit
- Woodburn Transit Service

## Sector Description

The transportation sector consists of a vast, multimodal network of fixed and mobile public and private assets. This diversity is part of what makes the transportation sector so vital to so many users. However, it is also what makes assessment of the sector challenging.

The primary transportation infrastructure components in Marion County are summarized below followed by more detailed descriptions as provided by the sector participants:

- State and interstate highways: I-5, Hwy 22, Hwy 99, Hwy 214
- County and city road collection and distribution networks. Participants identified eight roads as making up the county's primary collector network: Cordon Road in Salem,

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<sup>1</sup> FEMA, Emergency Support Function #1 – Transportation Annex. 2008.  
<https://www.fema.gov/pdf/emergency/nrf/nrf-esf-01.pdf>

- Cascade Highway (213), Hillsboro-Silverton Highway (214), Lancaster Drive, Butteville Road, Jefferson/Marion Road, River Road, Aumsville Highway (connects to prison).
- Bridges, as a critical subset of the city, county, state and interstate road network.
- Public and semi-public transit providers (e.g. Salem Keizer Schools has over 250 school busses, a yard and 56 school drop sites with transit responsibility for roughly 22,000 schoolchildren daily; Salem transit district maintains 56 full size busses and multiple regional busses).
- Passenger and freight rail system: Amtrak operates on the UP line and offers daily passenger rail service through Marion County; Union Pacific, which runs roughly 24 freight trains a day on its line, including hazardous materials; and Portland and Western.
- Fuel and natural gas pipelines
- Two regional airports: Salem municipal airport (includes Oregon Army National Guard – Army Aviation Support Facility) and Albany Municipal Airport and numerous local airports and heliports.
- Two limited capacity ferries: Buena Vista Ferry and Wheatland Ferry

## Marion County Public Works

Marion County Public Works identified critical roads for their operation including:

- Cordon Road
- Cascade Highway
- Silverton Road
- Hail Prairie
- Butteville Road
- Jefferson Marion Road
- River Road N/S
- Aumsville Highway
- Highway 22
- Highway 99E
- Interstate 5

The City of Salem is the seat of Marion County. Accordingly, it is the main base of operations for Marion County Public Works and has access to backup power. There are three other district buildings, as well as underground fuel storage tanks. The only site that has its own generation capacity to pump fuel is at the North Marion location.

## Marion County Sherriff's Office

The Marion County Jail is located on Aumsville Highway. It has backup generation for 36-hours. The Sherriff's Office is also responsible for the continued operation of the Marion County Courthouse. The jail is only served by Aumsville Highway without any redundancy in access.

## City of Salem

Arterial streets and bridges are the most critical infrastructure in the City of Salem. The City has jurisdiction over several bridges and there are ODOT bridges that cross the Willamette River. The City identified these bridges as important to accessing West Salem. In the case of an emergency or natural hazard event, the Salem Public Works operations facility has heavy equipment that includes snowplows and dump trucks.

## City of Woodburn

Woodburn identified the major roadways Oregon Routes 213, 214, 99E, and U.S. Interstate 5 as key transportation infrastructure. During a hazard event, the City's priority is keeping critical arterials roads open, as well as service collectors to help mitigate traffic flow.

## Keizer School District

Keizer School District has a fleet of buses that transports over 20,000 students every day, of which 10 percent have special needs. The school district has 66 traditional school sites and 15 nontraditional school sites and their vulnerable populations are concentrated at their preschool, teen parent site, and alternative school site.

There are 12 support sites and school buses are stored at three facilities located on River Road, Gaffin Road, and Hawthorne Avenue respectively. Each facility has over 200 buses and 10,000 gallons of diesel fuel storage. But, their Hawthorne facility is constructed of poor quality concrete and is not ready for an earthquake. The facilities building have trucks and vans, in addition to refrigerator trucks located at the food service site. Keizer School District relies on a radio dispatch network to communicate with buses out on their routes. It is supported by repeaters and has backup generation capacity, with the intent to switch to a digital cable system.

Lastly, Risk Management staff is continuing to plan for scenarios with the Sheriff's Office and Salem by developing responses for man-made and natural hazard events.

## Salem-Keizer Transit

Salem-Keizer Transit has 64 large buses and also operates regional and paratransit buses. The agency is taking steps to have employees prepare at home so that employees can get to work.

The buses run on either diesel or compressed natural gas (CNG). There is a direct connection to the natural gas line, but there is not backup power for pumping natural gas.

## ODOT

ODOT considers all state and federal highways as priority roads and in Marion County. However, Highway 22 was identified as being particularly critical as it is the primary east-west connection through the county. ODOT also manages a railroad overpass that has been converted to a non-motorized alternative modes bridge. The bridge is open to runners, cyclists, and pedestrians. Notably, the project provides a critical half-mile link in the bicycle and pedestrian circulation systems for the community, the region, and the state. Moreover, ODOT also maintains a motor pool in Salem and operates its own inter-city transit services and vanpools. It also works with rail, airports, and public transit providers, including Amtrak, which maintains a hub in Salem. Amtrak shares rail lines with freight and while ODOT does not own any stations or lines, it is an important partner in operation for both services.

Highway 22 and Mission Road have structures that are not seismically retrofitted. However, the walking bridge would likely remain a viable alternative for pedestrian and bicycle access across the river after an earthquake. Some ODOT facilities are seismically retrofitted, including ODOT headquarters. ODOT is currently considering an option for a ferry to cross the Willamette River.

ODOT relies heavily on the communications sector and would have difficulty functioning without communications. They do have radio backup capabilities. ODOT identified rerouting must consider overpass availability and has established rerouting of traffic around Interstate 5 using side and city roads. Some facilities, like the Salem Operation Center, may not withstand a Cascadia event. ODOT identified Highway 22 as a critical road as it may be one of the only east-west connections through the cascades.

# Adaptive Capacity

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Adaptive Capacity refers to a system's ability to accommodate a new or changing environment, exploit beneficial opportunities, or moderate negative effects.

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In general terms, the transportation sector has a low level of adaptive capacity. This is primarily due to the large scale and fixed nature of the infrastructure itself. Highways, roads, bridges, airports, and railroads are expensive to construct and not easy to relocate. The political, financial and policy issues related to transportation work as further limits to adaptation. Furthermore, when transportation infrastructure is damaged or otherwise impacted, it takes significant time and investment to fix. Similarly, a huge portion of the sector is completely reliant on fossil fuels to operate. In a state with significant fuel vulnerability, fuel availability becomes a single point of failure for much of the sector even if the physical infrastructure is not impacted. Finally, the entrenched set of sub-sector or mode-specific subsidies, incentives or disincentives pose significant challenges to sector diversification, particularly at the local level.

## Interdependencies

Systems of all types are dependent on other systems in order to function. In order to operate, the transportation sector is particularly *dependent on*:

### Energy: Electricity and Fuel

The transportation sector is not particularly dependent on electricity. Electricity is needed for traffic signaling and network lighting needs. Further, a small but growing portion of passenger vehicles and some transit modes use electricity. However, these represent a very small percentage of the entire transportation fleet across all modes. The sector is, however, critically dependent on liquid fuel. The vast majority of passenger and freight vehicles, emergency vehicles, aircraft, equipment, and rail all run on fossil fuel. In addition, significant portions of the infrastructure itself consist of fossil fuel derivatives, asphalt being the most notable.

### Communication

Transportation is dependent on communication in some modes more than others. Air traffic control, for example, depends on multiple modes of communication to ensure safe air travel. Similarly, passenger and freight rail rely on communications for switching and scheduling. Increasingly, communication systems are used for real-time transportation demand management, traffic control, emergency routing information and trip planning purposes. Finally, communication systems are used to dispatch maintenance crews and to communicate with transportation-related public-safety and law enforcement units.

### Business and Industry

The transportation system is heavily reliant on private engineering, design, construction, manufacturing and raw material businesses and industry. Further, most of the vehicles used in transportation are manufactured by private business and industry. Freight rail, commercial air, and pipeline infrastructure is largely owned and operated by private businesses. In short, the transportation sector is critically dependent on private business and industry to operate.

## Public Works

Similarly, significant portions of the physical transportation infrastructure are financed, constructed and maintained by the public sector. State and local public works departments are responsible for much of the surface transportation infrastructure in Marion County.

## Vulnerabilities

The assessment team evaluated the transportation sector's vulnerability using a scenario planning approach which included one chronic event (winter/ice storm) and a catastrophic event (9.0 Earthquake).

### Chronic Hazard: Winter/Ice Storm

Participants indicated that a winter storm could lead to flooding, further compounding damage and harm. ODOT identified that winter storms have significant impacts on their operations as it interrupts emergency, commercial, and personal vehicle capability. In 2014, the mid-Willamette Valley experienced a significant winter storm. ODOT has identified gaps in their response and has planned for future events accordingly. All five ODOT regions have a winter storm plan. There are now also electronic copies, in addition to paper copies.

Keizer School District is also highly sensitive to a winter storm. Decisions around how and when to shelter students or cancel school follow a very specific plan. An area of concern is in regard to bus drivers' hesitance to drive in snow and ice and whether there will be enough drivers and keeping students safe on buses if they are stuck on roads in severe winter conditions. Diesel gelling in extremely cold weather is also a concern for bus operation.

Salem Public Works reported low sensitivity to a winter storm and that their staff and equipment are prepared for this type of event. Their County counterpart, Marion County Public Works, has a yearly test of equipment and staff assignments. Salem-Keizer Transit has a snow plan that facilitates their determination of service capability during a winter storm event.

### Catastrophic Hazard: Cascadia Earthquake Event

All participants report extremely high sensitivity to a Cascadia Earthquake with widespread impacts. ODOT in particular reported extreme sensitivity to a Cascadia earthquake event. Much of interstate highway system is not seismically retrofitted and it is likely that Interstate-5 would fail. ODOT has plans to mitigate seismic impacts, but lacks funding to execute.

The Sheriff's Office identified a need to maintain the Courthouse operations and balance law enforcement duties. Of particular concern is moving a population of 3,700 incarcerated individuals if the jail structure is damaged.

Several participants have already begun hazard mitigation and have regular planning meetings. While Salem-Keizer Transit does not have a formal plan, but has begun assessing capabilities and limitations.

## Mitigation Opportunities

The transportation sector representatives identified a number of potential mitigation opportunities.

### Add Lifeline Corridors to Transportation System Plan

The Marion County Transportation System Plan is “a planning tool that is used to identify transportation projects throughout rural Marion County – this includes roads, transit, bicycles, pedestrians, rails, ferries, freight, and air.” In short, it outlines medium- and long-term investments in transportation infrastructure. Although it was recently updated in 2013, the TSP does not specifically identify lifeline corridors or utilize lifeline corridors as a factor in determining TSP project priority. Aligning critical infrastructure mitigation with standard planning activities is one way to better ensure implementation and increase resilience.

### Designate Critical Facilities and Employers in City and County TSP

Similar to lifeline corridors, city and county TSPs do not currently include comprehensive assessments of critical facilities and employers. Therefore, transportation investments are not necessarily being targeted to ensuring critical facility and employer transportation access before, during and after disaster events. Integrating hazard mitigation considerations related to critical facilities and employers with standard transportation planning activities is one way to ensure implementation and increase resilience.

### Designate Priority Transportation Routes in Marion County

Sector participants highlighted the need to prioritize transportation planning routes in Marion County. The group discussed a “hub and spoke” approach to ensure that resources can be distributed throughout the county from known centralized assembly points (e.g. the Oregon Army National Guard – Army Aviation Support Facility at the Salem Airport). Once routes are prioritized, the county can use that framework to focus transportation related vulnerability assessments (e.g. bridge structural assessments for seismic) and capital improvement plan investments.

### Identify Local Funding Sources

While some additional prioritization and integration is warranted, as outlined above, participants also acknowledged that many plans already ID transportation related mitigation projects. These are evident across multiple departments and agencies. Participants identified funding, primarily local sources, as a key barrier to implementation. Participants encouraged efforts to identify local sources of funding to support transportation related mitigation projects.

### 24-Month Preparation and Outreach Campaign

Participants acknowledged that without increased awareness and preparation, no amount of planning will be enough. The group proposed a targeted and focused 24-month Preparation and Outreach Campaign. The goal of the campaign could be to increase awareness about the vulnerability of the transportation sector in Marion County. Key outcomes could be to increase the level of preparation on the part of citizens, businesses and agencies related to transportation.

### Partner with the Marion County Farm Bureau

Participants briefly discussed opportunities to coordinate with the Marion County Farm Bureau on transportation related mitigation projects. The Farm Bureau has not traditionally been a partner in the county’s mitigation efforts. However, the Farm Bureau represents a constituency that is highly dependent on access to multiple transportation modes. Collaboration with the Farm Bureau on issues of mutual benefit could be a way to increase awareness and political buy-in.



## LIFELINE SECTOR: WATER

Water is critical to life. After three days without water, a person will experience severe dehydration, which may lead to death if not reversed. Alone, the intrinsic need for water qualifies the water sector as a lifeline. Water is something our family, friends, emergency personnel, healthcare professionals, and whole community is dependent upon.

### Assessment Snapshot

#### Water Sector Summary

<p><b>Critical Interdependencies:</b> Systems of all types are dependent on other systems in order to function. In order to operate, the water sector is particularly <b>DEPENDENT ON:</b></p> <ul style="list-style-type: none"> <li>• Electricity</li> <li>• Communication</li> <li>• Transportation</li> <li>• Liquid Fuel</li> </ul> <p><b>Other critical lifeline sectors that <u>DEPEND ON</u> the water sector to operate include:</b></p> <ul style="list-style-type: none"> <li>• Fire and EMS</li> <li>• Business and industry</li> <li>• Electricity</li> </ul>	<p><b>Crucial Vulnerabilities:</b> Each sector has a number of vulnerabilities. The transportation sector is particularly vulnerable to the following:</p> <ul style="list-style-type: none"> <li>• The water sector in Marion County consists of numerous local and regional systems.</li> <li>• Several reservoirs, transmission lines and the Salem Treatment Facility are vulnerable to multiple hazards.</li> <li>• Aquifer storage capacity not sufficient to meet need as a backup source.</li> </ul>
<p><b>Major Findings:</b></p> <ul style="list-style-type: none"> <li>• People living in unincorporated areas of Marion County rely on wells and septic tanks.</li> <li>• Low water reserves and low river flow pose a serious threat to the water supply.</li> <li>• Some infrastructure pertaining to water systems are old which increases the risk vulnerability to withstand a Cascadia event. Impacted infrastructure located near rivers could cause service disruptions and flooding during an event or incident. Power is vital to the water facilities.</li> <li>• Generators are co-located at critical facilities and need to be maintained requiring various fuel types in order to support redundancy.</li> <li>• Road access is vital to conduct damage assessments and or repair impacted facilities.</li> </ul>	

## Introduction

For the purposes of this assessment, the water sector includes information pertaining to drinking water, storm water, and wastewater. Stakeholder participants included a range of local and regional infrastructure and service providers. The information provided in this summary is based on research of the county's water resources and infrastructure.

Ready access to virtually unlimited amounts of clean drinking water is often taken for granted, particularly here in the Pacific Northwest. Water is vital for basic daily living, for business and industry especially including agriculture, for fire protection and medical service provision, and for wastewater management. In addition, storm water facilities provide critical protection from a variety of localized flood risks. FEMA Emergency Support Function #3 covers public works, including water, wastewater and storm water services. Ensuring that all water related public works infrastructure is operational is critical to the function of any community.

## Primary Agencies and Organizations

The following organizations and agencies participated in this assessment:

- Public Works
- City of Stayton
- City of Turner
- City of Salem
- Marion County
- City of Keizer
- North Santiam Watershed Council

The North Santiam Water Council (NSWC) provides resources and knowledge to Marion County. The NSWC is currently working on a Drought Contingency Plan. This will allow the NSWC to better understand the availability and general magnitude of available water resources.

## Sector Description

The water sector consists of three primary sub-sectors: drinking water, wastewater and storm water. Common elements of the drinking water system include source water, intakes, treatment, reservoir storage, transmission, and distribution. Common elements of the wastewater system include collection and treatment. Storm water systems are primarily collection systems.

Because each jurisdiction has their own infrastructure with similar components additional information specific to each of the participating jurisdictions is included below.

### City of Salem

People living in unincorporated areas of Marion County mainly rely on wells and septic tanks.

Marion County Storm and Surface water drainage system includes urbanized East Salem Service District infrastructure, as well as rural roadside drainage ditches. The Service District was established for sewer and lighting, and is now also serving as a storm water service area. There is a wastewater treatment plant near Keizer. The County Board of Commissioners also serves as the District Board.

## City of Aurora

The City of Aurora relies on a groundwater system and the Pudding River to provide access to water. It is located at the end of the Troutdale watershed.

## Stayton

Stayton's sanitary sewer, storm water and water systems are bound within the City limits of Stayton. The City buys water from the Santiam Water Control District and draws water off of a Santiam ditch intake. The City of Stayton also has two wells, which each store enough water for one day. Both of Stayton's drinking water facility and wastewater facility are located near the Santiam River. The drinking water facility used a slow sand filtration system and is currently working on looping the system.

## Turner

The City of Turner buys water from the City of Salem. Its water system is capable of serving its 2000 residents and is comprised of two water tanks, two pump stations, 15 miles of pipes, and 200 hydrants. Turner's two water tanks gravity feed the city and is located on a "cliff." Turner also hosts one of Salem's reservoirs.

## Salem

As the County seat and capitol of the State of Oregon, Salem plays a significant role in the water sector. The City owns water rights in the North Santiam Watershed and its treatment facility is located on Geren Island, just east of Stayton. Water is conveyed through two large transmission mains to reservoirs, pump stations, and customer taps. There are 17 miles of transmission mains that separate Geren Island from the City of Salem. There are 18 finished water reservoirs. Salem utilizes SCATA, which detects problems in the distribution system. The City of Salem is 70 percent gravity fed and uses a slow sand filtration system to purify its water. The water is also tested upstream. The system is also protected by two valves that are able to isolation sections of the system.

Salem also provides water to three wholesale customers: City of Turner, Suburban East Salem Water District, and Orchard Heights Water Association. The City also operates an Aquifer Storage and Recovery (ASR) system in south Salem. The ASR is replenished in winter rains and stored for the dry days of summer.

## Adaptive Capacity

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Adaptive Capacity refers to a system's ability to accommodate a new or changing environment, exploit beneficial opportunities, or moderate negative effects.

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In general terms, the transportation sector has a low level of adaptive capacity. This is primarily due to the large scale and fixed nature of the infrastructure itself. Highways, roads, bridges, airports, and railroads are expensive to construct and not easy to relocate. The political, financial and policy issues related to transportation work as further limits to adaptation. Furthermore, when transportation infrastructure is damaged or otherwise impacted, it takes significant time and investment to fix. Similarly, a huge portion of the sector is completely reliant on fossil fuels to operate. In a state with significant fuel vulnerability, fuel availability becomes a single point of failure for much of the sector even if the physical infrastructure is not

impacted. Finally, the entrenched set of sub-sector or mode-specific subsidies, incentives or disincentives pose significant challenges to sector diversification, particularly at the local level.

## Interdependencies

Systems of all types are dependent on other systems in order to function. In order to operate, the transportation sector is particularly *dependent on*:

## Vulnerabilities

The assessment team evaluated the water sector's vulnerability using a scenario planning approach which included one chronic event (winter/ice storm) and a catastrophic event (9.0 Earthquake).

### Chronic Hazard: Winter Storm

The drought conditions of 2015 caused great concern and pointedly raised awareness of the water's vulnerability to drought. Low water reserves and low river flow pose a serious threat to the ability to supply water. In addition, with low water levels water quality is of concern. Even with a normal pollutant load, the pollutant concentration will be higher than normal due to the lack of water to dilute.

Winter storms did not pose a high threat to the water sector, but the potential flooding to follow was a major vulnerability. Many of the Cities' infrastructure is located near a river. Flooding could shut down operations creating supply issues. A flood may also wash pollutants into the water sources. However, the predictability of a flood allows for the sector to mitigate and prepare for the hazard event. Lastly, flooded roads and bridges could create an access issue in trying to reach facilities.

### Catastrophic Hazard: Cascadia Earthquake Event

Much of the water sector's necessary infrastructure and facilities are old and it is unknown how they will fare in an earthquake event. Some underground transmission lines are over 80 years old and none of the treatment facilities were known to be seismically retrofitted. The location of drinking water treatment facilities and wastewater facilities along riverbanks poses a threat as the soil underneath is subject to liquefaction. If any water supply is available, it will only be used for priority usage including drinking water and water for fighting fires.

The water sector's large uncertainty of how the earthquake will impact their operations parallels their uncertainty of how they will respond and recover. The staff's first reaction will be to secure their own families and then try to find a way to communicate with their colleagues. However, regular communication pathways might be shut down and other options are instead being considered, such as satellite and HAM radio.

Secondly, communities will need to identify points in the system that have been broken, which relies on their ability to access roads and bridges. Currently, supplies, tools, and machinery are not equally distributed throughout the County, which could lead to difficulty in staff accessing and repairing isolated facilities if roads, communications, or energy is inaccessible. Overall, the response and recovery of the water sector will hinge on the ability of staff to access the section of the system needing fixed and having the right resources to fix it.

Wastewater treatment plants pose a health risk. A prime example is the Marion County wastewater treatment plant, just outside of the Keizer city limits. If the Marion County

wastewater treatment plant shuts down, the sewage will become backlogged and spill out into the streets of Keizer. This may pose a health and safety hazard, while also potentially contaminating freshwater supplies.

In addition, earthquakes may cause landslides into rivers, causing high turbidity and a potential of high pollutant loads. There are also a number of railroad lines located along river ways, and a hazardous spill that contaminates a relied upon watercourse could result in serious consequences.

## **Mitigation Opportunities**

The water sector representatives identified a number of potential mitigation opportunities. Notably, the need to increase diversity and redundancy were key themes throughout the water sector conversations.

### Complete and Implement Drought Contingency Plan

Participants indicated that water quantity will continue to grow as a key issue. Participants acknowledged the work being done to develop a drought contingency plan for the county and applauded the collaborative, multi-agency effort currently underway. The group indicated that completing and moving quickly to implementing the Drought Contingency Plan should be the highest priority for the water sector in Marion County.

### Add risk assessment and hazard mitigation information to water master plans

Participants noted that most water master plans do not integrate risk assessment and hazard mitigation strategies. Generally speaking, water master plans outline a program to ensure customers have access to quality drinking water. These include medium- and long-term investments in water infrastructure. Aligning critical infrastructure mitigation with standard planning activities is one way to better ensure implementation and increase resilience.

### Increase diversity and redundancy of equipment

Sector stakeholders noted throughout the discussion, that increasing the diversity and redundancy of equipment is critical to the provision of water. Single points of failure, whether at an intake, pump station, or transmission line can take the entire system off-line. Therefore, the group emphasized the need to ensure critical components of the system are backed up.

### Increase diversity and redundancy of information

Participants noted that much of the detailed information about water systems is now held in digital or on-line files. Should the electronic system be down or access to electronic files is limited, water system managers would not have access to even basic information about the processing, transmission and distribution systems. Participants indicated that maintaining paper copies of key information and maps should be common practice.

### Develop a pre-determined “shut down” process, procedure and prioritization

If multiple systems need to be shut down, the county does not currently have a good understanding of the order and priority. The group discussed the need to predetermine a process, procedure and prioritization scheme. As part of this effort, determining points of contact and communication protocols is important.

### Continue to evaluate infrastructure mitigation opportunities

Participants outlined several examples of water infrastructure that is old, out of date. In other cases, participants cited partial progress on resilience where additional investments are still needed.

## LIFELINE SECTOR: ENERGY

The energy sector is critical to modern life. Electricity is vital for virtually all household, business and emergency operations; liquid fuel is used for transportation, facility construction and repair, and backup power; natural gas is used for electricity generation, heating, cooking, powering vehicles, and other uses. The resilience, redundancy, and interdependencies of the energy sector will largely determine the timeline for emergency response and long-term community recovery. Diverse and redundant energy supply and distribution can significantly increase regional resilience.

### Assessment Snapshot

#### Energy Sector Summary

<p><b>Critical Interdependencies:</b> Systems of all types are dependent on other systems in order to function. In order to operate, the communication sector is particularly <b>DEPENDENT ON</b>:</p> <ul style="list-style-type: none"> <li>• Transportation</li> <li>• Communication</li> </ul> <p><b>Other critical lifeline sectors that <u>DEPEND ON</u> the communication sector to operate include:</b></p> <ul style="list-style-type: none"> <li>• Public Safety and Emergency Management</li> <li>• Transportation</li> <li>• Water</li> <li>• Communication</li> <li>• Economy</li> </ul>	<p><b>Critical Vulnerabilities:</b> Each sector is vulnerable to a variety of impacts. The energy sector is particularly vulnerable to the following:</p> <ul style="list-style-type: none"> <li>• Consumption consists almost entirely of one of three forms: electricity, liquid fuels, natural gas.</li> <li>• Dependence on BPA for electric power; Marion County produces very little power locally.</li> <li>• Lead time for ordering critical system components (e.g. transformers)</li> <li>• Concentration of liquid fuel storage facilities in Portland; limited local fuel storage and supply.</li> <li>• Lack of capability to pump fuel locally without power.</li> <li>• Reliance on supply and distribution facilities located outside Marion County.</li> </ul>
<p><b>Major Findings:</b></p> <ul style="list-style-type: none"> <li>• Generators are co-located by equipment and are used at critical infrastructure throughout the county; however, require various fuel types depending on the unit.</li> <li>• Oregon’s fuel storage facilities are located in Portland and are susceptible to failure due to soil liquefaction. The storage capacity on a normal day is six days; therefore, it is anticipated that fuel will be an undersupplied commodity during a Cascadia event. It will take 3-6 weeks to reacquire fuel.</li> <li>• Energy is critically interdependent with the transportation, communication, and water sectors. For example, not having access to roads nor having the ability to communicate with responder’s leaves the energy sector extremely vulnerable. In addition, there is a need for energy in powering water treatment plants. These</li> </ul>	

vulnerabilities are particularly heightened in areas where accesses via bridges or singular roads are susceptible to failure.

- The EPA regulates energy in terms of emissions limiting the capacity to produce additional energy resources.
- Damage assessments will be critical to capture the impacts to this lifeline. Downed trees, accumulating ice, and high winds can impact the resiliency of energy as a lifeline.
- The energy sector also prepares and mitigates against human-made disasters, such as cyberattacks.
- The energy sector grants people with uninterrupted services due to medical status during non-catastrophic events.
- An estimated 1-3 months of electrical service interruption during a Cascadia event.

## Who participated?

The following organizations and agencies participated in this assessment:

- Pacific Gas and Electric (PGE)

## Sector Description<sup>2</sup>

The energy sector is one of the most crucial lifelines in Marion County, providing electricity, liquid fuel and natural gas to residents and businesses from Aurora to Stayton and Salem to Idanha. Energy supports a wide array of community needs from charging cellphones to powering lifesaving medical equipment. Furthermore, other lifeline sectors rely on energy to provide many basic services. The resilience of this sector in a natural hazard event will greatly influence response capabilities. Furthermore, post-event recovery operations and success will depend in large part on the length of time it takes the energy sector to come back on line.

### Electricity

The electric sector in Marion County is comprised of two local providers (Salem Electric and Pacific Power), and a federal power agency (Portland General Electric (PGE)). These three companies provide electricity to over 300,000 people in Marion County. Electric facility construction and maintenance is a key component of this sector's responsibility. The local agencies are primarily responsible for the distribution of electricity to residential, commercial, industrial and institutional customers. The vast majority of electricity generation is provided by the Bonneville Power Administration (BPA). Their resiliency and ability to respond in a hazard event is vital to reestablishing other important lifelines and facilities. For the purpose of this analysis, the information included primarily pertains to PGE, which is the largest distributor of electricity in Marion County.

PGE's critical infrastructure is located throughout Marion County and the larger Willamette Valley region. Currently, all of PGE's major hydroelectricity facilities are located outside of Marion County, in Timothy Lake, Clackamas River, and Estacada. Most of Oregon's liquid fuel is stored in reserves along the bank of the Willamette in the Portland Metro area. Notably, PGE

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<sup>2</sup> Due to limited stakeholder involvement, portions of this section are informed by the City of Salem Local Energy Assurance Plan and the Marion County Commodity Flow Study.

maintains a local critical facilities list that consists of key emergency response, industry and public agency partners.

Participants emphasized that the sector is actively working to increase the diversity and redundancy of local electricity supply and distribution through a number of innovative projects. The Salem Smart Power Center, hosted by PGE, is intended to be the hub of “one of the most advanced electrical systems in the country.”<sup>3</sup> Consisting of a 5-megawatt lithium-ion battery and inverter system, the Smart Power Center is intended to provide backup power to the regional grid. In conjunction with this project, the sector is working on a number of additional “micro-grid” projects. To date, the sector has identified seven potential sites micro-grid throughout the county. One of those sites, located at the Oregon Department of Public Safety Standards and Training facility in Salem, is currently being explored as a pilot project. Additionally, the sector is evaluating distributed satellite generation (DSG) siting opportunities throughout the region. Collectively, the vision for these electric supply and distribution projects is to create a “triangle of control” that significantly increases local electricity resilience.

## Liquid Fuel

The petroleum supply chain consists of extracting crude oil, transporting it to refineries, processing it into petroleum products, and finally transporting it to consumers, often via intermediate suppliers. After being extracted, crude oil is refined into a number of petroleum products, including:

- Motor fuel, primarily gasoline;
- Distillate fuel, including diesel fuels, industrial fuels, and heating fuels;
- Liquefiable Petroleum Gas, including ethane, propane, butane, and others;
- Jet fuel, used in aircraft engines;
- Residual fuel oil, a by-product of the refinement process often used to produce heat or electricity; and
- Other products such as asphalt, kerosene, and lubricants.

According to the Oregon Resilience Plan, over 90% of Oregon’s liquid fuel supply originates in the Puget Sound area in Washington. All of that fuel passes through the Critical Energy Infrastructure Hub north of Portland before it is distributed throughout the state. Marion County has limited liquid fuel supply reserves. According to the Salem Energy Assurance Plan, the Salem area has roughly 2.5-3.7 million gallons of fuel storage capacity. Assuming an average fuel storage volume, this equates to between three- and five-days of fuel availability.

## Natural Gas

The primary natural gas supply chain consists of the extraction and processing of natural gas; the transportation of that gas via pipeline; and the underground storage or direct use of the gas for heating, fuel, electricity generation, or other uses. Approximately one in three Oregonians rely on natural gas as the primary source for heating their homes.<sup>4</sup> Oregon produces no natural gas of its own and must import its entire supply from out-of-state. Oregon’s natural gas is produced in British Columbia, Alberta, Wyoming, Colorado, and New Mexico, and is transmitted to Oregon via an interstate pipeline system.

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<sup>3</sup> <https://www.portlandgeneral.com/our-company/energy-strategy/smart-grid/salem-smart-power-center>

<sup>4</sup> U.S. Energy Information Administration, *State Energy Data System* (Washington, DC: U.S. Energy Information Administration, 2011).



Marion County has two major gas transmission pipelines. Distribution lines are located throughout the county.

### **Summary Considerations:**

- Oregon imports 100 percent of its petroleum and natural gas, but generates most of its own electricity.
- Salem generates almost no electricity, and over half of its electricity supply is dependent on fossil fuels.
- Local generation and storage of electricity through on-site generators, solar panels, fuel cells, battery arrays, and other technologies can provide a way for individual facilities to diminish their vulnerability to electrical supply disruptions. Adoption of these technologies is far from universal; a widespread or long-term electrical outage would likely have severe consequences.
- The Puget Sound refineries provide more than 90 percent of Oregon’s refined petroleum products, and it operates at about 95 percent capacity.
- About one-third of Oregonians residents use natural gas for heating, and Salem’s natural gas supply is dependent a on a single pipeline.
- Salem depends on the road network for deliveries of petroleum products, and for deliveries of liquefied natural gas (LNG) if the natural gas network is disrupted. A petroleum pipeline travels through Salem but has no outlet there.

## **Vulnerabilities and Risk Assessment**

The energy sector’s vulnerability was assessed through scenario planning, which included a chronic event and a catastrophic event.

### **Chronic Hazard: Winter/Ice Storm**

The energy sector has fared well in recent winter storm events. On its own, a winter storm poses risk, but the negative impacts are often geographically isolated, limited to the electricity, and easily recovered from. For example, a winter storm might bring freezing rain, sleet, and ice which accumulate on tree branches, causing them to break and possibly damage power lines. Flooding as a result of snow melt poses a potential risk primarily due to impacts on the transportation system.

Damaged transportation infrastructure or the potential for limited road access in the event of a winter storm is the energy sector’s primary vulnerability. Transportation access is particularly a concern in rural areas that are accessible via bridges or singular roads. Energy providers must coordinate with transportation departments and public works crews to ensure roadways are passable prior to responding to damage or power outages.

Overall, energy sector recovery occurs relatively quickly during winter storm events as there are established protocols, trained personnel and equipment needed to respond and adapt to the event.

### **Catastrophic Hazard: Cascadia Earthquake Event**

Currently, the energy sector is extremely sensitive to a Cascadia subduction zone event or other large local earthquake. Energy infrastructure and facilities are highly sensitive to violent shaking and liquefaction. Notably, significant portions of Marion County are susceptible to liquefaction

during a large magnitude earthquake. An event of this size is expected to have significant impacts to all energy transmission, distribution, and storage facilities. The unpredictability of the Cascadia event stems from the inability to properly estimate individual facility impacts. As a result, the energy sector must work towards establishing hazard mitigation, infrastructure resilience, and coordinated response efforts that anchor their ability to provide service. The following vulnerabilities demonstrate points of weakness and opportunities for mitigation within the energy sector.

First, damaged transportation infrastructure or the potential for limited road access in the event of a Cascadia earthquake leaves the energy sector extremely vulnerable. This is particularly a concern in rural areas that are accessible via bridges or singular roads. Some of these roads and bridges are not seismically sound, or are located in areas that would be difficult to get supplies and repair vehicles and personnel to.

Marion County lacks energy independence; it is reliant on hydroelectric power, liquid fuel, and natural gas inventories that are supplied from outside of the County. Generators can be used in an emergency event. However, these depend on fuel to run. As a result of Oregon's current practices for storing fuel, a large earthquake event will lead to drastically lessened access to fuel. It is highly likely the fuel supply will be significantly limited and prioritized for emergency response and recovery following an event.

## Mitigation Opportunities

The energy sector assessment identified several potential mitigation opportunities.

### Compare, crosswalk and maintain critical facilities lists

BPA, Marion County and other state and local partners maintain lists of critical facilities. Some agencies prioritize those critical facilities for emergency response and recovery resources, including electricity and other energy sources. Participants expressed a desire to compare and coordinate those critical facilities lists to ensure consistency.

### Develop and maintain a "no-disconnect" list

At present, electric and natural gas utilities disconnect service after periods of non-payment. Vulnerable populations, particularly those that require electricity for medical equipment, can be placed a significant risk if service is disconnected. Developing a strategy to ensure that critically vulnerable populations are not disconnected from electrical service, even if they are unable to pay for service, is needed.

### All-hazard risk assessment for critical energy infrastructure

Stakeholders indicated that additional risk assessment information is needed across a range of hazards and infrastructure sectors. Specifically, there is a desire for a "bulk upload spreadsheet" where assessment information can input.

### Source additional funding for tree trimming projects

Participants acknowledged that additional funding is needed for hazard-tree trimming projects. Because power outages disproportionately impact vulnerable populations, these funds should be prioritized for improving electrical system resilience for vulnerable populations.

### Innovation project: Utilize used batteries tied to solar generation for backup power

Sector participants discussed how innovation could be used to increase local or micro-energy resilience. One participant observed that forklift, golf-cart and other batteries are often replaced prior to the end of their useful life. Batteries of this size are capable of storing significantly more

power than smaller car batteries. This project would assess the feasibility of utilizing used industrial batteries for backup power.

# LIFELINE SECTOR: COMMUNICATION

The communication sector facilitates the rapid exchange of information across a broad range of systems and technologies. These include: broadcast television and radio, telephone, cellular phone, cable, internet, two-way radio, and Ham (or amateur) radio.

## Assessment Snapshot

### Communication Sector Summary

<p><b>Critical Interdependencies:</b> Systems of all types are dependent on other systems in order to function. In order to operate, the communication sector is particularly <b>DEPENDENT ON</b>:</p> <ul style="list-style-type: none"><li>• Electricity</li><li>• Energy (fuel)</li><li>• Transportation</li></ul> <p><b>Other critical lifeline sectors that <u>DEPEND ON</u> the communication sector to operate include:</b></p> <ul style="list-style-type: none"><li>• Water (SCADA)</li><li>• Electricity</li><li>• Public Safety and Emergency Management</li><li>• Transportation</li><li>• Economy</li></ul>	<p><b>Critical Vulnerabilities:</b> Each sector is vulnerable to a variety of impacts. The communications sector is particularly vulnerable to the following:</p> <ul style="list-style-type: none"><li>• All systems rely on electricity for operation and maintain generators for backup power. Generators rely on fossil fuels to operate leading to questions about what systems and services would be prioritized for gasoline/diesel fuel use if there were a disruption to fuel supply. Also, some generators operate on propane or natural gas, neither of which are included in state or federal energy assurance plans.</li><li>• All systems rely on infrastructure (towers, antennae) spread across large areas, often in remote locations. Road access to repair equipment is a primary concern</li><li>• 911 service and other emergency communication relies on line-of-site microwave transmission. Even small changes in antennae alignment can disrupt transmission and require recalibration to re-establish connections between towers. Fiber infrastructure is vulnerable to earthquake damage, in particular where lines are connected to bridge spans.</li></ul>
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**Major Findings:**

- Many providers share infrastructure and or have their infrastructure co-located.
- Stakeholders are well prepared to address winter storms and other disasters as long as there is access to their facilities. Transportation, water, and energy are equally dependent on communication infrastructure. In addition, trees, wind and ice are hazards that can impact this lifeline.
- During a power outage, battery and generator backups provide limited power for a varying duration of time depending on the fuel source and capacity. Redundancy is a needed resource for critical infrastructure that requires access and the supply of multiple fuel types, primarily gasoline and diesel. Notably, propane is a fuel source for some generators; however, propane will not be provided through state resources. Some generators operate on propane or natural gas, neither of which are included in state or federal energy assurance plans.
- All providers anticipate a 75-100% shut-down after a Cascadia event. Due to the roads and bridges being impassable, network connections could be severed.
- Largest barriers to respond in a Cascadia event include: staff ability to respond, access to facilities, shortage of supplies to repair infrastructure, time, funding, and political support.
- Stakeholders recognize that their staff and families need to be prepared. To address this need, they are supporting a proactive approach to disasters. In particular, the Communications sector is working to train employees to be prepared for disasters so they can address their own immediate needs before safely addressing the needs of the sector post-event.
- Some towers have fiber optic lines as a redundancy. However, these lines are vulnerable in a catastrophic earthquake, in particular where lines are connected to bridge spans.
- Water infrastructure systems rely on communication for operations and maintenance through a "Supervisory Control and Data Acquisition" (SCADA) system. The system provides remote monitoring and control of the water system components. Radio system capability is needed for these systems to operate effectively. Much of this infrastructure is isolated. For example, Salem's infrastructure is located on an island.
- Amateur Radio provides critical back up to public safety radio communications in a disaster, but does not provide the necessary capacity to meet emergency management needs. Jurisdictions should consider investing in satellite voice and data capabilities.
- Local servers may be damaged in an earthquake. Jurisdictions should consider "cloud based" data storage solutions to backup vital records.

## Introduction

Communication is an essential aspect of virtually all public and private sector activities. The ability to communicate is especially critical during an emergency. Notably, FEMA's Emergency Support Function #2 – Communications specifically supports the restoration of communications infrastructure. The scope of ESF #2 includes, "restoration of public communications infrastructure" and assisting "State, tribal, and local governments with emergency communications and restoration of public safety communications systems and first responder networks."<sup>5</sup>

This assessment focuses on (1) the adaptive capacity of the communications sector, (2) hazard-specific vulnerabilities to communication infrastructure, and (3) mitigation opportunities that can support uninterrupted or rapid restoration of communication capability during or following emergency or disaster event.

## Primary Agencies and Organizations

The following organizations and agencies participated in this assessment:

- Capital Community Television (CCTV)
- Amateur Radio Emergency Service (ARES)
- Marion Area Multi-Agency Emergency Telecommunications Dispatch Center (METCOM 911)
- Santiam Canyon Phone
- Willamette Valley Communications Center (WVCC)
- Frontier
- Verizon
- Oregon Statewide Inoperability Coordinator (SWIC)
- Service Master of Salem
- Pacific Gas and Electric Company (PGE)

## Sector Description

The communication sector consists of many primary infrastructure components, including microwave and radio frequency antennas, cable and fiber optic lines, routers, switches, and more.

Many communication providers share infrastructure, poles and lines, or have their infrastructure collocated. Additionally, energy providers often share poles and wires with communication providers. While local private-sector communication providers often have emergency response agreements with their national or parent organization (e.g. Frontier and Verizon) most public sector communication providers (e.g. ARES and METCOM 911) have to maintain and repair their own networks in the event a hazard disrupts service.

A point heavily emphasized to the project team, particularly by METCOM 911 (which dispatches and maintains communication links for 29 different agencies throughout Marion County), is that their entire network is connected through microwave transmission. This infrastructure relies on networks of relay stations that require line-of-site connections to operate. Therefore, a single

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<sup>5</sup> FEMA, Emergency Support Function #2 – Communications Annex. 2008.  
<https://www.fema.gov/pdf/emergency/nrf/nrf-esf-02.pdf>.

point failure resulting from a loss of relay station alignment could mean that a large portion of the network is down until the facility can be accessed and repaired.

Additionally, some communication providers have systems that rely on selective routing. This means that their cell towers send signals to an electric router in Portland and then back to Marion County. The providers who use this method have limited control over this portion of the process until it reaches their facility. For those who use or can access C4 routing, 80 percent of the calls are wireless.

The HAM/amateur radio network (ARES) utilizes VHF/UHF technology. VHF/UHF utilizing a repeater enables communication ranges of 100+ miles; HF facilitates communication from 100+-3000+ miles w/o a repeater. There are 100 or more repeaters across the state, which are managed through the State Repeater Coordinating Council, an independent HAM radio body. The channels are open and are non-secure. However, the HAM radio network can establish repeater sites, which allow the portable network to link over hills and create a statewide network that can be linked remotely with radio. These radio repeaters are often collocated with 911 towers and have a battery life of six to twelve hours. Some operators have cross band repeaters, which can extend their communication range anywhere from three to forty miles, depending on where repeaters are placed. HAM radios can also use digital signals and non-voice communication, which sends information in a format similar to email. At this moment, there is a long waiting list for volunteers to access a limited number of frequencies. Locations and frequencies are managed on a first come, first serve basis through the State Repeating Coordinating Council.

## Adaptive Capacity

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Adaptive Capacity refers to a system's ability to accommodate a new or changing environment, exploit beneficial opportunities, or moderate negative effects.

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In general, the communications sector exhibits a high degree of adaptive capacity. This is primarily the result of the diverse and redundant nature of communication infrastructure. For example, sector stakeholders indicated that much of the communication equipment is redundant across the system. Further, many of the systems components (e.g. towers, switches, etc.) have both primary and secondary power sources. This facilitates signal rerouting when needed. Further, the mix of deployed technologies, public and private sector vendors, and redundant equipment all contribute to the sector's ability to adapt to a range of potential impacts.

Within specific geographic areas (such as the Santiam canyon) or infrastructure components (e.g. cable), some adaptive capacity is lost. Participants reported that this is primarily due to single points of failure or lack of redundant equipment.

## System Vulnerabilities

The assessment team evaluated the communication sector's vulnerability using a scenario planning approach which included one chronic event (winter/ice storm) and a catastrophic event (9.0 Earthquake).

## Interdependencies

Systems of all types are dependent on other systems in order to function. In order to operate, the communication sector is particularly dependent on:

### Energy: Electricity and Fuel

Communication equipment requires power to operate. If the power grid is down and backup power is not available through generators, batteries or other sources, system components will not function. During a power outage, battery and generator backups provide limited power for a varying duration of time depending on the fuel source and capacity. Energy redundancy is a needed resource for critical infrastructure that requires access and the supply of multiple fuel types, primarily gasoline and diesel. Notably, propane is a fuel source for some generators; however, propane will not be provided through state resources.

### Transportation

Sector stakeholders indicated that if they can get repair crews, equipment and power to their system components, they can generally restore service quickly. However, many system components are located in remote locations with limited access under normal circumstances. Any disruption to the transportation network can limit or delay restoration of the communication network. Further, where communication infrastructure is collocated within the transportation network (e.g. buried cable within a road right-of-way); damage to the transportation facility can disrupt communication service.

### Water

Water infrastructure systems rely on communication for operations and maintenance through a "Supervisory Control and Data Acquisition" (SCADA) system. The system provides remote monitoring and control of the water system components. Radio system capability is needed for these systems to operate effectively. Much of this infrastructure is isolated. For example, Salem's infrastructure is located on an island.

## Vulnerabilities

### Chronic Hazard: Winter/Ice Storm

Many stakeholders indicated that they are well prepared to address winter storms. Winter storms are common in the region and communication providers have significant experience maintaining and repairing infrastructure during such events. Further, the Communications sector actively mitigates storm related impacts through ongoing risk reduction actions. For example, communication service providers often partner with utility providers to trim trees near above-ground communication lines. Downed trees were also a concern and therefore, monitoring tree health and stability is a part of this maintenance program.

Another factor that may affect addressing the impacts of a winter storm on service is the ability of communication agencies to access critical facilities and infrastructure via roads. While this is a minor concern, as Marion County Public Works have a number of snow plows and snow cats, many communications providers recalled the 2008 winter storm in which Interstate 5 was largely inaccessible. However, this can be remedied by the ability to take alternative routes and if necessary, using snow chains or snowmobiles to access sites. That being said, residents of Marion County who live in rural areas may experience communications outages for up to a week until utility providers can repair their systems.



Power disruptions are also a concern for this sector because their ability to deliver service and respond to emergencies is contingent on consistent access to power. If the power goes out, there are limited battery backup and available generators, which could generate power for up to ten hours. For example, Frontier stated that while rural facilities have batteries, they do not have portable generators and teams must travel to those facilities to deploy emergency generators. Yet, many providers have disaster checklists and train their staff on how to implement their internal and external crisis communications plans. Their reaction depends on the size of the storm and providers have the capability to scale up or down as needed. Additionally, restoring communications is prioritized based on the importance of the infrastructure. Ensuring hospitals, police and fire departments, and other critical community assets have access to communications is prioritized over restoring residential communications.

Another concern in regard to a winter storm is that those who work for communications providers may not live nearby and therefore could have trouble getting to work. This means that these providers may be working with limited staff, making it more difficult to restore and maintain operations. Although some providers do require their staff to have emergency kits at home, this is implemented on an ad hoc basis.

## **Catastrophic Hazard: Cascadia Earthquake Event**

There was overwhelming consensus that the communication sector in general is not adequately prepared for a Cascadia earthquake event. Many expressed a range of concerns, including:

- “The State of Oregon is unprepared. DOGAMI mentions almost every bridge and road. Salem does have several mobile-com centers, which is the only positive.”
- “Nobody knows. It depends on how devastating [Cascadia is].”
- “It would cost millions to replace the system. Equipment replacement would be costly and would take weeks to acquire the necessary replacements.”
- “We have a lack of redundancy in the communication system. There is a time delay to activate backup systems and we have a training deficiency.”

Every provider and agency in the meeting is anticipating a 75 to 100 percent shutdown in operations in the event of a Cascadia earthquake. While many are taking steps to prepare for Cascadia, these efforts are slow moving and limited by a variety of factors. Steps that have been taken or are being taken to reduce vulnerability to a Cascadia earthquake event include:

- Plans for system improvements to infrastructure over next fifty years
- Establishing similar timing and synchronism with other sectors
- Developing a standard set of planning assumptions
- Implementing a system for fuel coordination with other communications agencies and ensuring that sites have an emergency fuel supply
- Each entity will take on the responsibility of re-establishing a priority system or infrastructure piece

The biggest barriers for adequately responding to a Cascadia earthquake event include:

- Lack of regulations and decision-making protocol,
- Funding for operations and maintenance (particularly for public systems),
- Access to capital for mitigation activities, and
- Political will to prioritize mitigation activities.

While there are limited state and federal resources, these are not always readily accessible or easy to obtain due to availability or priority.

One of the largest concerns raised by the group was the lack of coordination across the sector. The mix of public, private, and volunteer entities compounds the issue. Sector participants indicated that there are very few conversations focused on building partnerships and relationships within the communications sector. For many, the sector meeting was the first time they had met or talked to representatives from other agencies, companies or groups. The group agreed that coordinated partnership building and collaboration will be necessary in order to mitigate hazard impacts across the sector. This is particularly true in the case of planning for a Cascadia earthquake event. Building partnerships also provides an opportunity to pool resources and potentially labor, especially since many of the agencies and organizations that were interviewed have collocated facilities.

Another concern was the ability to maintain service in the event of a hazard. Many discussed the importance of determining how to access locations that are blocked in the event of a hazard; how to maintain critical service connections, particularly after a catastrophic event; how to get signals out if landlines are disrupted; and, how to get labor from facilities and out to citizens. Further, sector representatives anticipate that they will experience staff shortages following an event.

Other concerns included education and outreach, particularly on educating the public on what is an emergency and what isn't. Moreover, organizations, such as ARES, struggle with recruiting new volunteers and training individuals on HAM radio operation. Additionally, while they do have a volunteer base, they lack equipment.

## Mitigation Opportunities

The communications sector representatives identified a number of potential mitigation opportunities.

### Joint Utility Liaison

Sector representatives indicated that creating a Joint Utility Liaison position could be an important first step in promoting coordination. The purpose of the position would be to share information across sector providers and coordinate regular meetings. Many representatives indicated that the primary value of the risk assessment process was the simple act of sitting down together to discuss the issues – system vulnerabilities, mitigation priorities and lessons learned. However, the group noted that “meeting for the sake of meeting” would not be productive. Further, the group indicated that regular coordination was unlikely without a person dedicated to coordinating sector stakeholders and facilitating the discussion. The group expressed support for a quarterly meeting schedule.

This action was deemed a high priority by the communication sector participants. When this action is implemented with the communication sector, CPW recommends instituting a facilitation approach such as the Purdue University “[Strategic Doing](#)” model.<sup>6</sup> Strategic Doing, “teaches groups how to form collaborations quickly, move them toward measurable outcomes and make adjustments along the way.” The model is intended to design and guide networks that generate innovative solutions. With Strategic Doing, people:

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<sup>6</sup> Strategic Doing is, “a new strategy discipline specifically designed for open, loosely-connected networks. Unlike strategic planning that was designed primarily to guide strategic activity in hierarchical organizations, Strategic Doing is designed for situations in which nobody can tell anybody else what to do. Collaboration is the only way to move forward.”

- Link and leverage their assets to create new opportunities
- Convert high-priority opportunities into measurable outcomes
- Define pathfinder projects that move toward these outcomes

In short, the Strategic Doing is designed for open, loosely connected networks like what currently exists within the communications lifeline sector in Marion County.

### Special Communication District

Because funding was cited as an issue (particularly for public agency representatives) some stakeholders suggested exploring the feasibility of a Communication District. The purpose of the district would be to generate funds needed for ongoing system maintenance, equipment modernization and hazard mitigation activities (such as site hardening, redundant power supplies and training).

### FirstNet Resources

Signed into law as part of the February 22, 2012 Middle Class Tax Relief and Job Creation Act, the First Responder Network Authority (FirstNet) has a mission to, “build, operate and maintain the first high-speed, nationwide wireless broadband network dedicated to public safety.”<sup>7</sup> The FirstNet vision is to provide a single interoperable platform for emergency and daily public safety communications. Marion County communication sector representatives support mitigation actions that leverage FirstNet funding to support the “hardening” of local communication infrastructure. This approach would meet FirstNet’s task to leverage existing telecommunications infrastructure and assets. The approach also includes the exploration of public/private partnerships, which is consistent with the Joint Utility Liaison approach advocated above.

### Leverage Department of Energy Clear Path IV Exercise and ESF 12

The Department of Energy is facilitating a series of exercises across the nation to address hazard impacts and other challenges to the energy sector. Because the communications sector is so heavily dependent on electricity and fuel (primarily gasoline and diesel), stakeholders indicated that participation in the Clear Path IV Cascadia Subduction Zone (CSZ) exercise could help focus attention on needed public/private sector collaboration.

UPDATE: ClearPath IV occurred April 19-20, 2016. Marion County participated directly in the exercise. While communication sector stakeholders are not specifically listed in the exercise participant list, one of the key recommendations includes improved coordination with, “agencies and organizations providing critical services in support of energy restoration.”<sup>8</sup>

### Training

Participants identified the need for additional training of staff and personnel. In some cases, there are limited numbers of technicians with the expertise needed to repair specific communication components. Further, the number of HAM operators is declining. Finally, fewer young people are entering the communication trades. Stakeholders expressed a need for additional training of the existing workforce, as well as the need to encourage new interest in the industry.

### Coordinate Planning Assumptions

<sup>7</sup> <http://www.firstnet.gov/about>

<sup>8</sup> U.S. Department of Energy. *Clear Path IV Energy-Focused Disaster Response Exercise – Exercise Summary Report*. 2016.  
[http://energy.gov/sites/prod/files/2016/08/f33/ClearPathIV\\_Exercise%20Summary%20Report\\_Public%20Release.pdf](http://energy.gov/sites/prod/files/2016/08/f33/ClearPathIV_Exercise%20Summary%20Report_Public%20Release.pdf)

Communication sector stakeholders indicated that agreement about hazard planning assumptions is needed. While there was general consensus about the range of vulnerabilities across the sector, assumptions about specifics varied. Stakeholders identified energy availability (including fuel), staff/personnel availability, and infrastructure impacts as potential planning topics that could benefit from shared understanding for planning purposes.

### Networks

The primary theme in the assessment of the communication sector was the critical importance of networks. Because of the interconnected nature of communication technology and the sector's reliance on energy and transportation, as well as its critical importance to the water system, developing and maintaining relationships was identified as a critical strategy. Stakeholders reinforced the importance of pre-event relationship building. This can only occur through regular interaction, common operating assumptions and co-production of strategy options. Using a State Homeland Security Grant, Marion County will develop a Marion County Communications Plan in FY17-18. This planning will provide an opportunity to develop a comprehensive strategy to build capability and mitigate vulnerabilities as well as sustain further stakeholder engagement.

# Appendix E: Economic Analysis of Hazard Mitigation Projects

This appendix was developed by the Oregon Partnership for Disaster Resilience at the University of Oregon's Community Service Center. 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 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 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 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 Military Department – Office of Emergency Management (OEM), the Federal Emergency Management Agency, 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 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, in order 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.

## 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 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 on the basis of 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 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?
- Is there equity issues involved that would mean that one segment of the community are 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 in light of 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.

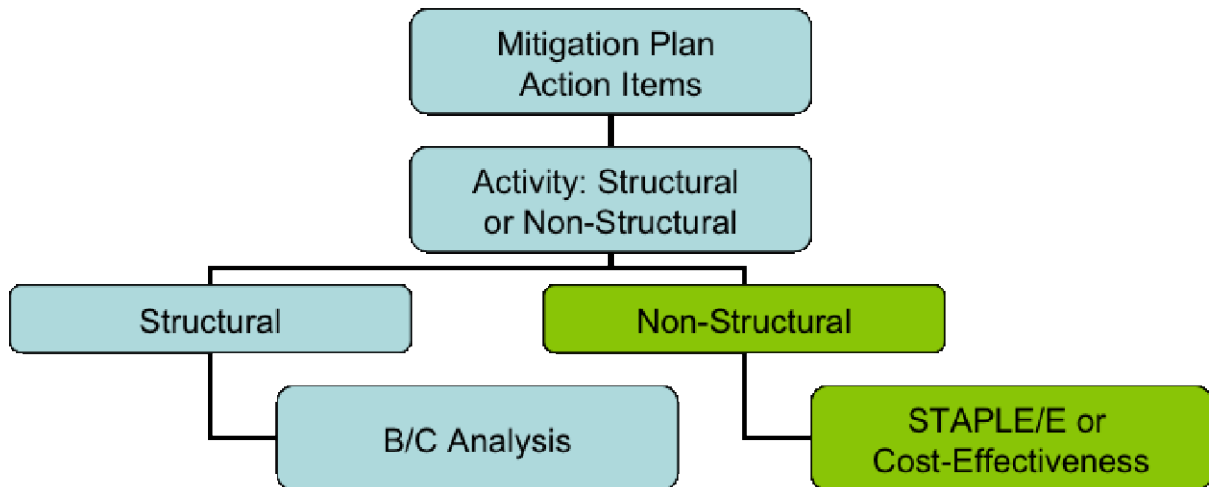
- How will the action impact the environment?
- Will the action need environmental regulatory approvals?
- Will it meet local and state regulatory requirements?
- Are endangered or threatened species likely to be affected?

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-1 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 or not 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 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 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 on the basis of 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 Hazard Mitigation

The estimation of economic returns, which accrue to building or land owners as a result of 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 a period of time.

## Additional Costs from Hazards

Property owners should also assess changes in a broader set of factors that can change as a result of a large 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 disasters in order 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 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 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 hazard mitigation with projects related to watersheds, environmental planning, community economic development, and small business development, among others. Incorporating 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.

# APPENDIX F: GRANT PROGRAMS AND RESOURCES

## Introduction

There are numerous local, state and federal funding sources available to support hazard mitigation projects and planning. The Oregon Natural Hazard Mitigation Plan includes a comprehensive list of funding sources (refer to Oregon NHMP Chapter 2 Section F (1)). 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. <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

### Pre-Disaster Mitigation Grant Program

The Pre-Disaster Mitigation (PDM) 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. PDM grants are to be awarded on a competitive basis and without reference to state allocations, quotas, or other formula-based allocation of funds. <http://www.fema.gov/pre-disaster-mitigation-grant-program>

## 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 FY13 Hazard Mitigation Assistance Unified Guidance, available at: <https://www.fema.gov/media-library/assets/documents/33634>. Note that guidance regularly changes. Verify that you have the most recent edition.

For Oregon Military Department, Office of Emergency Management (OEM) grant guidance on Federal Hazard Mitigation Assistance, visit: [http://www.oregon.gov/OMD/OEM/pages/all\\_grants.aspx - Hazard\\_Mitigation\\_Grants](http://www.oregon.gov/OMD/OEM/pages/all_grants.aspx - Hazard_Mitigation_Grants)

Contact: Dennis Sigrist, [dennis.sigrist@oem.state.or.us](mailto:dennis.sigrist@oem.state.or.us)

## State Programs

### 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 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](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](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 Digital Orthophoto Program, DOI – USGS

Develops topographic quadrangles for use in mapping of flood and other hazards. <http://www.ndop.gov/>



## 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/](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](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](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-HCFPGrants.html>

### Public Assistance Grant Program, FEMA.

The objective of the Federal Emergency Management Agency's (FEMA) Public Assistance (PA) Grant Program is to provide assistance to 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](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/>