

Appendix A Action Items

Action Items Overview

This Appendix contains information on mitigation actions taken and being considered. For more specific information regarding Action Items and how they were prioritized see Section 3 of the Mitigation Plan. The list of Action Items is only a small snap-shot of the wide variety of mitigation activities that have been completed or are underway in the City.

Mitigation Plan Goals

The Action Items relate to the four goals established for the mitigation plan:

1. Protect human life, commerce, property, and natural systems.
2. Ensure Implementation of Mitigation Activities.
3. Enhance Emergency Services.
4. Improve Partnerships for Communication and Coordination.

Multi-Hazard Mitigation Action Items

In addition to the hazard specific action items, there are activities that cut across more than one of six hazards in the mitigation plan: flood, severe weather - wind, severe weather – winter storm, landslide, earthquake and volcanic eruption.

Existing Mitigation Activities

Existing mitigation activities include current mitigation programs and activities that are being implemented by city, county, regional, state, federal agencies, utilities or other organizations. The list below represent some of the existing mitigation activities in the City and is not intended to be an all-inclusive list:

- Building Code <https://www.codepublishing.com/OR/Beaverton/#!/Beaverton08/Beaverton08.html>
- 2019 Engineering Design Manual and Resources <https://www.beavertonoregon.gov/2246/2019-Engineering-Design-Manual-and-Resou>
- Capital Improvement Program <https://www.beavertonoregon.gov/225/Capital-Projects>
- Development Code <https://www.beavertonoregon.gov/463/Development-Code>
- Comprehensive Plan <https://www.beavertonoregon.gov/461/Comprehensive-Plan>
- Public Works - Urban Forestry Maintenance <https://www.beavertonoregon.gov/1095/Urban-Forestry>

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- Public Works - Snow/Ice Emergency Management Plan
<https://www.beavertonoregon.gov/451/Winter-Sanding-Routes>
- Water Master Plan – Includes seismic resilience evaluations and capital improvement program
https://beaverton.granicus.com/MetaViewer.php?view_id=2&clip_id=2006&meta_id=107832

Possible Actions

Each action item includes ideas for implementation; “Possible Actions.” These possible actions are only suggestions for ways to implement the plan goal. They serve as a starting point and are dynamic as some ideas may be not feasible and new ideas can be added during the plan maintenance process. Some of these items may prove to be unrealistic and others more refined ideas may be identified and added to the plan.

Completed Activities and Action Items

This section identifies specific projects and activities that were completed since the last plan update.

Completed Projects and Activities not specified in the NHMP

These are some of the mitigation projects and activities that were completed but were not part of the Action Items originally identified in this plan. This is not an all-inclusive.

- Storm Drain Awareness Murals <https://www.beavertonoregon.gov/2073/Storm-Murals>.
- Storm Ready Community <https://www.weather.gov/stormready/or-sr>.
- Right-of-Way Improvements for Stormwater Management <https://www.beavertonoregon.gov/1466/Projects-Completed>.
- Hocken Ave improvements (included replacing two culverts with a bridge to reduce flooding).
<https://www.beavertonoregon.gov/DocumentCenter/View/9771/Hocken-Avenue-Project-FAQs?bidId=>.
- Seismic Resilience Evaluation of the City’s water system including critical customers and critical facilities (See Chapter 6 of the Water Master Plan).
- GIS Analysis of ages of buildings in Beaverton relative to major changes to the building code related to seismic hazards.
- GIS Analysis of commercial properties in Beaverton in the floodplain.

Completed Action Items

The table on the next page is a summary of the items that have been completed or closed by the NHMP Steering Committee since the plan was originally written.

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Table A-1: Close and Completed Action Items

Natural Hazard Item	Priority Score	Original Action Item	Comments
Long-Term Multi-Hazard #4	18	Improve public awareness and provide potential steps to reduce natural hazard risk.	Completed – City’s Emergency Management website has been updated, regular preparedness articles are published in Your City newsletter, preparedness presentation are given to wide variety of audiences including staff at assisted living facilities. Example: https://www.beavertonoregon.gov/576/Mitigation
Long-Term Multi-Hazard #2:	18	Implement appropriate mitigation measures at development sites prior to approval.	Completed – Contained in existing City Codes and plans including: <ul style="list-style-type: none"> • Development Code https://www.beavertonoregon.gov/463/Development-Code • Comp Plan https://www.beavertonoregon.gov/461/Comprehensive-Plan
Short-Term Multi-Hazard #5	17	Strengthen emergency services by updating the City Emergency Operations Plan, linking emergency services with natural hazard mitigation programs, and enhancing public education.	Completed – The EOP and Hazard vulnerability assessment are updated on a 2-year cycle to comply with State and Federal standards. The other portions including enhancing public education are standard functions of the Emergency Management Program
Short-Term Multi-Hazard #1	14	Establish a Beaverton Natural Hazards Mitigation Plan Steering Committee to facilitate implementation, monitoring, and evaluation of citywide mitigation activities.	Completed - This is done as part of the NHMP planning process.
Short-Term Severe Weather #1	12	Maintain public awareness of the hazard and the benefits of mitigation through	Completed – This is part of the City’s overall emergency preparedness education and information

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Natural Hazard Item	Priority Score	Original Action Item	Comments
		education aimed at households and businesses and increase targeting of special needs populations.	activities Example: https://www.beavertonoregon.gov/576/Mitigation
Long-Term Landslide #5	10	Maintain public and private drainage systems.	Completed – Institutionalized in existing City operations and procedures.
Long-Term Earthquake #2	10	Encourage purchase of earthquake hazard insurance by forming partnerships with the insurance and real estate industries.	Closed – Not viable project for the City
Short-Term Severe Weather #2	09	Maintain tree trimming for above ground power lines.	Completed – The City and PGE have effective tree management programs.
Long -Term Severe Weather #4	09	Support underground utility construction through public incentives and partnerships.	Completed – The issue of undergrounding utilities for new development and redevelopment is addressed in State Statute and City Code.
Long -Term Severe Weather #5	09	Develop strategies for better debris removal after a windstorm.	Completed – Strategies were implemented in the 2007 windstorm including a centralized drop off location for woody debris.
Long-Term Landslide #4	09	Implement construction and subdivision design that can be applied to steep slopes to reduce the potential adverse impacts from development.	Completed – Contained in existing City Codes and plans including: <ul style="list-style-type: none"> • Development Code https://www.beavertonoregon.gov/463/Development-Code • Comp Plan https://www.beavertonoregon.gov/461/Comprehensive-Plan
Long-Term Severe Weather #1	09	Identify trees that are potentially susceptible to wind-throw.	Closed – Part of operations of Public Work’s Urban Forestry Maintenance Section https://www.beavertonoregon.gov/1095/Urban-Forestry .

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Natural Hazard Item	Priority Score	Original Action Item	Comments
Long-Term Severe Weather #2	09	Develop and implement programs to keep trees from threatening lives, property, and public infrastructure from severe weather events.	Completed – <ul style="list-style-type: none"> • Approved Tree list - https://www.beavertonoregon.gov/442/Approved-Tree-List • Planting and Maintenance Police https://www.beavertonoregon.gov/1922/Tree-Planting-Maintenance-Policy
Short-Term Flood #1	08	Evaluate the requirements for Beaverton to become a participant in the NFIP's Community Rating System (CRS).	Closed – It was determined by the Flood Plain Manager that the city would not be participating in the CRS.
Long-Term Flood #4	08	Use storm water and urban design best management practices (BMPs).	Closed – Covered in: <ul style="list-style-type: none"> • Comp Plan https://www.beavertonoregon.gov/461/Comprehensive-Plan • Development Code https://www.beavertonoregon.gov/463/Development-Code • Engineering Design Manual https://www.beavertonoregon.gov/232/Engineering-Design-Manual
Long-Term Flood #3	08	Enhance data and mapping for floodplain information within the City.	Closed <ul style="list-style-type: none"> • Public Works maintains a list of problem catch basins and grates that is used when preparing for heavy rains and for monitoring during major rain events. • City GIS does not maintain map layers relative to streams. They use regionally generated layers provided by Clean Water Services and Metro.

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Natural Hazard Item	Priority Score	Original Action Item	Comments
Long-Term Volcano #1	07	Map and model ash fall.	Closed - Modeling during an event and for planning is available through the USGS https://vsc-ash.wr.usgs.gov/ashgui/#/ .

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On-going Action Items

There are several Action Items that are considered “On-going.” On-going Action Items are by nature continuous or actions that are being worked on; but are not to the point where they are fully incorporated into City operations, plans, or regulations.

On-going Action Items are listed by priority; from the highest to the lowest regardless of the hazard.

Possible Actions

Each action item includes ideas for implementation. Possible actions serve as a starting point and are dynamic as some ideas may be not feasible and new ideas can be added during the plan maintenance process. These possible actions are only suggestions for ways to implement the plan goal. Some of these items may prove to be unrealistic and others more refined ideas may be identified and added to the plan.

Natural Hazard Item	Priority Score	Timeline	Alignment with Plan Goals:			
Short-Term Multi-Hazard #3	18	<input checked="" type="checkbox"/> On-going <input type="checkbox"/> Current Cycle <input type="checkbox"/> Future Cycle	<input checked="" type="checkbox"/> 1 Protect	<input checked="" type="checkbox"/> 2 Ensure	<input type="checkbox"/> 3 Enhance	<input checked="" type="checkbox"/> 4 Improve
Action Item:						
Develop public and private partnerships to foster natural hazard program coordination and collaboration within the Beaverton Urban Service Boundary.						
Possible Actions:						
a. Identify and develop partnerships with organizations (public and private) that have programs or interests in natural hazards mitigation to implement specific mitigation projects. b. Establish neighborhood emergency service and mitigation volunteer teams to collaborate with Beaverton Emergency Management. c. Develop formal collaborations with businesses in the City. d. Develop cross-jurisdictional agreements to ensure regional implementation of mitigation activities. e. Create a database of key contacts for each sector, including the public, private, and non-profit sectors. f. Identify and establish incentives for people to participate in mitigation activities.						

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Coordinating Organization:	City of Beaverton		
Internal Partners:	External Partners:		
Emergency Management, Community Development Department Neighborhood Program	Utility providers, School District, Chamber of Commerce, Community Organizations, Washington County, Clean Water Services, Cooperating Public Agencies of Washington County		
Action Item Status:	<ul style="list-style-type: none"> • The City has CERT and Map Your Neighborhood programs in place. • We are coordinating with Washington County and other cities to do a multi-jurisdiction mitigation plan for 2022. 		

Natural Hazard Item	Priority Score	Timeline	Alignment with Plan Goals:			
Long Term Multi-Hazard #3:	18	<input checked="" type="checkbox"/> On-going <input type="checkbox"/> Current Cycle <input type="checkbox"/> Future Cycle	<input checked="" type="checkbox"/> 1 Protect	<input checked="" type="checkbox"/> 2 Ensure	<input type="checkbox"/> 3 Enhance	<input checked="" type="checkbox"/> 4 Improve
Action Item:						
Create and maintain a system to support populations with special needs within Beaverton's city limits.						
Possible Actions:						
a. Maintain and update preparedness information aimed at vulnerable populations. b. Create a neighbor-to-neighbor network of voluntary organizations that will assist senior, disabled persons, and non-English speakers during disasters. c. Identify and create an information database on the location of centers with major concentrations of seniors, persons with disabilities (e.g., senior housing facilities and assisted living centers), minorities, and low-income residents, and develop strategies for notification and support of their evacuation.						
Coordinating Organization:	City of Beaverton					
Internal Partners:	External Partners:					
ISD/GIS, Community Development Department, Emergency Management, Neighborhood Program	DHS, OEM, FEMA, local non-profit service providers (i.e., SDRI)					

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Action Item Status:	<ul style="list-style-type: none"> • We partnered with SDRI to provide preparedness information and presentation to their clients and service providers. • Involved in addressing findings in a federal grant funded report evaluating how participants in the RDPO are meeting the needs of PWD/AFN via their existing emergency management programs. • Added a module in our Basic CERT Course on working with people who have access and functional needs.
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Natural Hazard Item	Priority Score	Timeline	Alignment with Plan Goals:			
Short Term Multi-Hazard #2:	17	<input checked="" type="checkbox"/> On-going <input type="checkbox"/> Current Cycle <input type="checkbox"/> Future Cycle	<input checked="" type="checkbox"/> 1 Protect	<input checked="" type="checkbox"/> 2 Ensure	<input type="checkbox"/> 3 Enhance	<input type="checkbox"/> 4 Improve
Action Item:						
Identify and pursue funding opportunities to develop and implement local mitigation activities.						
Possible Actions:						
a. Allocate City resources and assistance to mitigation projects when possible. b. Explore mitigation-related funding sources (such as FEMA Pre-Disaster Mitigation Competitive Grant Program). c. Explore non-mitigation related funding sources (such as Green space bond measure and Community Development Block Grants and others). d. Develop incentives for local organizations (such as Neighborhood Associations and Neighborhood Action Committees), citizens, and businesses to pursue hazard mitigation efforts. e. Partner with other organizations and agencies in Washington County to identify grant programs and foundations that may support mitigation activities and together seek funding for mitigation projects.						
Coordinating Organization:	City of Beaverton					
Internal Partners:			External Partners:			
Emergency Management, Community Development Department Neighborhood Program			Clean Water Services, Westside Economic Alliance, Tualatin River Watershed Council, Washington County, Cooperating Public Agencies of Washington County, US Department of Housing and Urban Development, FEMA			

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Action Item Status:	<ul style="list-style-type: none"> Potential funding sources for various mitigation related projects are always considered.
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Natural Hazard Item	Priority Score	Timeline	Alignment with Plan Goals:			
Long-Term Multi-Hazard #1	17	<input checked="" type="checkbox"/> On-going <input type="checkbox"/> Current Cycle <input type="checkbox"/> Future Cycle	<input checked="" type="checkbox"/> 1 Protect	<input checked="" type="checkbox"/> 2 Ensure	<input type="checkbox"/> 3 Enhance	<input type="checkbox"/> 4 Improve

Action Item:

Increase technical knowledge of natural hazards and mitigation strategies in Beaverton and implement policies and program based on that knowledge.

Possible Actions:

- a. Maintain and update hazard vulnerability maps (On-going).
- b. Create and maintain a GIS inventory map of historic hazard events that documents: location, impacts, loss, etc.
- c. Maintain a GIS inventory including, but not limited to: critical and essential facilities, large employers, building stock, public assembly areas and essential facilities (Completed).
- d. Utilize spatial analysis tools to evaluate the City's vulnerability.

Coordinating Organization:	City of Beaverton
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Internal Partners:	External Partners:
ISD/GIS, Public Works, Emergency Management, Community Development Department	Washington County, DOGAMI, DLCD, OSFM, ODF, OEM, Utilities, ODOT, METRO

Action Item Status:	<ul style="list-style-type: none"> Hazard layers and maps are regularly updated. DOGAMI's new data relative to the potential impacts of a subduction zone and Portland Hills fault earthquakes have been incorporated. Building inventory is completed including critical and essential facilities. Maps have been created with building ages relative to changes in seismic code and identifying commercial buildings in floodplains that might not be able to rebuild after a disaster because of changes in the floodplain codes.
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Natural Hazard Item	Priority Score	Timeline	Alignment with Plan Goals:			
Short-Term Multi-Hazard #4	15	<input checked="" type="checkbox"/> On-going <input type="checkbox"/> Current Cycle <input type="checkbox"/> Future Cycle	<input checked="" type="checkbox"/> 1 Protect	<input type="checkbox"/> 2 Ensure	<input type="checkbox"/> 3 Enhance	<input type="checkbox"/> 4 Improve
Action Item:						
Encourage households and businesses in Beaverton to consider natural hazard related insurance.						
Possible Actions:						
a. Educate businesses and homeowners on the availability and types of insurance related to natural hazards. b. Partner with insurance companies to promote natural hazard related insurance.						
Coordinating Organization:	City of Beaverton					
Internal Partners:			External Partners:			
Emergency Management, Community Development Department,			Insurance Providers, Chamber of Commerce			
Action Item Status:						

Natural Hazard Item	Priority Score	Timeline	Alignment with Plan Goals:			
Long-Term Earthquake #1	14	<input checked="" type="checkbox"/> On-going <input type="checkbox"/> Current Cycle <input type="checkbox"/> Future Cycle	<input checked="" type="checkbox"/> 1 Protect	<input checked="" type="checkbox"/> 2 Ensure	<input type="checkbox"/> 3 Enhance	<input checked="" type="checkbox"/> 4 Improve
Action Item:						
Establish a program aimed at helping private property owners and businesses perform structural retrofitting.						
Possible Actions:						

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<p>a. Provide information for property owners, small businesses, and organizations on sources of funds (loans, grants, etc.).</p> <p>b. Lobby state legislature to allow for adopting incentives that authorizes property tax incentives or deferrals to offset the costs of voluntary rehabilitation for existing buildings.</p>	
Coordinating Organization:	City of Beaverton
Internal Partners:	External Partners:
Emergency Management, Community Development Department, Mayor's Office, Neighborhood Program	Washington County Assessment and Taxation, State Finance, Federal Emergency Management Agency (FEMA), Beaverton Area Chamber of Commerce, Westside Economic Alliance
Action Item Status:	

Natural Hazard Item	Priority Score	Timeline	Alignment with Plan Goals:			
Short-Term Earthquake #2	13	<input checked="" type="checkbox"/> On-going <input type="checkbox"/> Current Cycle <input type="checkbox"/> Future Cycle	<input checked="" type="checkbox"/> 1 Protect	<input checked="" type="checkbox"/> 2 Ensure	<input type="checkbox"/> 3 Enhance	<input type="checkbox"/> 4 Improve
Action Item:						
Reduce non-structural hazards in homes, schools, businesses, and government offices.						
Possible Actions:						
<p>a. Provide training to government and school facility managers and teachers on securing bookcases, filing cabinets, light fixtures, and other objects that can cause injuries and block exits.</p> <p>b. Encourage facility managers, business owners, and teachers to refer to FEMA's practical guidebook: Reducing the Risks of Nonstructural Earthquake Damage.</p> <p>c. Organize retrofitting classes for homeowners, building professionals, and contractors.</p>						
Coordinating Organization:	City of Beaverton					
Internal Partners:	External Partners:					
Emergency Management, Community Development Department	Washington County, Federal Emergency Management Agency, Oregon Emergency Management, School District					

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Action Item Status:	<ul style="list-style-type: none"> We do provide schools, daycares and businesses with recommendations on non-structural risks and possible mitigation measures. We have added structural and non-structural information to the emergency management website https://www.beavertonoregon.gov/576/Mitigation
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Natural Hazard Item	Priority Score	Timeline	Alignment with Plan Goals:			
Long-Term Earthquake #4	10	<input checked="" type="checkbox"/> On-going <input type="checkbox"/> Current Cycle <input type="checkbox"/> Future Cycle	<input checked="" type="checkbox"/> 1 Protect	<input type="checkbox"/> 2 Ensure	<input type="checkbox"/> 3 Enhance	<input type="checkbox"/> 4 Improve
Action Item:						
Improve local capabilities to perform earthquake building safety evaluations.						
Possible Actions:						
a. Offer training in procedures for earthquake building safety evaluations to CERT volunteers through Beaverton’s new Community Emergency Response Team Program. b. Offer periodic training in ATC-20 and ATC-21 procedures for earthquake building safety evaluations and encourage local building officials and other public and private officials (facilities, maintenance, engineering, and architects) to attend.						
Coordinating Organization:	City of Beaverton					
Internal Partners:			External Partners:			
Emergency Management, Community Development Department			Federal Emergency Management Agency (FEMA), Oregon Emergency Management (OEM), Washington County EMC, RDPO			
Action Item Status:	<ul style="list-style-type: none"> CERT members have been trained in the County-wide post-earthquake rapid damage assessment procedures for critical and essential facilities and have participated in exercises testing those procedures. ATC – 20 and 21 course are routinely hosted in the Metro Area by Washington County, Portland, OEM and the RDPO. There is legislation at the State level looking at increasing the pool of people who can be certified and trained to conduct post-earthquake damage assessments. 					

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Natural Hazard Item	Priority Score	Timeline	Alignment with Plan Goals:			
Long-Term Earthquake #3	10	<input checked="" type="checkbox"/> On-going <input type="checkbox"/> Current Cycle <input type="checkbox"/> Future Cycle	<input checked="" type="checkbox"/> 1 Protect	<input type="checkbox"/> 2 Ensure	<input type="checkbox"/> 3 Enhance	<input type="checkbox"/> 4 Improve
Action Item:						
Develop public/private partnerships to pursue efficient methods to retrofit structures.						
Possible Actions:						
a. Develop incentives (tax incentives or public recognition) for private contractors and architects to work on retrofitting public buildings and other infrastructure. This may help to minimize the funding shortage issue that has caused a number of high risk sites to remain without retrofitting. b. Educate building contractors and architects on seismic design principles.						
Coordinating Organization:	City of Beaverton					
Internal Partners:			External Partners:			
Emergency Management, Community Development Department, Mayor's Office			Home Builders Association, American Planning Association, American Institute of Architects, Westside Economic Alliance, Chamber of Commerce, Downtown Business Association, and renters groups			
Action Item Status:						

Natural Hazard Item	Priority Score	Timeline	Alignment with Plan Goals:			
Long-Term Severe Weather #3	10	<input checked="" type="checkbox"/> On-going <input type="checkbox"/> Current Cycle <input type="checkbox"/> Future Cycle	<input checked="" type="checkbox"/> 1 Protect	<input type="checkbox"/> 2 Ensure	<input type="checkbox"/> 3 Enhance	<input checked="" type="checkbox"/> 4 Improve
Action Item:						
Develop and maintain comprehensive impact database and when possible, map historical severe weather events in Beaverton.						
Possible Actions:						

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<p>a. Research and analyze historic windstorm damage in Beaverton.</p> <p>b. Identify reoccurring patterns.</p> <p>c. Map reoccurring hazard sites.</p> <p>d. Document future events including impacts and losses.</p>	
Coordinating Organization:	City of Beaverton
Internal Partners:	External Partners:
Emergency Management, Community Development Department, Public Works	Washington County, National Weather Service, National Oceanic and Atmospheric Administration, Oregon Climate Service, Overhead Utilities
Action Item Status:	

Natural Hazard Item	Priority Score	Timeline	Alignment with Plan Goals:			
Long-Term Land Slide #3	10	<input checked="" type="checkbox"/> On-going <input type="checkbox"/> Current Cycle <input type="checkbox"/> Future Cycle	<input checked="" type="checkbox"/> 1 Protect	<input checked="" type="checkbox"/> 2 Ensure	<input type="checkbox"/> 3 Enhance	<input checked="" type="checkbox"/> 4 Improve
Action Item:						
Protect existing development in landslide-prone areas						
Possible Actions:						
<ul style="list-style-type: none"> • Provide information to residents on landslide prevention. Publications such as FEMA’s Homeowner’s Landslide Guide for Hillside Flooding, Debris Flows, Erosion, and Landslide Control and Hillside Drainage Flyer have some ideas about reducing landslide susceptibility. • Encourage easements to restrict certain activities on landslide-prone properties. Easements foregoing the right to develop a property can be either sold or granted to the City or other organizations by property owners. • Investigate land purchasing programs. • Use Transfer of Development Rights to transfer development rights of a landslide hazard area by deed, easement, or other legal instrument authorized by local law to another parcel of land that is not prone to landslides. • Construct debris flow diversions to protect existing properties. • Use and publicize the Oregon Department of Forestry’s debris flow warning system. 						

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Coordinating Organization:	City of Beaverton		
Internal Partners:	External Partners:		
Emergency Management, Community Development Department, Public Works	Department of Land Conservation and Development (DLCD), Oregon Emergency Management (OEM), Federal Emergency Management Agency (FEMA), Washington County		
Action Item Status:			

Natural Hazard Item	Priority Score	Timeline	Alignment with Plan Goals:			
Short-Term Earthquake #3	8	<input checked="" type="checkbox"/> On-going <input type="checkbox"/> Current Cycle <input type="checkbox"/> Future Cycle	<input type="checkbox"/> 1 Protect	<input type="checkbox"/> 2 Ensure	<input checked="" type="checkbox"/> 3 Enhance	<input checked="" type="checkbox"/> 4 Improve
Action Item:						
Pursue structural mitigation of critical facilities, infrastructure, public buildings, and schools for the earthquake threat.						
Possible Actions:						
a. Coordinate with Washington County to identify and retrofit critical facilities, to stricter seismic standards. b. Encourage the state legislature to adopt retrofitting incentives.						
Coordinating Organization:	City of Beaverton					
Internal Partners:	External Partners:					
Emergency Management, Community Development Department, Public Works	School Districts, Special Districts, Hospitals, Washington County, Oregon Department of Transportation (ODOT)					

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Action Item Status:	<ul style="list-style-type: none"> • TVF&R is in the final phase of upgrading stations and support facilities. • BSD is in the middle of upgrading/replacing several schools in the district bringing them to current building standards and in some cases they are building them to a higher seismic standard so they can be a resource post-earthquake. • The City’s new Public Safety Center, which will include Emergency Management and City’s EOC, will be completed late Spring/Early summer of 2020 and is being built to immediate occupancy seismic standards. • Additional components of resiliency are being incorporated into portions of the City’s new performing arts center so that it can be a resource post-earthquake. • The City’s Water Department had a seismic resilience evaluation conducted on the water system. This information is being used in evaluating design standards and future capital improvement projects.
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Natural Hazard Item	Priority Score	Timeline	Alignment with Plan Goals:			
Short-Term Flood #2	8	<input checked="" type="checkbox"/> On-going <input type="checkbox"/> Current Cycle <input type="checkbox"/> Future Cycle	<input checked="" type="checkbox"/> 1 Protect	<input type="checkbox"/> 2 Ensure	<input type="checkbox"/> 3 Enhance	<input type="checkbox"/> 4 Improve
Action Item:						
Analyze each repetitive loss property to identify viable mitigation options.						
Possible Actions:						
a. Use insurance claim data from FEMA and OEM to identify properties in the City that have filed more than one National Flood Insurance Program (NFIP) insurance claim. b. Consider identified properties for mitigation activities. Funding for mitigation may be available through FEMA’s Hazard Mitigation Grant or Flood Mitigation Assistance program. c. Prioritize properties for mitigation activities using a benefit/cost analysis. d. Map and analyze each repetitive loss property to develop appropriate mitigation actions.						
Coordinating Organization:	City of Beaverton					
Internal Partners:				External Partners:		
Emergency Management, Community Development Department, Public Works, ISD/GIS				Oregon Emergency Management, Department of Land Conservation and Development, Federal Emergency Management Agency, Natural Resources Conservation Service		
Action Item Status:	<ul style="list-style-type: none"> • While there are only a few properties with more than one flood insurance claim, mitigating flooding is an on-going activity for the City. 					

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Natural Hazard Item	Priority Score	Timeline	Alignment with Plan Goals:			
Long-Term Flood #1	8	<input checked="" type="checkbox"/> On-going <input type="checkbox"/> Current Cycle <input type="checkbox"/> Future Cycle	<input checked="" type="checkbox"/> 1 Protect	<input type="checkbox"/> 2 Ensure	<input type="checkbox"/> 3 Enhance	<input type="checkbox"/> 4 Improve
Action Item:						
Develop acquisition and management strategies to preserve open space in the floodplain.						
Possible Actions:						
a. Develop a comprehensive strategy for acquiring and managing floodplain open space in Beaverton. b. Explore funding for open space acquisition from federal (e.g., FEMA Hazard Mitigation Grant Program), state, regional, and local governments, as well as private and non-profit organizations. c. Develop a regional partnership between flood mitigation organizations. d. Identify sites where environmental restoration work can benefit flood mitigation, fish habitat, and water quality.						
Coordinating Organization:	City of Beaverton					
Internal Partners:			External Partners:			
Emergency Management, Community Development Department, Public Works,			Oregon Emergency Management, Department of Land Conservation and Development, Federal Emergency Management Agency, Natural Resources Conservation Service			
Action Item Status:	While there are only a few properties with more than one flood insurance claim, mitigating flooding is an on-going activity for the City.					

Natural Hazard Item	Priority Score	Timeline	Alignment with Plan Goals:			
Short-Term Volcano #2	8	<input checked="" type="checkbox"/> On-going <input type="checkbox"/> Current Cycle <input type="checkbox"/> Future Cycle	<input checked="" type="checkbox"/> 1 Protect	<input type="checkbox"/> 2 Ensure	<input type="checkbox"/> 3 Enhance	<input checked="" type="checkbox"/> 4 Improve
Action Item:						
Collaborate with USGS-CVO and related agencies to increase awareness of volcanic response efforts through ash fall related messages.						
Possible Actions:						

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<ul style="list-style-type: none"> Collaborate with USGS-CVO, OCEM, FAA, National Weather Service, law enforcement offices, and the media to develop a warning message framework that is more appropriate for the area so that communities and individuals have a clear sense of how to respond. Continually update information, monitor and track in the event of a volcanic emergency. Educate residents on what to do and where to go in the event of a volcanic event in the Cascades. 	
Coordinating Organization:	City of Beaverton
Internal Partners:	External Partners:
Emergency Management,	United States Geological Survey – Cascades Volcano Observatory (USGS-CVO), Federal Aviation Administration (FAA), Department of Geology and Mineral Industries (DOGAMI), Oregon Emergency Management (OEM), National Weather Service, law enforcement offices, local media, RDPO, Federal Emergency Management Agency (FEMA) Region 10 Volcanic Working Group, Tualatin Valley Fire and Rescue District, School Districts
Action Item Status:	

Natural Hazard Item	Priority Score	Timeline	Alignment with Plan Goals:			
Long-Term Landslide #2	7	<input checked="" type="checkbox"/> On-going <input type="checkbox"/> Current Cycle <input type="checkbox"/> Future Cycle	<input checked="" type="checkbox"/> 1 Protect	<input type="checkbox"/> 2 Ensure	<input type="checkbox"/> 3 Enhance	<input checked="" type="checkbox"/> 4 Improve
Action Item:						
Limit activities in identified landslide hazard areas through regulation and public outreach.						
Possible Actions:						
<ul style="list-style-type: none"> Use the hazard identification and mapping processes to determine where to regulate. Coordinate with property owners to reduce risk in landslide hazard areas. Provide information on hazard location to future residents. Show hazard susceptibility on deeds. 						
Coordinating Organization:	City of Beaverton					
Internal Partners:	External Partners:					

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Emergency Management, Community Development Department	Department of Geology and Mineral Industries (DOGAMI), Washington County
Action Item Status:	<ul style="list-style-type: none"> • LIDAR Mapping showed one ancient landslide that is inside City limits and unincorporated county. • A Hazard Map is posted on the City’s website and it includes the slide areas identified by LIDAR. https://www.beavertonoregon.gov/DocumentCenter/View/874/Natural-Hazards-Map?bidId= • An article in a City newsletter in 2014 identified the natural hazards that could impact Beaverton and included links to the hazard map and to preparedness information.

Natural Hazard Item	Priority Score	Timeline	Alignment with Plan Goals:			
Short-Term Flood #3	6	<input checked="" type="checkbox"/> On-going <input type="checkbox"/> Current Cycle <input type="checkbox"/> Future Cycle	<input type="checkbox"/> 1 Protect	<input type="checkbox"/> 2 Ensure	<input checked="" type="checkbox"/> 3 Enhance	<input type="checkbox"/> 4 Improve
Action Item:						
Develop mitigation and preparedness measures for critical public infrastructure and facilities located in flood hazard areas.						
Possible Actions:						
a. Document in database format as well as in maps the critical facilities that are at risk from flood events. b. Develop strategies to mitigate risk to these facilities, or to utilize alternative facilities should flood events cause damages to the facilities in question.						
Coordinating Organization:	City of Beaverton					
Internal Partners:			External Partners:			
Emergency Management, Community Development Department, GID/ISD			Overhead Utilities Tualatin Valley Water District, Clean Water Services, Washington County			

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Action Item Status:	<ul style="list-style-type: none"> • The hazard and critical facilities map layers already exist and are used in maps including the maps for this plan. The information can be exported into an Excel Spreadsheet. • There is only one critical facility structure currently in the 100 floodplain and that's the current Public Safety Center. Police and Emergency Management will move to the new PS Center in 2020, which is outside the floodplain. • Court will remain in the current building but there is a City COOP plan that addresses loss of facilities.
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Natural Hazard Item	Priority Score	Timeline	Alignment with Plan Goals:			
Short-Term Volcano #1	6	<input checked="" type="checkbox"/> On-going <input type="checkbox"/> Current Cycle <input type="checkbox"/> Future Cycle	<input type="checkbox"/> 1 Protect	<input type="checkbox"/> 2 Ensure	<input checked="" type="checkbox"/> 3 Enhance	<input checked="" type="checkbox"/> 4 Improve
Action Item:						
Identify critical facilities and industries that may be affected by ash fall and collaborate with them on ash fall emergency response.						
Possible Actions:						
<ul style="list-style-type: none"> • Collaborate and exchange experiences and knowledge among facility managers of critical industries in the region to reduce the impact of ash fall on their sites. 						
Coordinating Organization:	City of Beaverton					
Internal Partners:			External Partners:			
Emergency Management, Community Development Department, GID/ISD			Overhead Utilities Tualatin Valley Water District, Clean Water Services, Washington County			
Action Item Status:						

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Current Action Items

Current Action Items are items that will be focused on during the current plan cycle as resources and time permits.

Current Action Items are listed by priority; from the highest to the lowest regardless of the hazard.

Natural Hazard Item	Priority Score	Timeline	Alignment with Plan Goals:			
Long-Term Earthquake #5	11	<input type="checkbox"/> On-going <input checked="" type="checkbox"/> Current Cycle <input type="checkbox"/> Future Cycle	<input checked="" type="checkbox"/> 1 Protect	<input checked="" type="checkbox"/> 2 Ensure	<input type="checkbox"/> 3 Enhance	<input checked="" type="checkbox"/> 4 Improve
Action Item:						
Provide information to Beaverton residents about earthquakes and opportunities to mitigate earthquake hazards in their homes						
Possible Actions:						
a. Enforce seismic building codes. b. Develop educational materials in Tier 1 and Tier 2 languages						
Coordinating Organization:	City of Beaverton					
Internal Partners:			External Partners:			
Emergency Management, Community Development Department, Mayor’s Office,			Federal Emergency Management Agency (FEMA), Oregon Emergency Management (OEM), Partners for Loss Prevention, Washington County			
Action Item Status:	<ul style="list-style-type: none"> • Our Home Hazard Hunt flyer, which includes information on structural and non-structural mitigation for multiple hazards including seismic, are available in Spanish, Arabic, Vietnamese, Mandarin, and Korean. • Information has been regularly sent out in the City’s newsletter addressing the seismic hazards and the need to mitigate. • Seismic Building Codes are enforced. 					

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Natural Hazard Item	Priority Score	Timeline	Alignment with Plan Goals:			
Short-Term Earthquake #4	10	<input type="checkbox"/> On-going <input checked="" type="checkbox"/> Current Cycle <input type="checkbox"/> Future Cycle	<input checked="" type="checkbox"/> 1 Protect	<input type="checkbox"/> 2 Ensure	<input type="checkbox"/> 3 Enhance	<input type="checkbox"/> 4 Improve
Action Item:						
Improve technical data and analysis of earthquake hazards.						
Possible Actions:						
a. Develop and update an inventory of at- risk structures in Beaverton. b. Update Beaverton earthquake HAZUS data to improve accuracy of the vulnerability assessment for Beaverton. c. Encourage local government officials to use Metro’s earthquake hazards reports and earthquake maps to develop additional maps land use documents. d. Conduct risk analysis incorporating HAZUS data and earthquake maps using GIS technology to identify risk sites and further assist in prioritizing mitigation activities and regulating land use.						
Coordinating Organization:	City of Beaverton					
Internal Partners:			External Partners:			
Emergency Management, Community Development Department, ISD/GIS			Portland State University, Washington County, Metro, DOGAMI, RDPO			
Action Item Status:	<ul style="list-style-type: none"> • New Data created by DOGAMI in support of the development of Oregon Resilience plan, and through a grant funded project for the RDPO, a greater level of data is available on the potential impacts of seismic events on the city and region. These data layers are already being used by the City’s GIS Division and Emergency Management Program. • A map layer has been created showing the ages and types of structures (Commercial vs Residential) relative to changes in the seismic codes. 					

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Natural Hazard Item	Priority Score	Timeline	Alignment with Plan Goals:			
Long-Term Landslide #1	7	<input type="checkbox"/> On-going <input checked="" type="checkbox"/> Current Cycle <input type="checkbox"/> Future Cycle	<input checked="" type="checkbox"/> 1 Protect	<input type="checkbox"/> 2 Ensure	<input type="checkbox"/> 3 Enhance	<input checked="" type="checkbox"/> 4 Improve
Action Item:						
Improve knowledge of landslide hazard areas and understanding of vulnerability and risk to life and property in those areas.						
Possible Actions:						
a. Continue mapping county landslide and debris flow areas. b. Identify the location and extent of hazard areas and establish a factual base to support implementation of future measures. c. Analyze the risk of these areas to life, property, and infrastructure.						
Coordinating Organization:	City of Beaverton					
Internal Partners:			External Partners:			
Emergency Management, Community Development Department, ISD/GIS			Department of Geology and Mineral Industries (DOGAMI), Clean Water Services. Washington County			
Action Item Status:	<ul style="list-style-type: none"> • LIDAR Mapping showed one ancient landslide that is inside City limits. • A Hazard Map is posted on the City's website and it includes the slide areas identified by LIDAR. https://www.beavertonoregon.gov/DocumentCenter/View/874/Natural-Hazards-Map?bidId= 					

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Future Action Items

Future Action Items are items that will be addressed during a future NHMP cycle.

Future Action Items are listed by priority; from the highest to the lowest regardless of the hazard.

Natural Hazard Item	Priority Score	Timeline	Alignment with Plan Goals:			
Short-Term Earthquake #1	14	<input type="checkbox"/> On-going <input type="checkbox"/> Current Cycle <input checked="" type="checkbox"/> Future Cycle	<input checked="" type="checkbox"/> 1 Protect	<input checked="" type="checkbox"/> 2 Ensure	<input type="checkbox"/> 3 Enhance	<input checked="" type="checkbox"/> 4 Improve
Action Item:						
Identify funding sources for implementing earthquake mitigation in Beaverton.						
Possible Actions:						
a. Coordinate with Washington County to leverage funds for earthquake loss reduction program similar to the City of Seattle’s Project Impact model. b. Evaluate grant and foundations that support earthquake mitigation activities.						
Coordinating Organization:	City of Beaverton					
Internal Partners:			External Partners:			
Emergency Management, Community Development Department, Mayor’s Office,			Federal Emergency Management Agency (FEMA), Oregon Emergency Management (OEM), Partners for Loss Prevention, Washington County			
Action Item Status:						

Natural Hazard Item	Priority Score	Timeline	Alignment with Plan Goals:			
Long-Term Flood #6	9	<input type="checkbox"/> On-going <input type="checkbox"/> Current Cycle <input checked="" type="checkbox"/> Future Cycle	<input checked="" type="checkbox"/> 1 Protect	<input type="checkbox"/> 2 Ensure	<input type="checkbox"/> 3 Enhance	<input checked="" type="checkbox"/> 4 Improve
Action Item:						

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Create a regional partnership to reduce flood loss across the region.	
Possible Actions:	
<ul style="list-style-type: none"> a. Work flood issues on a regional basis to avoid moving flood problems to other jurisdictions. b. Create a regional process for naming un-named streams. c. Work with regional partners including the City, Clean Water Services and the State Floodplain Manager to improve floodplain data for the City that will support conducting future full risk analyses in Beaverton. 	
Coordinating Organization:	City of Beaverton
Internal Partners:	External Partners:
Community Development, Public Works	Clean Water Services, Natural Resources Conservation Service, Soil and Water Conservation District, Washington County, Other Cities
Action Item Status:	

Natural Hazard Item	Priority Score	Timeline	Alignment with Plan Goals:			
Long-Term Flood #5	8	<input type="checkbox"/> On-going <input type="checkbox"/> Current Cycle <input checked="" type="checkbox"/> Future Cycle	<input checked="" type="checkbox"/> 1 Protect	<input type="checkbox"/> 2 Ensure	<input type="checkbox"/> 3 Enhance	<input type="checkbox"/> 4 Improve
Action Item:						
Update City code to improve risk reduction and prevention of natural hazard impacts.						
Possible Actions:						

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<ul style="list-style-type: none"> a. Remove barriers in City codes and planning regulations that prevent best management practices in urban design. b. Protect critical and essential facilities against flood damage at the time of initial construction. c. Consider increasing regulations for all new fill, grading, and dredging in floodplain areas. d. Regulate to prevent construction of flood barriers which will unnaturally divert flood waters or increase flood hazards. e. Review and update City flood ordinance. Provide additional, more stringent standards designed to encourage sound floodplain management, reduce flood risks, and potentially allow property owners to obtain flood insurance at a lower premium rate. f. Write and implement new code requiring developers to install permeable surfaces to reduce storm water runoff volume and encourage aquifer recharging via increased storm water percolation. g. Consider adopting stricter elevation requirements for development within the floodplain. h. Develop codes and ordinances to require owners of private water quality and water detention facilities to maintain them so that they can perform their required function and engineered capacity. 	
Coordinating Organization:	City of Beaverton
Internal Partners:	External Partners:
Community Development, Public Works	Clean Water Services, Natural Resources Conservation Service, Soil and Water Conservation District, Washington County, Other Cities
Action Item Status:	

Natural Hazard Item	Priority Score	Timeline	Alignment with Plan Goals:			
Long-Term Volcano #2	7	<input type="checkbox"/> On-going <input type="checkbox"/> Current Cycle <input checked="" type="checkbox"/> Future Cycle	<input checked="" type="checkbox"/> 1 Protect	<input type="checkbox"/> 2 Ensure	<input type="checkbox"/> 3 Enhance	<input type="checkbox"/> 4 Improve
Action Item:						
Establish a plan for ash removal following a volcanic event.						
Possible Actions:						

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<ul style="list-style-type: none"> a. Educate residents on what they can do to assist in clean-up and debris removal efforts following a volcanic event. b. Assist the public in removing ash by developing a system for ash removal. c. Develop public and private partnerships to ensure proper clean-up. 	
Coordinating Organization:	City of Beaverton
Internal Partners:	External Partners:
Emergency Management, Public Works Department, Recycling/Sustainability	Washington County, Solid Waste Haulers
Action Item Status:	

Natural Hazard Item	Priority Score	Timeline	Alignment with Plan Goals:			
Long-Term Flood #2	7	<input type="checkbox"/> On-going <input type="checkbox"/> Current Cycle <input checked="" type="checkbox"/> Future Cycle	<input type="checkbox"/> 1 Protect	<input type="checkbox"/> 2 Ensure	<input type="checkbox"/> 3 Enhance	<input checked="" type="checkbox"/> 4 Improve
Action Item:						
Provide flood event education and outreach to households and businesses.						
Possible Actions:						
<ul style="list-style-type: none"> a. Identify and map vulnerable populations b. Create flood education and outreach aimed at specific populations (i.e. schools, households, businesses, etc.). c. Identify and provide mitigation guidance to owners of properties at risk from flooding. d. Recruit individuals to speak to households, and businesses/employees about flood issues. e. Develop a “Clean Stream” sponsorship program, using the “Friends of Fanno Creek” model. Erect signage recognizing individuals, households, businesses, and organizations committed to the ongoing care of a waterway section. f. Raise awareness level of property owners and developers that impacts upstream result in impacts downstream, and lack of storm water best management practices can result in an increase in flooding events. g. Educate private property owners on restoring natural systems within the floodplain to manage riparian areas and wetlands for flood abatement. h. Erect “monuments” over piped creeks throughout the City and floodplain elevation markers to bring flood awareness to home and business owners who live near them. i. Educate public on the need for them to maintain their private water quality and water detention facilities. 						

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Coordinating Organization:	City of Beaverton	
Internal Partners:	External Partners:	
Emergency Management, Public Works Department, Community Development Department	Clean Water Services, Tualatin River Watershed Council, Tualatin Riverkeepers, Insurance Information Service of Oregon and Idaho, Washington County, Department of Land Conservation and Development, Oregon Emergency Management	
Action Item Status:		