

EXECUTIVE SUMMARY

WHAT IS HAZARD MITIGATION?

Hazard mitigation is action that communities take before a disaster to reduce the potential for death, injury, and property damage. It is about acting to reduce potential impacts when such action is most effective: before a disaster strikes. *The Mitigation Action Plan* (MAP) identifies how natural hazard events like floods, landslides, and earthquakes might affect the City of Portland; it lists actions that City offices can take before a disaster to protect people, critical infrastructure, and natural resources, and ensure the continuation of services, livability, and economic stability for all Portlanders.

The MAP meets hazard mitigation planning requirements for funding eligibility under Federal Emergency Management Agency (FEMA) grant programs. It also meets the floodplain management planning requirements for FEMA's Community Rating System.

UPDATING THE CITY OF PORTLAND PLAN

The MAP is the second comprehensive update to the *City of Portland Natural Hazard Mitigation Plan* (NHMP), which was first developed in 2004. Since the development of the initial plan, the City has made significant progress in its mitigation programs and activities. A 5-year progress report conducted while developing the MAP determined that 75 percent of the 101 mitigation actions identified in the 2010 NHMP were initiated or completed during the plan's performance period. The MAP builds on those successes and enhances the 2010 NHMP in several ways:

- The public engagement strategy was significantly enhanced for development of the MAP, starting with a 32-member steering committee with broad representation from City bureaus, community groups, disability advocates, communities of color, subject-matter experts, and other stakeholders. The steering committee had 10 formal meetings and attended two equity trainings over the 18-month project.
- An equity lens was used throughout the planning process to ensure that the plan process and outcomes benefit people who are most likely to suffer from a natural hazard event.
- The vision, mission and goals were refined to reflect changes in community priorities and to enhance integration among community planning efforts. The vision is aligned with the City's Comprehensive Plan mission.
- The plan addresses eight main hazards of concern, an emerging hazard of concern, and several compounding factors relevant to adverse impacts from natural hazards.
- The risk and vulnerability assessments for all hazards of concern were updated using best available data and a more robust risk assessment platform.
- Significant revisions and enhancements were made to the action plan, including the identification of implementation parameters aimed at enhancing transparency and accountability.
- The updated strategy for implementing and maintaining the MAP includes a working group that will meet annually over the plan's performance period.

The MAP shows a commitment to regional collaboration and resilience by establishing a linkage procedure for special purpose districts in the City to formally link to the plan and establish their own eligibility for federal grant funds.

PLAN DEVELOPMENT APPROACH

Development of the MAP relied on broad participation from many stakeholders. The plan development strategy was designed to result in a plan that sets the stage for equitably reducing the adverse impacts of natural hazards in the City through actions embraced by both elected officials and the people of Portland. The process encompassed eight phases:

- Phase 1—Organize resources and review the prior plan
- Phase 2—Update the risk assessment
- Phase 3—Develop and implement a public engagement strategy
- Phase 4—Update goals, objectives and actions
- Phase 5—Review and update the plan maintenance strategy
- Phase 6—Assemble the updated plan
- Phase 7—Initiate and complete plan review and adoption
- Phase 8—Implement the approved, adopted plan.

Phases 2, 3, 4, 7 and 8 are described below; the MAP has information on all eight phases.

As the plan was developed, a simultaneous process assessed natural hazard risks for the City’s Critical Energy Infrastructure Hub along the Willamette River. Results of this study are incorporated into the plan document as appropriate.

Update the Risk Assessment

Risk assessment is the process of measuring the potential loss of life, personal injury, economic injury, and property damage resulting from natural hazards. The risk assessment was used to rank risk and to gauge the potential impacts of each hazard of concern on the City. Risks were assessed for nine geographic “reporting areas” to compare risk throughout the City. Based on the risk assessment, hazards of concern were ranked for the risk they pose to the overall planning area, as shown in Table ES-1. The ranking is based on the probability of occurrence of a hazard and likely impacts in three categories: impacts on people, impacts on property, and impacts on the local economy. The sections below describe key components of the risk assessment for the MAP.

Table ES-1. Hazard Risk Ranking

Hazard Ranking	Hazard ^a	Risk Rating
1	Severe weather	High
2	Earthquake	High
3	Landslide	Medium
3	Wildfire	Medium
4	Flood	Medium
5	Volcanic Activity	Low
6	Dam Failure	Low
7	Drought	Low

- a. Space weather was identified as an emerging hazard of concern but a full risk assessment was not conducted and, therefore, risk is not ranked. This will be revisited at the next plan update.

Hazard Identification and Profiling

Eight hazards of concern, and one emerging hazard of concern (space weather) were selected:

- Severe weather
- Earthquake
- Landslide
- Wildfire
- Flood
- Volcano
- Dam failure
- Drought.

Assessment of the Impact of Hazards on Physical, Social and Economic Assets

The following are key findings for the five highest ranked hazards (see Table ES-1):

- **Severe Weather**—Since 1950, Portland has experienced at least 150 severe weather events, including high winds, heavy snow and rain, and excessive heat. Climate change and El Niño weather patterns could change the severity and frequency of severe weather events. Older buildings and utilities like power lines are more susceptible to damage from severe weather. People who depend on electricity for life support or people without homes are likely to suffer most from severe weather events.
- **Earthquake**—The Portland area has experienced numerous earthquakes in the past, ranging from Magnitude 4.5 to 9.0. Portland is certain to experience seismic events in the future. Many of Portland’s buildings were built before seismic design requirements were included in building codes, or before modern codes were adopted. Over 13,000 of Portland’s buildings are in areas with high liquefaction susceptibility, and during a Cascadia Subduction Zone earthquake, nearly 6,000 people in Portland may be displaced from their homes.
- **Landslide**—Hundreds of landslides have occurred in Portland in the past 20 years, and the City can expect many more in the future. Landslides are most likely on steep slopes when the ground is saturated from rainfall or poor drainage. More than 89,000 people in Portland live in landslide hazard areas, along with over \$20 billion worth of buildings and contents.
- **Wildfire**—Portland is a wildland-urban interface community, meaning that its structures are near or within natural areas than are prone to wildfire. Wildfire season is usually from June through October, although climate change, increasing fuel load (including from invasive species), and drought conditions may cause this to vary. In Portland, over 68,000 people are estimated to live in wildfire hazard areas, and over 19,000 buildings. Over 96 percent of these buildings are residential.
- **Flood**—Portland is at the confluence of two major rivers, and has many smaller creeks and streams that flow within the city limits. The city is susceptible to flooding from the rivers and streams, as well as urban flooding from overwhelmed or blocked storm drains and runoff from impervious surfaces. There are 2,925 structures in the 1-percent-annual-chance flood hazard area, and over 9,500 people who live in these areas. Only about half of the people who live in the 1-percent-annual-chance flood hazard area have flood insurance. FEMA flood maps do not take into account the residual risk for properties protected by a flood-control levee, so there may be a misperception that the flood risk in these areas is zero.

Vulnerability Identification

Vulnerability identification includes an assessment of social vulnerability using demographic indicators. Vulnerability to natural hazards is affected by a person’s social and economic circumstances in everyday life. People who lack access to resources and information are likely to suffer most in a disaster. The key vulnerability factors for this plan include: people under 15, people over 65, renter-occupied housing, people of color, people with disabilities, and limited English-speaking households.

Estimates of the Cost of Potential Damage

Some of the most costly scenarios include the following:

- A 0.2-percent-annual-chance flood (commonly referred to as a 500-year flood) could cause over \$19 billion in damage to structures and their contents.
- The Portland Hills Magnitude-6.5 Earthquake Scenario could cause \$24 billion in damage.

Develop and Implement a Public Engagement Strategy

The public engagement strategy was developed through discussion with the steering committee, review of best practices, interviews with community members, and input from experts contracted to assist with development of the equity lens. The implemented strategy promotes effective cooperation between City government and community organizations. It encouraged public participation during the MAP development process and will facilitate continued engagement with residents after adoption of the MAP. The following were key features of the strategy:

- An online platform for information sharing with the MAP steering committee and the public
- Stakeholder involvement through more than 50 in-person meetings or presentations and countless phone calls and emails
- A public survey that received almost 3,000 responses
- Nine community workshops, attended by more than 175 participants, to learn about the public's perception of risk and to identify existing efforts, possible partnerships, and recommended actions
- Five town hall events to answer questions and receive feedback on the draft plan during the 45-day public comment period.

Feedback received from the public engagement strategy was used throughout the plan process, especially in action item identification and selection.

Update Goals, Objectives and Actions

Vision, Mission, Goals, and Objectives

The steering committee reviewed and updated the vision, mission and goals from the 2010 NHMP and developed a set of objectives, as shown in Table ES-2. Goals were selected to support the vision and mission. Objectives were selected that meet multiple goals. Actions were selected and prioritized in part based the number of objectives each would help to accomplish.

Recommended Actions

The MAP's action plan presents 160 mitigation actions to reduce losses from natural hazards. City of Portland bureaus selected these actions from a variety of sources, including a mitigation best practices catalog supplemented with steering committee and other stakeholder recommendations, the results of the risk assessment and identified issues, public input, other plans and programs, the results of the capability assessment, and actions identified in the 2010 NHMP.

Table ES-2. Vision, Mission, Goals, and Objectives**Vision** *Our desired future state.*

Portland is a prosperous, healthy, equitable and resilient city where everyone has access to opportunity and is engaged in shaping decisions that affect their lives

Mission *What we do, who we do it for, and how.*

To equitably reduce risk and the adverse impacts of natural hazards by building community resilience through collaborative, cost-effective actions and strategies.

Goals *General guidelines that explain what we want to achieve with the plan.*

1. Protect life and reduce injuries.
2. Engage and build capacity for the whole community.
3. Minimize public and private property damage.
4. Protect, restore, and sustain natural systems.
5. Minimize the disruption of essential infrastructure and services.
6. Integrate mitigation strategies into existing plans and programs.
7. Prioritize multi-objective actions that reduce risk to vulnerable communities.

Objectives *Broader than actions, but more specific than goals, objectives are specific enough to help determine whether a proposed project or program would advance the values expressed in the mission and vision. Objectives may also be thought of as 'policies.' In the planning process, objectives are used to define and prioritize actions.*

- Strengthen development codes and update land use designations to facilitate effective disaster risk reduction
- Prevent or reduce mitigation-related disparities affecting under-served and under-represented communities through plans, investments and engagement
- Promote the use of natural systems to limit natural hazard related impacts
- Increase the resilience of high-risk and critical infrastructure through monitoring, planning, maintenance, investment, adaptive technology, and continuity planning
- Coordinate land use plans and public facility investments between City bureaus, other public and jurisdictional agencies, businesses, community partners, and other emergency response providers
- Support community outreach activities that increase stakeholder awareness and understanding of hazard risk, mitigation options, and preparedness strategies
- Identify and seek various funding opportunities for mitigation activities and look for ways to leverage existing funds
- Seek opportunities in which hazard mitigation also benefits other community goals
- Collect data to track progress on meeting mitigation goals.
- Use the best available data, science and technologies to improve understanding of the location and potential impacts of natural hazards, the vulnerability of building types and community development patterns, and the measures needed to protect life safety.
- Retrofit, purchase, or relocate structures in high hazard areas, especially those known to be repetitively damaged.
- Promote, incentivize and support the mitigation of private property.
- Improve systems that provide warning and emergency communications.
- Promote mutual information exchange and incorporate existing community networks in the identification and implementation of mitigation actions.
- Build City staff and community capacity to ensure effective implementation and equitable outcomes of mitigation action efforts
- Develop plans to reduce immediate impacts of natural hazard events, and to facilitate rapid and effective social and economic recovery.

Action Evaluation and Prioritization

Several steps were carried out to evaluate each action recommended in the MAP:

- An equity analysis screening was performed.
- Implementation information was identified, such as lead agency and timeline.
- A qualitative benefit/cost review was conducted.

Based on these analyses, multiple priority rankings were assigned to each action:

- Each action was rated high, medium or low for implementation, based on the benefit/cost ratio and funding availability
- Each action was rated high, medium or low for grant pursuit, based on grant eligibility and expected benefits
- Actions were assigned an “E” rating if the target audience/beneficiary identified for the action is one of the groups of focus for the assessment

Actions identified as high or medium implementation priority and supporting equity initiatives are identified in Table ES-3.

Table ES-3. High and Medium-Priority Actions from the Mitigation Action Plan Matrix

Action Number and Description	Implementation Priority
PBEM-10—Work with Office of Neighborhood Involvement Disability Program Coordinator to promote participation in the Additional Needs Registry through the Public Alerts system.	High-E
PBEM-12—Audit PBEM’s suite of plans to evaluate whether plans meet the needs of people with disabilities, people with language barriers, and other access and functional needs populations. Develop a transition plan to update all plans.	High-E
PBEM-23—Develop an emergency communications plan to distribute emergency messages to immigrant and refugee communities in language-appropriate and culturally appropriate ways.	High-E
BPS-1—Promote and fund energy independence projects in low-income neighborhoods and communities.	High-E
BPS-2—Plan for solar + battery storage systems, which can serve as mini power-supply stations or provide residents the ability to shelter in place after any electricity supply-disrupting event, at varying scales (project, neighborhood and district) and locations (critical City facilities, low-income housing, community gathering spots).	High-E
BPS-3—Encourage solar + battery storage demonstration projects at critical City facilities, in low-income neighborhoods and in other strategic locations.	High-E
BPS-7—Support 2015 Climate Action Plan and Climate Change Preparedness Strategy actions that relate to adaptation planning and natural hazard mitigation actions.	High-E
BPS-10—Develop an emergency service plan for solid waste removal in multifamily properties after a disaster event.	High-E
OEHR-1 — Prior to and during implementation, review all actions for negative externalities and to ensure vulnerable populations are protected from displacement or other disproportionate burdens.	High-E

Note: PBEM = Portland Bureau of Emergency Management; BPS = Bureau of Planning and Sustainability; OEHR = Office of Equity and Human Rights

Initiate and Complete Plan Review and Adoption

The MAP was submitted to Oregon’s Office of Emergency Management, FEMA Region X, and the Community Rating System contractor (Insurance Services Office, Inc.) for review and approval. The MAP will be presented to and adopted by the City of Portland City Council.

Implement the Approved, Adopted Plan

Plan implementation will occur over the next five years as the lead agencies begin to implement the actions identified in this plan. The Implementation and maintenance strategy developed by the steering committee will guide this phase. This phase will be dependent on the commitment of all City bureaus, elected officials and Portlanders to reducing risk from natural hazards.