

Section 5 Mitigation Strategy



5.1 NATURAL HAZARD MITIGATION VISION AND MISSION

DMA 2000 Requirements: Mitigation Strategy - Identification and Analysis of Mitigation Actions

Requirement §201.6(c)(3)(ii): [The mitigation strategy shall include a] section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard, with particular emphasis on new and existing buildings and infrastructure.

DMA 2000 Requirements: Mitigation Strategy - Identification and Analysis of Mitigation Actions: National Flood Insurance Program (NFIP) Compliance

Requirement §201.6(c)(3)(ii): [The mitigation strategy] must also address the jurisdiction's participation in the National Flood Insurance Program (NFIP) and continued compliance with NFIP requirements, as appropriate.

Vision

The 2010 City of Portland NHMP is the same as the 2004 NHMP vision to strive to create a "Disaster Resilient City:"

By creating a legacy of mitigation activities, City and community leaders' proactive implementation of long term, cost effective mitigation measures has protected its population, its properties, its natural and built environment and its investments. The forethought of Portland's leaders has preserved the City through decades of hazard events. (Portland 2004)

Mission Statement

The mission of the 2010 Natural Hazards Mitigation Plan is:

To reduce risk, prevent loss of property and commerce and promote expedient recovery, while safeguarding people and the environment from natural disaster events through a coordinated and collaborative community partnership.

5.2 DEVELOPING MITIGATION GOALS

DMA 2000 Requirements: Mitigation Strategy – Local Hazard Mitigation Goals

Requirement §201.6(c)(3)(i): [The hazard mitigation strategy shall include a] description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards.

Mitigation goals are defined as general guidelines that describe what a community wants to achieve in terms of hazard and loss prevention. Goal statements are typically long-range, policy-oriented statements representing community-wide visions.

For the 2004 NHMP, the Planning Team used the exposure analysis results as a basis for developing the mitigation goals and actions. The City selected the five goals in 2004 to reduce or avoid long-term vulnerabilities to the identified hazards for the five-year planning period.

- Identify risk level and evaluate Portland’s vulnerability to natural hazards
- Implement activities to protect human life, property and natural systems
- Promote public awareness, engage public participation and enhance partnerships through education, outreach and coordination of a diverse and representative group of the City’s population
- Establish a disaster resilient economy
- Build and support the capacity and commitment to continuously become less vulnerable to hazards

For this NHMP update, the Planning Team evaluated the 2004 NHMP’s goals and determined they needed to modify them to better meet the city changing needs. The City determined the seven goals to more clearly focus their long-term efforts to reducing risk and vulnerabilities to the identified hazards.

- Update the Risk Assessment and Vulnerability Analysis every five years
- Implement actions to prepare, protect, preserve and restore life, property and natural systems
- Promote public outreach to a variety of City populations
- Improve City of Portland’s economic resilience through inclusion of the private sector into mitigation action implementation
- Commit to continuously reducing the City’s natural hazards vulnerability
- Maximize mitigation effectiveness by taking a comprehensive approach to natural resource management via city plans, codes and programs that increase mitigation efforts
- Coordinate mitigation activities with regional communities and agencies

5.3 THE CITY'S MITIGATION SUCCESSES

City bureaus have realized that their mission specific programs include mitigation actions. Mitigation fits the Portland goals of becoming sustainable and livable. The understanding of mitigation as a part of planning supports FEMA's intent for developing local jurisdictional mitigation plans as stated in the September 2009 HMA Guidance, "FEMA HMA programs present a critical opportunity to reduce the risk to individuals and property from natural hazards while simultaneously reducing reliance on Federal disaster funds (FEMA 2008)."

Mitigation successes during the 2004-2009 NHMP planning cycle prevent damages and losses from disaster events. They also implement actions of the Wildland Urban Interface Fuel Reduction project, the Watershed Management Plan and upgrade of public safety services. Successes are benchmarks toward the goal of building a more resilient city. The list of successes include those actions that have been completed and also those that are still ongoing but have completed the action listed in the Portland 2004 NHMP.

Table 5-3a NHMP Mitigation Successes

Agency	Mitigation Action	Performance Description (Damages Prevented)
Bureau of Environmental Services (BES)	LTMH#4	Develop Citywide vegetation and protection strategy to protect wildfire, flood and landslide hazards
BES	STLS#2	Improve property owner awareness of property maintenance of private drainage systems
BES	LTLS#5	Update BES Sewer Systems and Drainage Facilities Design Manual
Government Relations	STEQ#5	Lobby to implement Obligation Bonds to fund rehabilitation of critical infrastructure and schools.
City Forester, Parks	STSW#3	Manage planting and maintenance of trees in the public right of way to minimize risk due to fire and landslide
BES	LTEQ#9	Assess stability of levees
PBOT	STMH#2	Form a committee to identify and coordinate critical transportation (street and highway) networks to enable emergency response prioritized route clearance and alternate routing during congestion or road blockages
POEM/Water	LTMH#11	Support development of a multiple-agency plan for Marine Drive closure coordination
BPS	LTLS#2	Acquire, demolish or relocate structures from hazard prone areas
POEM	LTMH#10	Assess the stability of levees in the Columbia Corridor Area and develop appropriate emergency plans
BES	LTEQ#2	Conduct a vulnerability analysis of Portland's sewer system to identify potential for collapse
BDS	STFL#2	Continue to co-fund improvements to river and stream gauges in the Portland metro area with USGS
BES	STFL#5	Acquire outside funding to hire a consultant to lead the application process for a continued Class 5 rating for CRS

Table 5-3a NHMP Mitigation Successes

Agency	Mitigation Action	Performance Description (Damages Prevented)
BES	STFL#9	Secure funding to implement the passive flood management projects
BDS	STFL#10	Improve definitions and refine standards for storm water retention
BES/Parks/BPS	LTFL#1	Increase funding for the Johnson Creek Willing Sellers Program
BDS/BES/PBOT	ST-LS#1	Continue to maintain and improve internal city communications to facilitate coordination
BES/PBOT	STLS#4	Initiate more operations and maintenance pilot projects along roads that inform about development
BDS	LTLS#1	Develop a comprehensive landslide map for the City to identify historic hazard areas
BES, BPS	LTLS#3	Evaluate the role of drainage systems in the West Hills
BES	LTLS#6	Employ alternative construction methods to reduce the impact of development on landslide prone areas
Fire/Parks	LTWF#4	Complete an assessment to characterize high priority wildfire risk areas and recommend strategies



Blackberries fuel preemptive burn to mitigate wildland urban interface fire

5.4 IMPLEMENTED STAFFORD ACT 406 MITIGATION ACTIONS

The 2010 Natural Hazard Mitigation Plan focuses on pre-disaster mitigation projects. Pre DMA 2000, mitigation plans were primarily created post disaster with the intention of preventing greater loss. The City of Portland did this after the floods of 1996. After the winter storms of 2008 Oregon Emergency Management (OEM) surveyed Public Assistance (PA) Program project worksheets (PWs) for funded Stafford Act §406 hazard mitigation projects (projects) to determine the efficacy of their PA-enhanced Stafford Act §406 mitigation program, which supplements damage repairs to reduce future damages.



Successful mitigation strategy:
purchase of tire chains for transit buses

OEM examined relevant project information from the two federally declared disasters that occurred during the last planning cycle, DR-1824 (Severe Winter Storm of December 13-26, 2008) and DR-1510 (Severe Winter Storm of December 26, 2003 through January 14, 2004).

OEM identified 13 sites where Section 406 funds enabled additional mitigation beyond damage repair. Mitigations performed successfully at 12 of the 13 sites from 2004 through the latest severe winter storm (DR-1824). The remaining site (City of Portland PW 277) received two different mitigation actions. One of these succeeded the other did not. There were five successful mitigations types:

- Electrical; monitored alarms, surge/phase protection, transfer switch – five projects
- Roof attachments; snow guards, gutter attachments – three projects
- Roof structural; truss upgrades – two projects
- Plumbing; insulation, heat tapes – two projects
- Tire chains; upgrade – one project

The unsuccessful mitigation activity involved installing snow guards above the ductwork to prevent roof snow and ice slide damage. The snow guards proved insufficient to handle the snow loads at the site due to above average snow loads. Heavy snow loads damaged the ductwork several times over a three to four year period. In 2008, the applicant installed a very heavy-duty metal framework around the ductwork. This proved successful during the 2008 severe winter storm (DR-1824 event).

The City received Stafford Act §406 funding for four of the listed damage sites. Table 5-4a lists the City's §406 Mitigation success stories by Disaster number.

Table 5-4a City of Portland's \$406 Mitigation Success Stories by Disaster Number

Applicant	Damage Narrative	PW Project Repair Cost	Mitigation Action	406 Mitigation Implementation Cost	Success Story by Disaster Number
City of Portland DR-1510 PW#277	Heavy snow and ice slid off roof and damaged HVAC unit and ductwork	\$8,515.00	Mitigation raised HVAC unit and placed snow/ice shields on roof	\$2,305.00	Applicant reports that mitigation worked well through latest storm (DR-1824) for HVAC unit in latest storm, DR-1824.
	Heavy snow and ice slid off roof and damaged ductwork		Mitigation Placed snow/ice shields on roof		Applicant reports that mitigation did not work for ductwork. Ductwork damaged in 2005 (1510) and again in 2007-2008. Applicant attempted mitigation in 2005 (unsuccessful) and again in 2008 which successfully protected ductwork in latest storm, DR-1824.
City of Portland East Portland CC DR-1510 PW#280	Power outage resulted in frozen/burst pipes in boiler room	\$3,350.46	Mitigation added a monitored temperature sensor to boiler room	\$318.00	Applicant reports that mitigation worked well through latest storm, DR-1824.
City of Portland Pittock Tea House DR-1510 PW#283	Freezing temperatures caused pipes and radiators to burst	\$35,846.28	Mitigation added a monitored temperature alarm in furnace room	\$277.50	Applicant reports that mitigation worked well through latest storm, DR-1824.
TRIMET DR-1510 PW#116	Heavy snow and ice conditions resulted in broken bus tire chains and damage to vehicles	\$137,000.00	Mitigation replaced broken chains with stronger chains constructed using nickel/ manganese steel alloy with a case hardened core	\$18,840.00	Applicant reports that mitigation worked well through latest storm, DR-1824.

The eligible PA infrastructure damages were \$289,000. Total mitigation cost of the 13 projects was approximately \$74,000. This equates to applying approximately 25 percent to the total eligible project costs creating a vast savings over subsequent disaster events.

The following photos depict the temperature sensors added as 406 mitigation initiatives to supplement hazard-generated, PA-funded repairs.

Figure 5-4a Boiler Room Temperature Sensor at East Portland Community Center



East Portland CC
Temperature Alarm
PW 280



Figure 5-4b Furnace Room Temperature Sensor at Portland Parks Bureau Pittock Mansion Tea House



Pittock Tea House
Temperature Alarm
PW 283



The Pittock Mansion is a French Renaissance chateau in the West Hills of Portland, Oregon originally built as a private home for *The Oregonian* publisher Henry Pittock and his wife, Georgiana. It is a 22 room estate built of Tenino Sandstone situated on 46 acres that is now owned by the city's Bureau of Parks and Recreation.

5.5 EVALUATING AND PRIORITIZING MITIGATION ACTIONS

DMA 2000 Requirements: Mitigation Strategy - Implementation of Mitigation Actions

Requirement: §201.6(c)(3)(iii): [The mitigation strategy section shall include] an action plan describing how the actions identified in section (c)(3)(ii) will be prioritized, implemented and administered by the local jurisdiction. Prioritization 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 Mitigation Action Plan represents mitigation projects and programs the City will implement through the cooperation of multiple entities. The Planning Team was tasked with reviewing previous NHMP mitigation actions to determine their current status and potential cost benefit ratio. Four POEM interns from Portland State University conducted research, gathered data and provided summary statements as to streamline the process. POEM facilitated a Planning Team Meeting to determine any existing data gaps, solicited subject-matter experts' assistance to close those gaps and consolidated the resultant information.

The Planning Team reviewed the simplified STAPLEE evaluation criteria and decided not to use the STAPLEE method due to time constraints and process complexity. The Team determined they comprised the expertise and historical knowledge to select and prioritize the City's mitigation activities. The Planning Team reviewed the existing goals and proceeded to edit them to better reflect the City's growing needs.

On November 6, 2009, the Planning Team prioritized each of the 114 selected mitigation actions for implementation. Table 5-6-1a contains those actions brought forward for implementation during the new five-year planning cycle. The selected mitigation actions each contain a qualitative benefits/costs and technical

feasibility narrative statement. It is understood that the list of actions is for planning and record keeping purposes. A detailed benefit/cost analysis is required as part of the application process for those projects the City chooses to implement.



Mitigation project to stabilize Portland's water system, 2008

5.6 MITIGATION ACTION PLAN IMPLEMENTATION

The mitigation action plan identifies short and long-term action items developed through data collection and research. Mitigation plan activities may be considered for funding through State and Federal grant programs, including FEMA's Hazard Mitigation Grant Program, Pre-Disaster Mitigation Grant Program and Flood Mitigation Assistance (FMA).

5.6.1 Mitigation Plan Action Items

Action items address Multi-Hazard(MH), hazard specific issues and floodplain actions to ensure continued NFIP compliance for the hazards addressed in this plan. To facilitate implementation, each action item includes information on timeline, coordinating and partner organizations and NHMP goals.

Priority

The Planning Team then reviewed the comprehensive list of existing mitigation actions' status to determine if they meet the newly revised goals. They then cooperatively reviewed the Benefit-Cost Analysis Fact Sheet (Appendix E) to consider the opportunities and constraints of implementing selected mitigation actions.

The Team used this as a starting point to prioritize those actions under their purview as they pertain to each bureau's ability to accomplish those actions; and then used the following process to prioritize their mitigation actions:

- Analyzed each action item by hazard to determine how many of the goals applied to each action item.
- Analyzed the number of hazards that each action item addressed.
- Each bureau charged with implementation responsibility then determined those action items' priority. They then considered whether the action item was on their existing work plan, have available or identified funding and determined whether it is ready to implement.
- Each hazard's history, extent and recurrence probability was analyzed and each mitigation action ranked in descending order with the action item demonstrating the highest mitigation potential at the top of the list with the remaining action items followed in descending order: Each action item was assigned a priority ranking of high, medium, or low:
- *High* priorities are associated with actions for hazards that impact the community on an annual or near annual basis and generate impacts to critical facilities and/or people.
- *Medium* priorities are associated with actions for hazards that impact the community less frequently and do not typically generate impacts to critical facilities and/or people.
- *Low* priorities are associated with actions for hazards that rarely impact the community and have rarely generated documented impacts to critical facilities and/or people.

Coordinating Organization

The coordinating organization is the public agency with regulatory responsibility to address natural hazards, or that is willing and able to organize resources, find appropriate funding, or oversee activity implementation, monitoring and evaluation. The coordinating organization for all action items for the NHMP is the City and more specifically a bureau from the City.

Internal Partners

Internal partner organizations are bureaus within the City that may be able to assist in the implementation of action items by providing relevant resources to the coordinating organization.

External Partners

External partner organizations can assist the City in implementing the action items in various functions and may include local, regional, State, or Federal agencies, as well as local and regional public and private sector organizations. Reference to any partner, either internal or external does not mandate their inclusion in the implementation process but is to be used as a suggestion of agencies that may participate.

Timeline

Action items include both short- and long-term activities. Each action item includes an estimate of the timeline for implementation.

Short-term action items are activities that City departments may implement with existing resources and authorities within one to two years.

Long-term action items may require new or additional resources and/or authorities and may take between one and five years (or longer) to implement.

Plan Goals Addressed

The NHMP goals addressed by each action item are identified as a means for monitoring and evaluating how well the mitigation plan is achieving its goals following implementation.

Appendix C (Table C-4a) contains the matrix that was a part of the planning process. It lists all of the action items from 2004, deleted, deferred, ongoing and completed actions.

Potential Funding Sources

The following is a list of the potential funding sources identified in Table 5-6-1a:

- FEMA HMA
- FEMA Assistance to Firefighters Grant (AFG) Programs
- Fire Prevention and Safety Grant (FP&S) Program
- Staffing for Adequate Fire and Emergency Response (SAFER) Program
- Emergency Food and Shelter Program (EFSP)
- Lindbergh Grant Program (LGP)
- National Resource Conservation Service (NRCS)
- Public Private Partnerships

Benefit/Cost and Technical Feasibility

Table 5-6-1a contains a short narrative statement regarding each project's Benefit versus Cost (B/C) analysis. The table also contains a short narrative statement about each project's technical feasibility (TF). The City will perform detailed benefit/cost analysis as a part of grant application preparation phase to fulfill FEMA grant criteria and requirements. FEMA's BCA website states: (<http://www.fema.gov/government/grant/bca.shtm>)

"Applicants and Sub-Applicants must use FEMA-approved methodologies and software to demonstrate the cost-effectiveness of their projects. This will ensure that the calculations and methods are standardized, facilitating the project evaluation process.

FEMA has developed a suite of Benefit-Cost Analysis (BCA) software for a range of major natural hazards: earthquake, fire (wildland/urban interface fires), flood (riverine, coastal A-Zone, Coastal V-Zone), Hurricane Wind (and Typhoon) and Tornado. Sometimes, however, there is not enough technical data available to use the BCA software.

When this happens, or for other common, smaller-scale hazards or more localized hazards, BCAs can be done with the Frequency Damage Method (i.e., the Riverine Limited Data module), which is applicable to any natural hazard as long as a relationship can be established between how often natural hazard events occur and how much damage and losses occur as a result of the event. This approach can be used for windstorms, freezing, mud/landslides, severe ice storms snow and volcano hazards.

Alternative BCA software may also be used, but only if the FEMA Regional Office and FEMA Headquarters approve the software."

A prioritized list of action items, their potential funding source and technical feasibility has been collected in the following table. Columns identify the actions according to Action ID number, Description (which includes a theme for coordinated planning purposes – education & outreach, planning, NFIP, mapping and asset management) the responsible department and the potential

funding/feasibility. Action items will be analyzed for cross bureau collaboration and their applicability to multiple agency plans. Prioritization is to identify which actions address multiple hazards, goals and feasibility because they will have a higher potential for implementation.



Smoke on the water exercise collaboration, 2010

Table 5-6-1a Benefit Vs. Cost Analysis

ACTION ID	GOALS	DESCRIPTION	PRIORITIZATION (HIGH, MEDIUM, LOW)	RESPONSIBLE & COORDINATING BUREAUS & AGENCIES	POTENTIAL FUNDING AGENCIES	TIMEFRAME	(B/C) BENEFIT-COSTS (TF) TECHNICAL FEASIBILITY
ST MH #1	1-7	Continue to involve the public in updating the Natural Hazard Mitigation Plan. (education & outreach)	High	POEM, BPS, ONI	City of Portland	ST Ongoing	B/C: Continued public involvement is critical to activity success and builds initiative support. TF: This is a non-technical activity involving effective communication, staff resources and outreach; this activity is feasible for the City to complete.
ST MH #2	2,3,4,6,7	Form a committee to identify and coordinate critical transportation (street and highway) networks. (mapping, asset management)	Medium	PBOT, POEM,BPS	City of Portland	ST Ongoing	B/C: Agreements of identified infrastructure to be strengthened to withstand area hazards and post disaster procedures that can immediately be implemented to expedite service delivery reduces costs of disaster. TF: This is feasible using existing resources as the City has awareness of existing and future transportation requirements.
ST MH #3	2-7	Coordinate emergency standard operating procedures and plans between disaster responder organizations in the Portland metro region, to coordinate and expedite decision-making during emergencies. (planning)	High	POEM, PBOT, BF&R, BOEC	City of Portland, DHS	LT Ongoing	B/C: Coordinated multi-bureau planning and the understood system interdependencies ensure prioritized restoration of systems and coordinated response to affect the greatest number of people in the least amount of time therefore reducing the loss of life, property and affect on the economy. TF: This is feasible to accomplish as no cost is associated with the action and planning is already active between multiple bureaus and agencies.
ST MH #4	2,3,6,7	Develop a multiple-agency multi-hazard evacuation plan (EQ, flood, fire and landslide at a minimum).	High	POEM, PBOT	City of Portland, FEMA AFG, FP&S, SAFER, EFSP, DHS	LT Ongoing	B/C: Pre-established plans for transportation system vulnerabilities, alternate routing in potential hazard areas and the responsible agencies to implement routing of populations away from hazards increases the number of lives taken out of harms way and decreases injury and loss of life. TF: This activity involves effective communication and staff resources, is feasible for the City to complete because planning is currently being implemented.
ST MH #5	1-7	Acquire Light Detection and Ranging (LiDAR) images of the Portland Metro area to facilitate natural hazard area risk assessment and vulnerability analysis. (mapping) (NFIP Compliance)	High	POEM, CGIS, BES, BF&R, Water, PBOT	City of Portland, FEMA HMA, FEMA AFG, FP&S, SAFER, DHS	ST Ongoing	B/C: Pre-identification of hazard areas ensures that structures are not placed within hazard areas. Developing a mapping committee ensures a comprehensive approach to determining the City's mapping needs. TF: This is feasible as financial resources become available. LiDAR will greatly enhance the City's risk and vulnerability analysis through expanded mapping capability.
ST MH #6	1,4,7	Use findings from Portland's Risk Assessment (HAZUS-MH) to enhance existing debris removal plan. HAZUS-MH will need to be updated. (existing GIS Mapping)	Low	BPS, POEM, PBOT, BES	City of Portland, FEMA HMA	ST Ongoing	B/C: Pre-identification of appropriate land for potential the different types of waste will expedite recovery and decrease the potential of public health issues related to debris. TF: This is feasible as financial resources become available. HAZUS MH data will greatly enhance the City's debris management analysis through expanded mapping capability.
ST MH #7	1,2,6	Create a mitigation mapping committee to index and maintain GIS mapped inventory and develop prioritized list of critical facilities, residential and commercial buildings within known hazard areas such as earthquake, erosion, the 100-year and 500-year floodplains, invasive plant species, landslide and wildfire areas. (NFIP Compliance) Identify parameters and methods for new maps as needed to meet multi-hazard mitigation goals and to improve communication with the public.	High	POEM, CGIS, BES, PBOT, BDS. BF&R, Water, BPS	City of Portland	ST Ongoing	B/C: Coordinated mapping ensures effective damage avoidance or reduction and ensures proper attention is assigned to reduce losses and damage to structures and City residents. It also ensures bureau coordination which expedites understanding as it applies to asset management as related to hazards. TF: This is feasible using existing resources. The City's possesses GIS infrastructure to easily accomplish these tasks.

Table 5-6-1a Benefit Vs. Cost Analysis

ACTION ID	GOALS	DESCRIPTION	PRIORITIZATION (HIGH, MEDIUM, LOW)	RESPONSIBLE & COORDINATING BUREAUS & AGENCIES	POTENTIAL FUNDING AGENCIES	TIMEFRAME	(B/C) BENEFIT-COSTS (TF) TECHNICAL FEASIBILITY
ST MH #8	3,4,5,6,7	Partner with utilities as they ensure continuity of service to the City and the Columbia South Shore Well field to provide for redundancy in case of primary power outage. (asset management)	High	Water, BES	City of Portland, Utility Companies	ST Ongoing	B/C: Redundant capability is essential for sustainability and operations continuity. TF: This activity is technically feasible within the community through partnership agreements or memoranda to maximize existing utility infrastructure availability.
ST MH #9	3,5,6	Develop a city employee emergency response plan to assure that city employees know what is expected of them to continue City operations. (education, outreach)	High	POEM, HR, OMF, BGS, BF&R, Police, BOEC	City of Portland, DHS	ST Ongoing	B/C: City employees who are trained can aid the public in disaster if they are at home or at work multiplying the ability for the community to be self reliant and therefore reducing potential injury and loss of life. Employees trained to respond in a coordinated manner continues the operation of the city so that there is less impact on the public and the economy. TF: This activity involves effective communication and staff resources; this activity is currently in practice and is feasible for the City to complete.
ST MH #10	2,3,5,6	Develop educational materials (television and print media) for residents that identify and define their risk to multi hazards: define and offer mitigation measures that residents can take home or share, determine method of distribution of the educational materials and coordinate with the media to reduce conveyance of misinformation. (education, outreach)	High	POEM	City of Portland FEMA HMA, FEMA AFG, FP&S, SAFER, EFSP, DHS, NRCS	ST Ongoing	B/C: Sustained mitigation outreach program has minimal cost and will help build and support area-wide capacity. This type activity enables the public to prepare for, respond to and recover from disasters. TF: This low cost activity can be combined with recurring outreach opportunities at meetings where hazard specific information can be presented in small increments. This activity is ongoing demonstrating its feasibility.
ST MH #11	2,5,6,7	Implement actions in the 2005 Portland watershed management Plan (PWMP) (planning) (NFIP Compliance)	High	BES	City of Portland	ST Ongoing	B/C: Coordinated planning ensures effective damage abatement and ensures proper attention is assigned to reduce losses and damage to structures and City residents. Watershed management reduces flooding, landslides, the impact of severe weather and erosion. TF: This activity involves effective communication and staff resources; this activity is feasible for the City to complete. This activity is ongoing demonstrating its feasibility.
LT MH #1	2,5,6,7	Revise Portland's Comprehensive Plan to address and implement Citywide policies, land use improvements and mapping changes to natural hazards including, but not limited to, earthquakes, erosion, floods, invasive plants, landslides, volcano, severe weather and wildfires. (mapping, planning) (NFIP Compliance)		BPS	City of Portland	LT Ongoing	B/C: Land use planning that considers hazards as an integral component, policies can be established that will ensure reduction of loss and damage to structures. TF: This activity is feasible and currently being implemented through the background reports of the Portland Plan which will inform the 25 year long range Comprehensive Plan.
LT MH #3	2,4,7	Increase the responsiveness of the emergency permitting procedures for post-hazard event periods through development of a procedural plan and the purchase of a mobile permitting van. (planning)	Medium	BDS,BOT, BES, Water, Risk Management	City of Portland	LT Ongoing	B/C: Rapid emergency permitting processes enables expedited project commencement and service continuity. TF: This project is feasible using existing staff by streamlining the permitting process while ensure essential criteria are fulfilled.

Table 5-6-1a Benefit Vs. Cost Analysis

ACTION ID	GOALS	DESCRIPTION	PRIORITIZATION (HIGH, MEDIUM, LOW)	RESPONSIBLE & COORDINATING BUREAUS & AGENCIES	POTENTIAL FUNDING AGENCIES	TIMEFRAME	(B/C) BENEFIT-COSTS (TF) TECHNICAL FEASIBILITY
LT MH #6	3,4,7	Promote the development of TriMet communications and dispatch capability to immediately implement changes to transit routes and service due to disruption of streets, roads, bridges, rail transit tracks and the information technology that provides connectivity. (planning)	Medium	PBOT, BOEC, POEM	City of Portland, TriMet	LT Ongoing	B/C: Technological interconnectivity for communicating with people and services in the field will ensure populations in hazard areas are being alerted to danger so they can effectively respond and avoid or reduce impact of a disaster or emergency. TF: This activity involves effective communication and staff resources; this activity is ongoing demonstrating its feasibility.
LT MH #8	1,2,5,6,7	Review and amend City Code and other compliance documentation to require that all facilities that store or handle hazardous materials (including large tanks) and which are located in the 500-year floodplain, landslide, or other hazard areas, develop a hazardous materials inventory statement. This statement will be made available for Fire Bureau review. Require that these storage tanks are either adequately protected or relocated outside of the 500 year floodplain, landslide, or other hazard areas. (asset management) (NFIP Compliance)	High	BF&R, POEM, BDS	City of Portland, DHS	LT Ongoing	B/C: Implementing this mitigation activity will potentially reduce ancillary HAZMAT damages from earthquakes, floods, landslides and other potential hazards. TF: This type activity is technically feasible within the community typically using existing labor, equipment and materials.
LT MH #9	2,5	Identify and pursue funding opportunities from outside agencies to fund and implement identified mitigation projects and activities. (education, outreach)	High	All bureaus	City of Portland, FEMA HMA, FEMA AFG, FP&S, SAFER, EFSP, DHS, NRCS, LGP	New LT	B/C: Although primarily a funding strategy the development of a plan for funding will aid in the decisions for implementation. This activity is essential for the City as there are limited funds available to accomplish effective mitigation actions. TF: This activity is ongoing demonstrating its feasibility.
LT MH #10	2,5,7	Assess the stability of levees in the Columbia Corridor Area and develop appropriate emergency plans to address potential levee failure and associated hazards. (planning)	High	POEM, Water, BF&R, BES, PBOT	City of Portland	New LT Ongoing	B/C: Pre-identification ensures that structures perform appropriately during impacts and are built with the hazard as a focus. TF: This is feasible using existing resources as the community has access to levee project reports and studies.
LT MH #11	2,4,5,6,7	Support development of a multiple-agency plan for Marine Drive closure coordination. (planning)	High	POEM, Water	City of Portland	New LT Ongoing	B/C: Coordinated planning ensures effective damage avoidance or reduction and ensures proper attention is assigned to reduce losses and damage to structures and City residents. TF: This activity involves effective communication and staff resources; this activity is feasible for the City to complete. This activity is ongoing demonstrating its feasibility.
LT EQ #11	5,6,7	Work with local jurisdictions to assess the capacity of landfill to accommodate earthquake debris: develop coordination plans for disposal of debris in the aftermath of an earthquake. (planning)	High	POEM, PBOT, BPS	City of Portland, FEMA HMA	LT Ongoing	B/C: Coordinated planning ensures effective damage avoidance or reduction and ensures proper attention is assigned to reduce losses and damage to structures and City residents. TF: This activity involves effective communication and staff resources; this activity is feasible for the City to complete. This activity is ongoing demonstrating its feasibility.

Table 5-6-1a Benefit Vs. Cost Analysis

ACTION ID	GOALS	DESCRIPTION	PRIORITIZATION (HIGH, MEDIUM, LOW)	RESPONSIBLE & COORDINATING BUREAUS & AGENCIES	POTENTIAL FUNDING AGENCIES	TIMEFRAME	(B/C) BENEFIT-COSTS (TF) TECHNICAL FEASIBILITY
New MH	2,5,6,7	Cross reference and incorporate mitigation planning provisions into all community planning processes such as comprehensive, capital improvement and land use plans, to demonstrate multiple bureau benefits and strengthen eligibility from multiple funding sources. This action is also identified in LTFL#8, IS#94 & SW#117. (planning)	High	POEM, BPS, BF&R, PBOT, Water, BES	City of Portland	LT Ongoing	B/C: By cross referencing many bureau plans that affect actions other than hazard mitigation and identifying the impact of the bureau plan on mitigating disaster the cost of implementation can have an add value benefit. TF: This activity involves effective communication and staff resources; this activity is feasible for the City to complete. This activity is ongoing demonstrating its feasibility.
New MH	1,2,3,5,6	Identify and list repetitively flooded structures and infrastructures, analyze the threat to these facilities and prioritize mitigation actions to protect the threatened population. (NFIP Compliance)	High	BPS, PBOT, BES, POEM; State Floodplain Manager	City of Portland, FEMA HMA, NRCS	New LT Ongoing	B/C: Flood hazard mitigation is among FEMA’s highest national priorities. FEMA desires communities focus on repetitive flood loss properties. This activity will ensure the City Council focuses on priority flood locations and projects. TF: This project is feasible as funding becomes available using effective communication, staff resources and existing facilities. This activity is feasible for the City to complete and is ongoing demonstrating its feasibility.
New Reworded MH	1,2,4,5	Acquire (buy-out), demolish, or relocate structures from hazard prone area. Property deeds shall be restricted for open space uses in perpetuity to keep people from rebuilding in hazard areas. (planning) (NFIP Compliance)	High	BPS, PBOT, BES, POEM; State Floodplain Manager, BGS, BP&R, BDS, BES, Risk Management	City of Portland, FEMA HMA, FEMA AFG, FP&S, SAFER, DHS, NRCS,	New LT Ongoing	B/C: Flood hazard mitigation is among FEMA’s highest national priorities. F This activity will ensure the City Council focuses on priority flood locations and projects to remove threatened structures from the floodplain and other hazard areas, eliminating future damage while keeping land clear for perpetuity. 7TF: This project is feasible as funding becomes available using existing staff skills, equipment and materials.
New MH	2,5,6	Develop and incorporate building ordinances commensurate with building codes to reflect survivability from all hazards to ensure occupant safety. (NFIP Compliance)	High	POEM, BDS, BPS	City of Portland	New LT Ongoing	B/C: Coordinated planning through building codes and ordinances can reveal how one action by a developer or a construction technique to cost less and provide more protection to the property owner or the community. TF: This activity involves effective communication and staff resources; this activity is ongoing demonstrating its feasibility.
New MH	1,5,6	Update the Infrastructure Master Plan and System Vulnerability Assessment, Sewer Failure Response Plan. (asset management, planning)	High	POEM, BPS, Water, PBOT, BES, OMF, BDS, BP&R, PDC,	City of Portland	New LT	B/C: Infrastructure vulnerability location pre-identification ensures effective damage avoidance or reduction and ensures proper attention is assigned to reduce losses and damage to structures and City residents. TF: This activity involves effective communication and staff resources; this activity is feasible for the City to complete. This activity is ongoing demonstrating its feasibility.
NEW MH	5,6,7	Partner with agencies to develop a west side operations center to be used during an emergency if the east side ECC and other City facilities become inoperable.	A.1 High	POEM, BF&R, Police	City of Portland,	New LT	B/C: Alternate operations locations away from known hazard areas and accessible to resources are essential for sustainability and operations continuity. TF: This activity is technically feasible within the community using existing facility acquisition processes.
New MH	2,5,6	Promote 09 Climate Action Plan action items with similarities to adaptation planning and mitigation actions. (planning)	A.2 HIGH	POEM, BPS	City of Portland	New LT	B/C: Coordinated planning ensures effective damage avoidance or reduction and ensures proper attention is assigned to reduce losses and damage to structures and City residents. TF: This activity involves effective communication and staff resources; this activity is feasible for the City to complete. This activity is ongoing demonstrating its feasibility.

Table 5-6-1a Benefit Vs. Cost Analysis

ACTION ID	GOALS	DESCRIPTION	PRIORITIZATION (HIGH, MEDIUM, LOW)	RESPONSIBLE & COORDINATING BUREAUS & AGENCIES	POTENTIAL FUNDING AGENCIES	TIMEFRAME	(B/C) BENEFIT-COSTS (TF) TECHNICAL FEASIBILITY
ST EQ #2	5,6	Assess existing earthquake related mitigation plans and vulnerability studies to identify areas of conflict, duplication or gaps between studies & secondary hazards of earthquake. (planning)	High	POEM, BF&R, PBOT, BES, Water, BDS, BPS	City of Portland	ST Ongoing	B/C: Infrastructure vulnerability location pre-identification ensures effective damage avoidance or reduction and ensures proper attention is assigned to reduce losses and damage to structures and City residents. TF: This activity involves effective communication and staff resources; this activity is feasible for the City to complete. This activity is ongoing demonstrating its feasibility.
ST EQ #3	6	Update the vulnerability analysis of Columbia Boulevard Wastewater Treatment Plant (CBWTP0 Tryon Creek Wastewater Treatment Plant (TCWTP) and wastewater pump stations. (asset management, planning)	High	BES, PBOT	City of Portland	ST Ongoing	B/C: Infrastructure vulnerability location pre-identification ensures effective damage avoidance or reduction and ensures proper attention is assigned to reduce losses and damage to structures and City residents. TF: This activity involves effective communication and staff resources; this activity is feasible for the City to complete. This activity is ongoing demonstrating its feasibility.
ST EQ #4	6	Prioritize the return of power to treatment plants (Tryon Creek and Columbia Boulevard) and pump stations.	High	BES, POEM	City of Portland, PGE	ST Ongoing	B/C: Redundant capability is essential for sustainability and operations continuity ensuring City water utility sustainability and the population's health and safety. TF: This activity is technically feasible within the community through partnership agreements or memoranda to maximize existing utility infrastructure availability.
ST EQ #8	5	Study the feasibility of mandatory or voluntary installation of seismic shutoff valves on natural gas meters at commercial and residential buildings.	Medium	BF&R, BDS, POEM	City of Portland, FEMA HMA, FEMA AFG, FP&S, SAFER, EFSP, DHS, NRCS,	ST	B/C: Coordinated legislation ensures consistency, enforcement and protection to the City's population and resource expenditure reduction. TF: This activity is technically feasible and involves effective communication and staff resources; this activity is feasible for the City to complete.
LT EQ #3	2,6	Develop a plan to strengthen sewer infrastructure in areas where street overlays and sewers have potential to collapse in a seismic event. (asset management)	Medium	PBOT, CGIS; BES, Water, POEM	City of Portland	LT Ongoing	B/C: Coordinated planning ensures effective damage avoidance or reduction and ensures proper attention is assigned to reduce losses and damage to structures and City residents. TF: This activity involves effective communication and staff resources; this activity is feasible for the City to complete. This activity is ongoing demonstrating its feasibility.
LT EQ #6	1,5,6	Assess the vulnerability of the water distribution system to seismic events: work toward hardening the system.	Low	Water	City of Portland	LT Ongoing	B/C: Infrastructure vulnerability location pre-identification ensures effective damage avoidance or reduction and ensures proper attention is assigned to reduce losses and damage to structures and City residents. TF: This activity involves effective communication and staff resources; this activity is feasible for the City to complete. This activity is ongoing demonstrating its feasibility.
LT EQ #8	5,6	Study development regulations and policies to ascertain if regulations can be made to limit development of high risk facilities in known areas of earthquake hazards.	Low	POEM, BDS, BPS, PBOT, BF&R	City of Portland	LT Ongoing	B/C: Coordinated planning ensures effective damage avoidance or reduction and ensures proper attention is assigned to reduce losses and damage to structures and City residents. TF: This activity involves effective communication and staff resources; this activity is feasible for the City to complete. This activity is ongoing demonstrating its feasibility.
SW #2	2,5,6	Acquire an additional facility for storage of anti-icing materials and expand anti-icing vehicle inventory.	Low	PDOT BDS, Facilities, Vehicle Services	City of Portland	ST Ongoing	B/C: Strategically pre-located additional facilities ensure that materials and resources are able to quickly respond to emergency situations or conditions. TF: This project is feasible using existing staff skills, equipment and materials when funding is available.

Table 5-6-1a Benefit Vs. Cost Analysis

ACTION ID	GOALS	DESCRIPTION	PRIORITIZATION (HIGH, MEDIUM, LOW)	RESPONSIBLE & COORDINATING BUREAUS & AGENCIES	POTENTIAL FUNDING AGENCIES	TIMEFRAME	(B/C) BENEFIT-COSTS (TF) TECHNICAL FEASIBILITY
ST SW #6	2,3,5	Insulate residential buildings that house at-risk populations.	Low	PDC	City of Portland, FEMA HMA	ST Ongoing	B/C: This activity would reduce health and heating costs for high risk populations TF: This project is feasible using existing staff skills, equipment and materials.
ST SW #7	5,6	Prioritize existing building stock for active review of Title 29 (Dangerous Building Code) This needs to be updated with intern information or information sent from individuals that are on the team.	Medium	BDS	City of Portland	ST Ongoing	B/C: Pre-identification ensures that structures are appropriately coded and prioritized for removal or rehabilitation – appropriately addressing known or potential hazard impacts. TF: This activity involves effective communication and staff resources; this activity is feasible for the City to complete. This activity is ongoing demonstrating its feasibility.
ST FL #1	2,5	A covenant is recorded with the deed of new development in the floodplain to ensure that space below the BFE is not converted to habitable space. This should be codified to improve compliance. (NFIP Compliance)	High	BDS	City of Portland	ST Ongoing	B/C: Coordinated planning ensures effective damage avoidance or reduction and ensures proper attention is assigned to reduce losses and damage to structures and City residents. TF: This activity involves effective communication and staff resources; this activity is feasible for the City to complete. This activity is ongoing demonstrating its feasibility.
ST FL #2	2,4,5,6	Continue to co-fund improvements to river and stream gauges in the Portland metropolitan area with the United Geological Survey.	Low	BDS	City of Portland, NOAA/NWS	ST Ongoing	B/C: This ongoing activity is essential for the City as there are limited funds available to accomplish effective mitigation actions. This joint effort strengthens County and City warning capabilities. TF: Fund acquisition is a continuous ongoing activity demonstrating its feasibility.
ST FL #4	5,6,7	Secure the agreements necessary to design and implement the redevelopment of Freeway Land Company site. (within the Lents Urban Renewal Area)	High	BES, PDC; BPS, PBOT, BP&R	City of Portland	ST Ongoing	B/C: Coordinated planning effort ensures effective damage avoidance or reduction and ensures proper attention is assigned to reduce losses and damage to structures and City residents. TF: This activity involves effective communication and staff resources; this activity is feasible for the City to complete. This activity is ongoing demonstrating its feasibility.
ST FL #5	2,3,4,5,6	Acquire outside funding to hire a consultant to lead the application process to maintain a Class 5 rating when the City seeks Community Rating System re-certification.	High	BES, BDS, BPS; Parks, POEM, PBOT	City of Portland	ST Ongoing	B/C: This ongoing activity is essential for the City as there are limited funds available to accomplish effective mitigation actions. TF: This activity is ongoing demonstrating its feasibility.
ST FL #6	5,6,7	Support Multnomah County Drainage District (MCDD) in the continued calibration and update of hydraulic models for conveyance and internal flood impacts to the four floodplains managed by MCDD #1.	Medium	POEM, BES, BPS	City of Portland, NOAA/NWS	ST Ongoing	B/C: Coordinated planning, mapping and modeling ensures effective damage avoidance or reduction and ensures proper attention is assigned to reduce losses and damage to structures and City residents. TF: This project is feasible using existing staff skills, equipment and materials.
ST FL #8	5,7	Identify funding for the design and construction of the Springwater Wetlands Complex, a 30-acre floodplain wetland restoration project in the Lents area of Johnson Creek.	High	BES,BPS, Parks and Recreation	City of Portland, FEMA HMA, NOAA/NWS, NRCS, USACE	ST Ongoing	B/C: This ongoing activity is essential for the City as there are limited funds available to accomplish effective mitigation actions. TF: This activity is ongoing demonstrating its feasibility.

Table 5-6-1a Benefit Vs. Cost Analysis

ACTION ID	GOALS	DESCRIPTION	PRIORITIZATION (HIGH, MEDIUM, LOW)	RESPONSIBLE & COORDINATING BUREAUS & AGENCIES	POTENTIAL FUNDING AGENCIES	TIMEFRAME	(B/C) BENEFIT-COSTS (TF) TECHNICAL FEASIBILITY
ST FL #9	3,4,5,6,7	Secure funding to implement the passive flood management projects that are recommended in the Johnson Creek Restoration Plan & other watershed management plans. Coordinate with Portland Development Commission's urban renewal efforts in Lents and with other partners in other parts of the watershed.	High	BES, BP&R, PDC	City of Portland, FEMA HMA, NOAA/NWS, NRCS, USACE	ST Ongoing	B/C: This ongoing activity is essential for the City as there are limited funds available to accomplish effective mitigation actions. TF: This activity supports project options and is an ongoing initiative demonstrating its feasibility.
ST FL #10	4,6	Improve definitions and refine standards for stormwater retention in the Storm water Management Manual.	High	BES, BDS, BPS	City of Portland	ST Ongoing	B/C: Coordinated planning ensures effective damage avoidance or reduction and ensures proper attention is assigned to reduce losses and damage to structures and City residents. TF: This activity involves effective communication and staff resources; this activity is feasible for the City to complete. This activity is ongoing demonstrating its feasibility.
LT FL #1	4,5,6,7	Increase funding for the Johnson Creek Willing Seller Program; establish willing seller programs in other watersheds where flood hazard and priority restoration areas coexist. (NFIP Compliance)	High	BES, BP&R, BPS, Water	City of Portland, FEMA HMA, NRCS	LT Ongoing	B/C: This ongoing activity is essential for the City as there are limited funds available to accomplish effective mitigation actions. This program has proved very successful at removing structures from the floodplain. TF: This activity has removed structures from hazard areas and is an ongoing initiative demonstrating its feasibility.
LT FL #3	2,3,5,6	Develop a plan for addressing flooding in the Holgate Lake area. (planning) (NFIP Compliance)	High	BES,BDS, BP&R, BPS	City of Portland, FEMA HMA, USACE	LT Ongoing	B/C: Coordinated planning ensures effective damage avoidance or reduction and ensures proper attention is assigned to reduce losses and damage to structures and City residents. TF: This activity involves effective communication and staff resources; this activity is feasible for the City to complete. This activity is ongoing demonstrating its feasibility.
LT FL #4	2,5	Improve hydraulic bottleneck that prevents discharge of chlorinated effluent to the Willamette River during high river levels. (NFIP Compliance)	High	BES	City of Portland, USACE	LT	B/C: Hydraulic bottlenecks develop excess pressure which eliminates water force control due to excessive water volumes beyond facility capacity. This project will effectively mitigate chlorinated effluent discharge in to the Willamette River during high water flow flood events. The City relies heavy on the numerous bridge trestles that span the river systems ensuring access and resource transportation. Upgrading the trestles ensures efficient access and reduces delays in goods and passenger delivery. TF: This project is technically feasible using existing staff skills, equipment, materials and resources as funding becomes available.
LT FL #5	2,3,5,6	As Waterfront Park remodeling is designed, ensure that Portland's downtown property and critical facilities remain protected from floodwaters. (asset management)	High	BP&R, BF&R BPS, BDS	City of Portland	LT Ongoing	B/C: This project is essential for sustainability and operations continuity ensuring City infrastructure and the population's remain protected from potential flood impacts during reconstruction ensuring their health and safety. TF: This activity is technically feasible within the community through partnership agreements or memoranda to maximize existing utility infrastructure availability.

Table 5-6-1a Benefit Vs. Cost Analysis

ACTION ID	GOALS	DESCRIPTION	PRIORITIZATION (HIGH, MEDIUM, LOW)	RESPONSIBLE & COORDINATING BUREAUS & AGENCIES	POTENTIAL FUNDING AGENCIES	TIMEFRAME	(B/C) BENEFIT-COSTS (TF) TECHNICAL FEASIBILITY
LT FL #6/#7	2,5,6,7	Partner with Army Corps of Engineers to conduct modeling of the Willamette River upstream of Portland to identify areas that, if acquired or restored, would contribute to mitigate of peak flows in Portland or result in significant reduction of flood damages. (NFIP Compliance)	High	BES	City of Portland, NOAA/NWS, USACE	LT Deferred	B/C: Coordinated planning, mapping and modeling ensures effective damage avoidance or reduction and ensures proper attention is assigned to reduce losses and damage to structures and City residents. TF: This activity involves effective communication and staff resources; this activity is feasible for the City to complete. This activity is ongoing demonstrating its feasibility.
LT FL #8	2,5,6,7	Develop goals, policies and implementation measures to manage the amount of new impervious surface and remove existing impervious surfaces where appropriate. These goals, policies and measures may be at the citywide, watershed, or sub-watershed level. (planning) (NFIP Compliance)	High	BPS, BES, BDS, PBOT	City of Portland, FEMA HMA, FEMA AFG, FP&S, SAFER, NOAA/NWS, NRCS, USACE	LT Ongoing	B/C: Coordinated planning ensures effective damage avoidance or reduction and ensures proper attention is assigned to reduce losses and damage to structures and City residents. TF: This activity involves effective communication and staff resources; this activity is feasible for the City to complete. This activity is ongoing demonstrating its feasibility.
LT FL #9	2,5	Upgrade trestles that carry the main conduits of the water delivery system. (Sandy River Crossing interties completed) (asset management)	High	Water	City of Portland, FEMA HMA, USACE	LT Deferred	B/C: The City relies heavy on the numerous bridge trestles that span the river systems ensuring access and resource transportation. Upgrading the trestles ensures efficient access and reduces delays in goods and passenger delivery. TF: This project is technically feasible using existing staff skills, equipment, materials and resources as funding becomes available.
FL #10	2,5	Create redundancy in the water delivery system at the three Sandy River crossings by burying conduits under the river (in progress).	Medium	Water	City of Portland	LT Ongoing	B/C: Redundant capability is essential for sustainability and operations continuity ensuring City water utility sustainability and the population's health and safety. TF: This activity is technically feasible within the community through partnership agreements or memoranda to maximize existing utility infrastructure availability.
LT FL #11	2,5,6,7	Provide funding for and participate in development of a flood inundation model for the managed floodplains and downtown sea wall. (mapping) (NFIP Compliance)	Medium	POEM, BES, Water	City of Portland, FEMA HMA, NOAA/NWS, NRCS, USACE	LT Ongoing	B/C: This ongoing activity is essential for the City as there are limited funds available to accomplish effective mitigation actions. TF: This activity supports project options and is an ongoing initiative demonstrating its feasibility.
LT FL #12	2,5	Install a river gauge in the vicinity of the bridge over Johnson Creek at 108 th . The gauge should be able to send data to remote monitoring sites.	Medium	POEM , PBOT, Police, Water	City of Portland, NOAA/NWS	LT Ongoing	B/C: The river gauge is essential to provide the City with essential early water level fluctuation warning. TF: This project is feasible using existing staff skills, equipment and materials.
LT FL #13	2,5	Install one-way valves on the outlet pipes of the storm inlets on SE Foster Road between 101 st and 112 th .	Low	PBOT, BES	City of Portland, FEMA HMA, NRCS, USACE	LT Ongoing	B/C: The one-way valve will protect the system from reverse flow forces minimizing or eliminating damage impacts. TF: This project is feasible using existing staff skills, equipment and materials.
FL		Complete update to the Johnson Creek Restoration Plan. Develop individual plans for each subwatershed to address the sources of excess stormwater runoff that exacerbates flooding. (NFIP Compliance)	High	POEM	City of Portland, USACE	LT	B/C: Coordinated planning ensures effective damage avoidance or reduction and ensures proper attention is assigned to reduce losses and damage to structures and City residents. TF: This activity is technically feasible and involves effective communication and staff resources; this activity is feasible for the City to complete.

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ACTION ID	GOALS	DESCRIPTION	PRIORITIZATION (HIGH, MEDIUM, LOW)	RESPONSIBLE & COORDINATING BUREAUS & AGENCIES	POTENTIAL FUNDING AGENCIES	TIMEFRAME	(B/C) BENEFIT-COSTS (TF) TECHNICAL FEASIBILITY
FL	2,5	Establish flood mitigation priorities for critical facilities and residential and commercial buildings located within the 100- year floodplain using survey elevation data. (NFIP Compliance)	Low	POEM, All bureaus	City of Portland, FEMA HMA, USACE	LT	B/C: This project would reduce risk to infrastructure and residential properties by elevating, relocation, or providing location appropriate measures to reduce flood damage to threatened structures within the floodplain. TF: This activity is technically feasible and involves effective communication and staff resources; this activity is feasible for the City to complete.
ST-LS #1	4,6	Continue to maintain and Improve internal City communications to facilitate coordination of landslide mitigation activities. (education, outreach)	High	BDS, BES, PBOT, Water, BP&R, Risk Management	City of Portland	ST Ongoing	B/C: Coordinated planning ensures effective damage avoidance or reduction and ensures proper attention is assigned to reduce losses and damage to structures and City residents. TF: This activity involves effective communication and staff resources; this activity is feasible for the City to complete. This activity is ongoing demonstrating its feasibility.
ST-LS #3	2,5,6	Mitigate Portland's water supply infrastructure from landslide hazards. (asset management)	High	Water	City of Portland, FEMA HMA, USACE	ST Ongoing	B/C: The water supply is essential for the entire City populations, survivability, health and safety. TF: This project is technically feasible as funding becomes available to procure engineering/design, procurement and construction capability.
ST-LS # 4	5,6	Initiate more operations and maintenance pilot projects along roads that inform about the development of standards for managing stormwater in ditches in landslide prone areas. (education, outreach)	High	BES, PBOT	City of Portland, FEMA HMA, USACE	ST Ongoing	B/C: Past Pilot Programs have effectively sustained mitigation outreach efforts with minimal cost and helped build and support area-wide capacity. This activity enables the public to prepare for, respond to and recover from disasters. TF: This low cost activity can be combined with recurring outreach opportunities at meetings where hazard specific information can be presented in small increments. This activity is ongoing demonstrating its feasibility.
LT-LS # 1	2,3,6	Develop a comprehensive landslide map for the City of Portland to identify hazard areas and to improve communications with the public. (mapping)	High	BDS, BPS, Water, BES, PBOT, BP&R	City of Portland	LT Ongoing	B/C: Coordinated mapping ensures effective damage avoidance or reduction and ensures proper attention is assigned to reduce losses and damage to structures and City residents. TF: This is feasible using existing resources. The City's possesses GIS infrastructure to easily accomplish this task.
New LT LS #3	1,3,4,6	Evaluate the role of drainage systems in the West Hills, including pipes, streams and drainage ways and options for protecting and improving their functions and increasing their resiliency. (planning)	High	BDS, BPS, Water, BES, PBOT, BP&R	City of Portland	LT Ongoing	B/C: Coordinated planning ensures effective damage avoidance or reduction and ensures proper attention is assigned to reduce losses and damage to structures and City residents. TF: This activity involves effective communication and staff resources; this activity is feasible for the City to complete. This activity is ongoing demonstrating its feasibility.
LT LS #4	5,6	Review the effectiveness of existing regulations related to development in landslide hazard areas. (planning)	High	BDS, BPS, BES	City of Portland	LT Ongoing	B/C: Coordinated planning ensures effective damage avoidance or reduction and ensures proper attention is assigned to reduce losses and damage to structures and City residents. TF: This activity involves effective communication and staff resources; this activity is feasible for the City to complete. This activity is ongoing demonstrating its feasibility.
LT-LS #6	2,4,5	Employ alternative construction methods such as trenchless construction on City projects to reduce the impact that development can have in landslide prone areas.	Low	BES	City of Portland	LT Ongoing	B/C: Alternative construction methods dramatically reduce soil disturbance impacts, which prevents or reduces landslide susceptibility. TF: This project is feasible using existing staff skills, equipment and materials.

Table 5-6-1a Benefit Vs. Cost Analysis

ACTION ID	GOALS	DESCRIPTION	PRIORITIZATION (HIGH, MEDIUM, LOW)	RESPONSIBLE & COORDINATING BUREAUS & AGENCIES	POTENTIAL FUNDING AGENCIES	TIMEFRAME	(B/C) BENEFIT-COSTS (TF) TECHNICAL FEASIBILITY
LT LS #7	2,4,5,6	Continue development of standards for small pump stations as an alternative to gravity sewers in accessible or high risk areas.	Low	BES, BDS	City of Portland	LT Ongoing	B/C: Coordinated planning ensures effective damage avoidance or reduction and ensures proper attention is assigned to reduce losses and damage to structures and City residents. TF: This activity involves effective communication and staff resources; this activity is feasible for the City to complete. This activity is ongoing demonstrating its feasibility.
ER #	2.5	Develop recommendations for high and low ranking streamside plants that provide more erosion control, such as reducing erosion from high water and wave actions.	Medium	BES, BP&R, BPS	City of Portland, FEMA HMA, FEMA AFG, FP&S, NRCS	ST	B/C: This project would reduce erosion risk to infrastructure and residential properties using effective native vegetation bank stabilization measures to reduce erosion damage to threatened structures. TF: This activity is technically feasible and involves effective communication and staff resources; this activity is feasible for the City to complete.
ER#	2,5	Implement projects that <i>retain native vegetation</i> , increase vegetation diversity and increase the complexity of the vegetation strata (having three vegetation strata: herbs, shrubs, trees).	High	BES, BDS	City of Portland, FEMA AFG, FP&S, NRCS	ST	B/C: This project would reduce erosion risk to infrastructure and residential properties using effective native vegetation bank stabilization measures to reduce erosion damage to threatened structures. TF: This activity is technically feasible and involves effective communication and staff resources; this activity is feasible for the City to complete.
ER#	2,3.5.6	Implement policies to increase the extent of coverage of the Greenway zones along the rivers and further limit proposed activities within these areas.	High	Mosaic Consulting Sheriff River Patrol	City of Portland	ST	B/C: Coordinated legislation ensures consistency, enforcement and protection to the City's population and resource expenditure reduction. TF: This activity is technically feasible and involves effective communication and staff resources; this activity is feasible for the City to complete.
ER#	2,5	Develop standards for soil backfill in vegetated areas, especially sloped areas. (planning)	High	BES	City of Portland, FEMA HMA, FEMA AFG, FP&S, SAFER, DHS, NRCS	LT	B/C: This project would reduce erosion risk to infrastructure and residential properties using effective native vegetation bank stabilization measures to reduce erosion damage to threatened structures. TF: This activity is technically feasible and involves effective communication and staff resources; this activity is feasible for the City to complete.
ER#	2,5	Establish regulations that prevent installation of slopes steeper than 3:1 and prohibit development on slopes steeper than 3:1. (planning)	High	BDS, BPS, BES	City of Portland	LT	B/C: Coordinated legislation ensures consistency, enforcement and protection to the City's population and resource expenditure reduction. TF: This activity is technically feasible and involves effective communication and staff resources; this activity is feasible for the City to complete.
ER#	2,5	Implement projects that layback and/or regrade riverbank slopes and secure wetland sod mats composed of native emergent/grasses, etc.	High	BP&R	City of Portland FEMA HMA, FEMA AFG, FP&S, SAFER, NRCS	LT	B/C: This project would reduce erosion risk to infrastructure and residential properties using effective native vegetation bank stabilization measures to reduce erosion damage to threatened structures. TF: This activity is technically feasible and involves effective communication and staff resources; this activity is feasible for the City to complete.
ER#	2,5	Construct and install bio-engineered slope protective measures to reduce or eliminate erosion	High	BP&R	City of Portland, City of Portland FEMA HMA, FEMA AFG, FP&S, SAFER, NRCS	LT	B/C: This project would reduce erosion risk to infrastructure and residential properties using effective native vegetation bank stabilization measures to reduce erosion damage to threatened structures. TF: This activity is technically feasible and involves effective communication and staff resources; this activity is feasible for the City to complete.
ER#	2,5	Implement projects that increase large wood structures that act to soften the effect of wave action on shorelines as well as provide habitat for migrating salmonids.	High	BES	City of Portland, City of Portland FEMA HMA, FEMA AFG, FP&S, SAFER, NRCS, USACE	LT	B/C: This project would reduce erosion risk to infrastructure and residential properties using effective native vegetation bank stabilization measures to reduce erosion damage to threatened structures. TF: This activity is technically feasible and involves effective communication and staff resources; this activity is feasible for the City to complete.

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ACTION ID	GOALS	DESCRIPTION	PRIORITIZATION (HIGH, MEDIUM, LOW)	RESPONSIBLE & COORDINATING BUREAUS & AGENCIES	POTENTIAL FUNDING AGENCIES	TIMEFRAME	(B/C) BENEFIT-COSTS (TF) TECHNICAL FEASIBILITY
ER#	2,5	Secure large wood [boles w/ attached root wads] or log rafts to reduce high wave action that can result in erosion.	High	BP&R	City of Portland, City of Portland FEMA HMA, FEMA AFG, FP&S, SAFER, NRCS, USACE	LT	B/C: This project would reduce erosion risk to infrastructure and residential properties using effective native vegetation bank stabilization measures to reduce erosion damage to threatened structures. TF: This activity is technically feasible and involves effective communication and staff resources; this activity is feasible for the City to complete.
ST WF #1	5,6	Consolidate unassigned and/or unmanaged vegetated areas owned by the City under a single land management umbrella. (asset management)	Low	BP&R, BES, Water, PBOT, BGS	City of Portland	ST	B/C: Coordinated planning ensures effective damage avoidance or reduction and ensures proper attention is assigned to reduce losses and damage to structures and City residents. TF: This activity involves effective communication and staff resources; this activity is feasible for the City to complete. This activity is ongoing demonstrating its feasibility.
ST WF #2	3,5,6	Procure funding for management of vegetated natural areas with high wildfire danger, including public and private properties.	High	BP&R, BF&R, BPS, BES, PBOT BGS	City of Portland, FEMA FP&S, NRCS	ST Ongoing	B/C: This ongoing activity is essential for the City as there are limited funds available to accomplish effective mitigation actions. TF: This activity is ongoing demonstrating its feasibility.
ST WF #4	3,5,6	Provide wildfire management training to staff. (education, outreach)	High	BF&R, BP&R, BES, Water, PBOT	City of Portland, FEMA AFG, FP&S, SAFER	ST	B/C: Consistent raining ensures individuals develop tuned situational response that greatly reduces hesitation during intense emergency situations. TF: This project is feasible using existing staff skills, equipment and materials.
ST WF #5	5,6,7	Amend the Portland Plant List and other related City plant lists and landscaping guides to include/identify fire resistant native plants and planting strategies that could be encouraged or required in local landscaping. (planning)	Low	BPS, BDS, BF&R BP&R, BES, PBOT	City of Portland, FEMA AFG, FP&S, SAFER	ST Ongoing	B/C: Coordinated planning ensures effective damage avoidance or reduction and ensures proper attention is assigned to reduce losses and damage to structures and City residents. TF: This activity involves effective communication and staff resources; this activity is feasible for the City to complete. This activity is ongoing demonstrating its feasibility.
ST WF #6	5,6	Integrate, as appropriate, fire prevention goals and provisions into City policies, plans and codes. Identify and address ambiguities or conflicts among city requirements. (planning)	High	BPS, BDS, BF&R, BP&R, BES, PBOT	City of Portland	ST Ongoing	B/C: Coordinated planning ensures effective damage avoidance or reduction and ensures proper attention is assigned to reduce losses and damage to structures and City residents. TF: This activity involves effective communication and staff resources; this activity is feasible for the City to complete. This activity is ongoing demonstrating its feasibility.
ST WF #7	2,6	Identify conditions of approval and mitigation strategies that could be applied to new development or redevelopment in high risk areas.	High	BDS, BPS, BP&R, BF&R, BES, PBOT	City of Portland	ST Ongoing	B/C: Coordinated technical guidance ensures effective damage avoidance or reduction and ensures proper attention is assigned to reduce losses and damage to structures and City residents. TF: This activity involves effective communication and staff resources; this activity is feasible for the City to complete. This activity is ongoing demonstrating its feasibility.
ST WF #9	2,3,5	Improve the system for identifying new construction in areas subject to wildfires and communicating this information to the affected land owners. (planning)	High	BDS, BF&R, Water, PBOT, ONI, BPS	City of Portland, FEMA FP&S	ST Ongoing	B/C: Coordinated technical guidance ensures effective damage avoidance or reduction and ensures proper attention is assigned to reduce losses and damage to structures and City residents. TF: This activity involves effective communication and staff resources; this activity is feasible for the City to complete. This activity is ongoing demonstrating its feasibility.

Table 5-6-1a Benefit Vs. Cost Analysis

ACTION ID	GOALS	DESCRIPTION	PRIORITIZATION (HIGH, MEDIUM, LOW)	RESPONSIBLE & COORDINATING BUREAUS & AGENCIES	POTENTIAL FUNDING AGENCIES	TIMEFRAME	(B/C) BENEFIT-COSTS (TF) TECHNICAL FEASIBILITY
ST WF #10	1,3,6	Conduct systematic reviews of Portland’s large, publicly owned, wildland tracts regarding fire safety and ecological health to ensure informed land management decisions. (asset management)	High	BP&R, BES, BF&R, Water, BPS, PBOT, ONI	City of Portland	ST	B/C: Coordinated technical guidance ensures effective damage avoidance or reduction and ensures proper attention is assigned to reduce losses and damage to structures and City residents. TF: This project is feasible using existing staff skills, equipment and materials.
ST WF #11	2,3,7	Adopt the national “Fire Danger Rating System” and install the signs at key points in the City.	High	BF&R, ONI	City of Portland	ST	B/C: Coordinated technical guidance ensures effective damage avoidance or reduction and ensures proper attention is assigned to reduce losses and damage to structures and City residents. TF: This project is feasible using existing staff skills, equipment and materials.
ST WF #12	3,5,6	Implement a neighborhood wildland interface disaster planning program. (education, outreach)	Medium	POEM, ONI, BF&R, Police	City of Portland, FEMA FP&S	ST	B/C: Coordinated planning ensures effective damage avoidance or reduction and ensures proper attention is assigned to reduce losses and damage to structures and City residents. TF: This activity involves effective communication and staff resources; this activity is feasible for the City to complete. This activity is ongoing demonstrating its feasibility.
ST WF #13	3,5	Review and potentially refine City contract specifications for machinery operations during “Red Flag” weather conditions. (asset management)	Low	BF&R, BES, BP&R, Water, PBOT	City of Portland	ST	B/C: Coordinated technical guidance ensures effective damage avoidance or reduction and ensures proper attention is assigned to reduce losses and damage to structures and City residents. TF: This project is feasible using existing staff skills, equipment and materials.
ST WF #14	1-7	Convene a standing wildland interface fire technical group. (planning)	High	BF&R, BP&R, BES, POEM, Water, PBOT, BDS, BPS	City of Portland, FEMA AFG, FP&S, SAFER	ST	B/C: Coordinated technical guidance ensures effective damage avoidance or reduction and ensures proper attention is assigned to reduce losses and damage to structures and City residents. TF: This activity involves effective communication and staff resources; this activity is feasible for the City to complete. This activity is ongoing demonstrating its feasibility.
ST WF #15	5,6	Index City wildfire mitigation plans and activities. (asset management)	Low	BF&R, BP&R, BES, POEM, PBOT, Metro, BDS, BPS	City of Portland	ST Ongoing	B/C: Coordinated planning ensures effective damage avoidance or reduction and ensures proper attention is assigned to reduce losses and damage to structures and City residents. TF: This activity involves effective communication and staff resources; this activity is feasible for the City to complete. This activity is ongoing demonstrating its feasibility.
WF	2,4,5,6	Develop and implement protocol for defining and mapping Wildland Urban Interface Zones and develop recommended policies, regulations and landscape options for incorporation into City plans and programs. (planning)	High	BF&R, BP&R, BES, POEM, PBOT, Metro, BDS, BPS	City of Portland, FEMA AFG, FP&S, SAFER	ST	B/C: Coordinated planning ensures effective damage avoidance or reduction and ensures proper attention is assigned to reduce losses and damage to structures and City residents. TF: This activity involves effective communication and staff resources; this activity is feasible for the City to complete. This activity is ongoing demonstrating its feasibility.
ST WF #16	2,6	Identify water grid engineering requirements for firefighting in wildfire areas. (asset management)	Medium	BF&R, Water	City of Portland, FEMA AFG, FP&S, SAFER	LT Ongoing	B/C: Resource pre-identification ensures resource availability during hazard events. Available hazard appropriate mapping enables effective planning and resource acquisition. TF: Feasible as financial resources become available. LiDAR will greatly enhance the City’s risk and vulnerability analysis through expanded mapping capability.

Table 5-6-1a Benefit Vs. Cost Analysis

ACTION ID	GOALS	DESCRIPTION	PRIORITIZATION (HIGH, MEDIUM, LOW)	RESPONSIBLE & COORDINATING BUREAUS & AGENCIES	POTENTIAL FUNDING AGENCIES	TIMEFRAME	(B/C) BENEFIT-COSTS (TF) TECHNICAL FEASIBILITY
LT WF #2	3,6,7	Review the feasibility of adopting portions of nationally recognized wildfire interface codes to strengthen building standards in wildfire risk areas.	Low	BF&R, BDS	City of Portland, FEMA AFG, FP&S, SAFER	LT Ongoing	B/C: Coordinated planning ensures effective damage avoidance or reduction and ensures proper attention is assigned to reduce losses and damage to structures and City residents. TF: This activity involves effective communication and staff resources; this activity is feasible for the City to complete. This activity is ongoing demonstrating its feasibility.
LT WF #3	1,6	Design and conduct a study to determine the effectiveness of maintenance agreements that are established when new land divisions are approved to manage vegetation in open space tracts.	High	BDS, BF&R, BP&R, BPS BES, PBOT, ONI	City of Portland	LT	B/C: Open space ensures no infrastructure or population occurs in known hazard areas. TF: Feasible as financial resources become available. LiDAR will greatly enhance the City's risk and vulnerability analysis through expanded mapping capability.
LT WF #4	1,4,6	Complete an assessment to characterize high priority wildfire risk areas and recommend specific mitigation strategies.	Medium	BF&R, BP&R, BES, BPS, BDS, Water, PBOT	City of Portland, FEMA AFG, FP&S, SAFER	LT Ongoing	B/C: Pre-identification ensures that structures are not placed inappropriately and are built with the hazard as a focus. Developing a mapping committee ensures a comprehensive approach to determining the City's mapping needs. TF: Feasible as financial resources become available. LiDAR will greatly enhance the City's risk and vulnerability analysis through expanded mapping capability.
LT WF #5	3,6,7	Explore avenues for funding wildfire interface home construction upgrades to low income homeowners.	Low	BF&R, BDS, ONI	City of Portland, FEMA HMA. AFG, FP&S, SAFER	LT Ongoing	B/C: This ongoing activity is essential for the City as there are limited funds available to accomplish effective mitigation actions. TF: This activity is ongoing demonstrating its feasibility.
WF	2,4,5,6	Act upon all Mitigation Actions outlined in the Wildfire GAP Analysis Report	High	BDS, BF&R, BPS, BP&R, BES, PBOT, ONI	City of Portland, FEMA AFG, FP&S, SAFER	LT	B/C: Coordinated planning ensures effective damage avoidance or reduction and ensures proper attention is assigned to reduce losses and damage to structures and City residents. TF: This activity involves effective communication and staff resources; this activity is feasible for the City to complete. This activity is ongoing demonstrating its feasibility.
IS #	2,5,6	Update Invasive Species Plants List by consolidating nuisance and prohibited plant lists into one "Nuisance Plants List" and assigning priority ranks to the Nuisance Plants List.	High	BPS	City of Portland, FEMA FP&S, NRCS	ST	B/C: Coordinated planning ensures effective damage avoidance or reduction and ensures proper attention is assigned to reduce losses and damage to structures and City residents. TF: This activity is technically feasible and involves effective communication and staff resources; this activity is feasible for the City to complete.
IS #	2,5,6	Clarify zoning regulations to require removal of plants on the Nuisance Plants List in the Environmental, Greenway and Pleasant Valley Natural Resources Overlay Zones and the Columbia South Shore and Johnson Creek Basin Plan Districts.	High Completed Jan2010	BPS	City of Portland	ST	B/C: Coordinated legislation ensures consistency, enforcement and protection to the City's population and resource expenditure reduction. TF: This activity is technically feasible and involves effective communication and staff resources; this activity is feasible for the City to complete.
IS #	2,5,6	Initiate a process to ensure the Erosion Control Manual be made consistent with City goals to control and eradicate invasive plants. (planning)	Low	BPS	City of Portland	LT	B/C: Coordinated planning ensures effective damage avoidance or reduction and ensures proper attention is assigned to reduce losses and damage to structures and City residents. TF: This activity is technically feasible and involves effective communication and staff resources; this activity is feasible for the City to complete.

Table 5-6-1a Benefit Vs. Cost Analysis

ACTION ID	GOALS	DESCRIPTION	PRIORITIZATION (HIGH, MEDIUM, LOW)	RESPONSIBLE & COORDINATING BUREAUS & AGENCIES	POTENTIAL FUNDING AGENCIES	TIMEFRAME	(B/C) BENEFIT-COSTS (TF) TECHNICAL FEASIBILITY
IS #	2,5,6	Initiate a process to ensure the Tree and Landscaping Manual, the Recommended Street Tree List and the Stormwater Management Manual be made consistent with City goals to control and eradicate invasive plants. (planning)	High	BPS	City of Portland	LT	B/C: Coordinated planning ensures effective damage avoidance or reduction and ensures proper attention is assigned to reduce losses and damage to structures and City residents. TF: This activity is technically feasible and involves effective communication and staff resources; this activity is feasible for the City to complete.
IS #	2,5,6	Coordinate with the Portland Plan project to help ensure that invasive species are addressed in the Comprehensive Plan update and Portland Plan work plan. (planning)	High	BPS	City of Portland	LT	B/C: Coordinated planning ensures effective damage avoidance or reduction and ensures proper attention is assigned to reduce losses and damage to structures and City residents. TF: This activity is technically feasible and involves effective communication and staff resources; this activity is feasible for the City to complete.
IS #	2,5,6	Research the feasibility of establishing a local noxious or invasive weed law.	High	BPS	City of Portland	LT	B/C: Coordinated legislation ensures consistency, enforcement and protection to the City's population and resource expenditure reduction. TF: This activity is technically feasible and involves effective communication and staff resources; this activity is feasible for the City to complete.
LT V #1	6,7	Work with the state and other impacted jurisdictions to implement and update the various volcano Inter-Agency Coordination Plans.	Low	POEM	City of Portland	LT Ongoing	B/C: Coordinated planning ensures effective damage avoidance or reduction and ensures proper attention is assigned to reduce losses and damage to structures and City residents. TF: This activity involves effective communication and staff resources; this activity is feasible for the City to complete. This activity is ongoing demonstrating its feasibility.
V	2,7	Work with the state and other impacted jurisdictions to implement and update the various volcano Inter-Agency Coordination Plans.	Low	POEM	City of Portland	LT	B/C: Coordinated planning ensures effective damage avoidance or reduction and ensures proper attention is assigned to reduce losses and damage to structures and City residents. TF: This activity involves effective communication and staff resources; this activity is feasible for the City to complete. This activity is ongoing demonstrating its feasibility.

5.7 CONTINUED PUBLIC INVOLVEMENT

DMA 2000 Requirements: Plan Maintenance Process - Continued Public Involvement

Requirement §201.6(c)(4)(iii): [The plan maintenance process shall include a] discussion on how the community will continue public participation in the plan maintenance process.

In the past five years of implementing the mitigation plan, the involved bureaus conducted outreach activities related to the 2004 NHMP projects. These activities addressed many of the mitigation action items and individual bureau projects.

Appendix C details the public involvement mechanisms (page C-4, Table C-2-1a) and the Planning Team meeting and tasks (C.2.2). Appendix D includes meeting information during the four month contracted update of the plan. Appendix F outlines the planning maintenance documents and expected procedures.

The City is dedicated to involving the public directly in the continual reshaping and updating of the NHMP. The Planning Team EMSC members are responsible for the annual review and update of the plan.

POEM will continue to identify opportunities for the public's engagement in implementation and NHMP update. Public participation will continue to be invited through a series of presentations to community organizations, such as neighborhood associations, business and industry associations and hazard specific councils and commissions. Copies of the plan will be posted on the POEM website www.portlandonline.com/oem and will be available there during update cycles. This website also contains an email address and phone number that the public can use if they have comments or concerns.

The number one priority of the 2010 plan is to continue to involve the public in updating the Natural Hazard Mitigation Plan. The first order of business after the update is approved by federal, state and City management will be to convene a meeting of the Hazard Mitigation Planning Team(HMPT) to review an annual calendar of events and opportunities for collaboration on mitigation outreach and education. Utilizing the Public Involvement Advisory Council 09 Principles as a guide, the HMPT will establish a schedule to implement this action item. In addition a citizen mitigation action plan will be created. As a part of this process, community members will prioritize the list of actions that they can implement or promote.

