Agenda
City of Portland Natural Hazard Mitigation Plan Update
8th Steering Committee Meeting
Wednesday, March 16, 2016, 4:00 to 8:00 PM
Wy'East Conference Room, Level L1, 501 N Dixon St., Portland, OR 97227
Call in Number: 800-523-8437 Code: 707-186-3750

4:00pm – 4:20pm Jeremy O'Leary, *Chairperson,* Danielle Butsick and Kristen Gelino, *Planning Team* **Handout** – SC#7 Summary	**WELCOME AND INTRODUCTIONS** • Round-table introductions • Establish quorum • Review the agenda • Public comment • Review the action items and approve February meeting summary • Administrative updates • Review of meeting tools
4:20pm – 4:50pm Desiree Williams-Rajee, *Guest Speaker from Bureau of Planning and Sustainability* and Danielle Butsick, *Planning Team*	**CLIMATE ACTION PLAN EQUITY IMPLEMENTATION GUIDE** • Present considerations and lessons learned for mitigation planning • Set the stage for discussion about issues and action items Why this matters: The Climate Action Plan working group has some valuable lessons learned and recommendations to share with the hazard mitigation plan steering committee. Feedback requested: Questions for Desiree on the information she is presenting. Thoughts and comments on how this information relates to the hazard mitigation plan. Example: "Can you explain a bit more about how this recommendation came about?" or, "I see a parallel between this recommendation and action item development in the hazard mitigation plan."
4:50pm – 5:25pm Jeremy O'Leary, *Chairperson,* Danielle Butsick and Kristen Gelino, *Planning Team* **Handout #1** – Working Issues Statements; **Handout #2** – Social Vulnerability and Critical Facility Summary Tables; **Handout #3** – Working Mitigation Best Practices Catalog; **Handout #4** – Action-storming Instructions	**ISSUES AND CAPABILITIES DISCUSSION AND BREAK OUT GROUP INSTRUCTIONS** • Reflect on issues and discuss capabilities that we have and those that we wish we had • Review mitigation best practices catalog • Provide instructions for the break-out groups Why this matters: The issues help us focus on mitigation-related problems for which we want to develop solutions. Capabilities we have should be used to help us in our mitigation efforts. We should identify ways to acquire or increase capabilities that we wish we had. Feedback requested: A capability that you are aware of that could be utilized to assist in mitigation projects or one that you wish was available. Anything that is confusing about issues, an issue you identified but is not listed, anything you are concerned or curious about. Example: "The City has robust data on its general building stock, but we wish we had a method to track those structures that have been retrofitted" or, "Why aren't individual critical facility results presented?"
5:25pm – 5:40pm	**BREAK**
5:40pm – 6:25pm Break out groups **Action-storming Packets**	**SMALL GROUP ACTION-STORMING** • Start with 10 minutes of individual brainstorming • Develop suggested action items Why this matters: This process will result in recommendations for mitigation action items that will be included and highlighted in the mitigation best practices catalog.

Feedback requested: Suggested action items and possible performance metrics and/or partners.

> **Example:** "Retro-fit unreinforced masonry schools", or "develop a sustained source of funding for private mitigation grants".

6:25pm – 6:35pm	**BREAK**
6:35pm – 7:05pm Break out groups **Action-storming Packets**	**SMALL GROUP ACTION-STORMING** • Continue development of suggested action items
7:05pm – 7:15pm	**BREAK**
7:15pm – 7:45pm Break out groups **Action-storming Packets**	**SMALL GROUP ACTION-STORMING** • Continue development of suggested action items
7:45pm – 8:00pm Jeremy O'Leary, *Chairperson,* Danielle Butsick and Kristen Gelino, *Planning Team*	**PUBLIC COMMENT AND NEXT STEPS** • Public comment • Planning process update • Review action items identified in the meeting
8:00pm	**ADJOURN**

Handout #1: Working Issues Statements

GENERAL ISSUES RELATED TO SOCIAL VULNERABILITY

Important Note: *An individual's demographic characteristics (e.g. race, income etc.) per se do not cause a person to be more vulnerable to natural hazard events. Nothing is inherent in a person's demographic characteristics that precludes them form preparing for or responding to an emergency situation. The ability to avoid, withstand, cope with, respond to and recover from a disaster is an outcome of a host of internal and external characteristics often shaped by circumstances beyond an individual's control. Therefore, no group should be viewed as a so-called victim group or a so-called rescue group. Social vulnerability assessment is merely a way of identifying spatial distribution of groups that are likely to suffer disproportionately in case of a hazard event, as a result of non-supportive mitigation and capacity building policies.*

- **Children, especially in the youngest age groups,** often cannot protect themselves during a disaster because they lack the necessary resources, knowledge, or life experiences to effectively cope with the situation. Hazard mitigation planning activities need to be tailored to ensure that the community is better prepared to ensure that children are safe during disaster events. ***Children under 15 years of age comprise 16 percent of total city population.***

- **Persons aged 65 years and older** are likely to require financial support, transportation, medical care, or assistance with ordinary daily activities during disasters. As such hazard mitigation activities need to plan beforehand for such demands. ***Persons age 65 or over comprise 11.2 percent of the total city population.***

- **People that rent** predominantly do so because they are either transient or do not have the financial resources for home ownership. They often lack access to information about financial aid during recovery. In the most extreme cases, renters lack sufficient shelter options when lodging becomes uninhabitable or too costly to afford. Renters commonly have limited opportunities for implementing mitigation measures at their home. Additionally, renters may not receive information regarding hazard risks at the property. ***Persons residing in rented homes comprise 45.2 percent of the total city population.***

- **Social and economic marginalization of certain ethnic racial and ethnic groups in our society**, including real estate discrimination, has resulted in greater vulnerability of these households to all types of disasters. Based on data from a number of disaster studies, African Americans, Native Americans; and populations of Asian, Pacific Islander, or Hispanic origin are likely to be relatively more vulnerable. These households often have limited knowledge of local risks, modes of risk communication, limited capacity to respond, and are likely to face major hurdles in navigating the local bureaucratic procedures to receive aid and assistance in a disaster event. ***Non-white populations comprise 22.4 percent of the total city population.***

- **Economically disadvantaged families** have very limited ability to absorb losses due to hazard impacts. Wealth enables families to absorb and recover from losses more quickly due to insurance, social safety nets, and entitlement programs. At the same time, poorer families are likely to inhabit

TETRA TECH

poor quality housing and reside in locations that are most vulnerable to hazard events. Economically disadvantaged neighborhoods are also likely to have relatively poor infrastructure and facilities, which exacerbate the disaster consequences for such families. ***Families with incomes below the poverty line comprise 11.7 percent of the total families in the city.***

- Many **households**, specifically immigrants, are **not fluent in English**. To the degree that population has limited English proficiency, disaster communication is made increasingly difficult. This difficulty is especially true in communities whose first language is neither English nor Spanish and for whom translators and accurate translations of advisories may be scarce. Such households are likely to rely on relatives and local social networks (i.e., friends and neighbors) for information for preparing for a disaster event. ***Households with limited English speaking capabilities comprise 4.3 percent of the total households in the city.***

- **Persons with disabilities or others with access and functional needs** are more likely to have difficulty responding to a hazard event than the general population. Family, neighbors and local government are the first level of response to assist these individuals, and coordination of efforts to meet their access and functional needs is paramount to life safety efforts. It is important for emergency managers to distinguish between functional and medical needs in order to plan for incidents that require evacuation and sheltering. Knowing the percentage of population with a disability allows emergency management personnel and first responders to have personnel available who can provide services needed by those with access and functional needs. ***Persons under 65 years of age with a disability comprise 8.5 percent of the total population in the City.***

Additional factors that may increase vulnerability to hazard events include: employment status, level of education, single-parent headed households, housing tenure and structure (e.g. group quarters), and social isolation.

DAM FAILURE
- **The following issues have been identified based on the Mt Tabor Reservoir 1 inundation scenario:**
    - Immediate impacts will be contained within the Southeast Uplift Neighborhood Program risk reporting area.
    - More than 2,100 people are estimated to reside within the inundation areas. Of these, it is estimated that 924 people will be displaced from their homes after an event and 754 of these people will seek shelter in public shelters.
    - Of the 739 buildings exposed, 572 are expected to be impacted by a dam failure event resulting in more than $95.4 million in damages. This is less than 1 percent of the total value of the Southeast Uplift Neighborhood Program and less than 0.1 percent of the total value of the planning area.
    - The structures exposed to the hazard are predominantly residential (97 percent); however, there are also 9 structures identified as educational occupancy, 12 commercial structures and 1 religious structure in the exposure area.
    - More than 12,120 tons of debris would be expected from the inundation event, which will require approximately 485 truckloads to remove.
    - Only 1 building in the inundation area is believed to have flood insurance.
    - There are 2 critical facilities located in the inundation area.

- **The following issues have been identified based on the Mt Tabor Reservoir 5 and 6 inundation scenario:**
  - Immediate impacts will be contained within the Central City and Southeast Uplift Neighborhood Program risk reporting area. The vast majority of exposure is in the Southeast Uplift Neighborhood Program (96 percent of inundation area).
  - 12,477 people are estimated to reside within the inundation areas.
  - There are 4,300 buildings estimated to be exposed to the dam inundation area.
  - The vast majority of exposed structures in the Southeast Uplift Neighborhood Program reporting area are residential (95 percent).
  - More than 59,741 tons of debris would be expected from the inundation event, which will require approximately 2,390 truckloads to remove.
  - Note: due to a bug in Hazus, vulnerability estimates are pending.
  - Only 9 buildings in the inundation area are believed to have flood insurance.
  - There are 14 critical facilities located in the inundation area.
- **The following issues have been identified based on the Washington Park reservoirs 3 and 4 inundation scenario:**
  - Immediate impacts will be contained predominantly within the Central City and the Neighbors West/Northwest risk reporting area. There is one government building exposed in the Southwest Neighborhoods, Inc. area.
  - 621 people are estimated to reside within the inundation areas. Of these, it is estimated that 285 people will be displaced from their homes after an event and 275 of these people will seek shelter in public shelters.
  - It is estimated that over 90 percent of the population exposed to the dam failure hazard reside in renter occupied housing and that more than 27 percent of families in the hazard area have incomes below the poverty level.
  - Of the 52 buildings exposed, 44 are expected to be impacted by a dam failure event resulting in more than $66 million in damages. This is less than 1 percent of the total value of the risk reporting areas impacted and less than 0.1 percent of the total value of the planning area.
  - All structures exposed within the Neighbors West/Northwest area are commercial structures. Structures exposed in the Central City are mixed: 14 residential, 21 commercial, 5 industrial.
  - More than 4,056 tons of debris would be expected from the inundation event, which will require approximately 162 truckloads to remove. Most debris will be in the Central City.
  - No buildings in the inundation areas are believed to have flood insurance.
  - There are 3 critical facilities located in the inundation area.

- It is unclear whether dam failure warning and notification strategies will be viable if dam failure occurs as a result of a significant earthquake that interrupts communication systems.
- Downstream populations are often not aware that they are located in a dam failure inundation area and do not know the risks associated with probable dam failure.
- Balancing the need to address security concerns and the need to inform the public of the risk associated with dam failure is a challenge for public officials.

DROUGHT
- There are no quantitative estimates for general building stock impacts for the drought hazard.

- Water resource management strategies have changed significantly over the last several decades. Managers must now consider the needs of communities, industries, power-generating facilities and the environment. Issues associated with meeting the needs of these competing demands with limited resources will likely increase as population growth continues and the impacts of climate change intensify.
- The use and promotion of water-saving and reclamation technologies even during non-drought periods may decrease the effects of drought in the planning area.
- Predicting droughts can be challenging, although warning systems are currently under development.

EARTHQUAKE

- It is estimated that 76 percent of buildings (149,021) in the planning area were built before 1974 when the first provisions for seismic criteria were implemented. (Note: Some buildings have been retrofitted, but data is not available to estimate the number and types of retrofits).
- It is estimated that an additional 10.5 percent of buildings (20,534) in the planning area were built between 1974 and 1993 before modern seismic codes were in place.
- There are estimated to be 13,191 buildings located in high liquefaction susceptibility areas. This is about 7 percent of all buildings in the planning area. 36 percent of these buildings (4,774) are located in the Southeast Uplift Neighborhood Program and 28 percent (3,777) are located in North Portland Neighborhood Services. An additional 6,090 buildings are located in moderate liquefaction susceptibility areas.
- **The following social vulnerability related issues have been identified for high liquefaction potential areas:**
    - The percent of the population over 65 years of age greater than a percent or two above the city-wide average are found in the North Portland Neighborhood Services area (18 percent), Southwest Neighborhoods Inc. (17 percent), and East Portland Neighborhood Office (15 percent).
    - Non-white populations greater than a percent or two above the city-wide population are found in Central Northeast Neighborhoods (32 percent), Airport (32 percent), North Portland Neighborhood Services (29 percent) and East Portland Neighborhood Office (26 percent).
    - Renter occupied housing rates greater than a percent or two above the city-wide rates are found in the Central City (82 percent), Airport (69 percent), Central Northeast Neighborhoods (67 percent), Southeast Uplift Neighborhood Program (58 percent) and Southwest Neighborhoods, Inc. (54 percent).
    - Families with incomes below the poverty level greater than a percent or two above the city-wide average include Airport (20 percent), Central Northeast Neighborhoods (19 percent), and Central City (14 percent).
    - Households with limited English speaking abilities greater than a percent or two above city-wide averages include Airport (21 percent) and Central Northeast Neighborhoods (20 percent).
- **The following issues have been identified based on the 100-year probabilistic earthquake scenario:**
    - All risk reporting would experience damage.
    - It is estimated that 513 households will be displaced from their homes after an event and 243 of these people will seek shelter in public shelters. More than half of these people are expected to reside in the Central City.

- More than 317,000 tons of debris would be expected from the event, which will require approximately 12,680 truckloads to remove. Most debris (more than 30,000 tons) will be in the Central City, North Portland Neighborhood Services area, Southeast Uplift Neighborhood Program area, and Neighbors West/Northwest.
  - All risk reporting areas have estimated damages of less than 1 percent of the total value and about 0.5 percent of the total value of the planning area would likely be damaged.
  - It is expected that 346 buildings in the planning area will be extensively or completely damaged. An additional 2,197 would be expected to be moderately damaged.
- **The following issues have been identified based on the Cascadia M9.0 event earthquake scenario:**
  - All risk reporting would experience damage.
  - It is estimated that 5,838 households will be displaced from their homes after an event and 2,893 of these people will seek shelter in public shelters. About half of these people are expected to reside in the Central City.
  - More than 3.7 million tons of debris would be expected from the event, which will require approximately 148,000 truckloads to remove. Most debris (more than 500,000 tons) will be in the Central City, Neighbors West/Northwest, Southwest Neighborhoods, Inc., and Southeast Uplift Neighborhood Program area.
  - All risk reporting areas have estimated damaged of more than 2 percent of the total value. The following risk reporting areas are expected to have damages of more than 8 percent of the total value: North Portland Neighborhood Services, Neighbors West/Northwest and Airport. About 4.3 percent of the total value of the planning area would likely be damaged.
  - It is expected that 5,587 buildings in the planning area will be extensively or completely damaged. An additional 8,309 would be expected to be moderately damaged.
- **The following issues have been identified based on the 500-year probabilistic earthquake scenario:**
  - All risk reporting would experience damage.
  - It is estimated that 19,726 households will be displaced from their homes after an event and 9,674 of these people will seek shelter in public shelters. About half of these people are expected to reside in the Central City. Additionally, more than 1,200 people in the Neighbors West/ Northwest and Southeast Uplift Neighborhood program may require shelter.
  - More than 8.4 million tons of debris would be expected from the event, which will require approximately 338,000 truckloads to remove. More than half of this debris will be in the Central City and North Portland Neighborhood Services reporting areas.
  - All risk reporting areas have estimated damaged of more than 4 percent of the total value. The following risk reporting areas are expected to have damages of more than 10 percent of their total value: Central City, Neighbors West/Northwest, Southwest Neighborhoods Inc., and Northeast Coalition. About 12.9 percent of the total value of the planning area would likely be damaged. About one third of this damage would come from the Central City alone.
  - It is expected that 12,871 buildings in the planning area will be extensively or completely damaged. An additional 24,868 would be expected to be moderately damaged.
- **The following issues have been identified based on the Portland Hills M6.5 event earthquake scenario:**
  - All risk reporting would experience damage.

- It is estimated that 25,186 households will be displaced from their homes after an event and 12,437 of these people will seek shelter in public shelters. More than half of these people are expected to reside in the Central City. Additionally, more than 1,000 people in the Neighbors West/ Northwest and Southeast Uplift Neighborhood program may require shelter.
- More than 9.5 million tons of debris would be expected from the event, which will require approximately 380,400 truckloads to remove. More than 75 percent of this debris will be in the Central City and North Portland Neighborhood Services, and Neighbors West/Northwest reporting areas.
- All risk reporting areas have estimated damaged of more than 5 percent of the total value. The following risk reporting areas are expected to have damages of more than 10 percent of their total value: Central City, Neighbors West/Northwest, North Portland Neighborhood Services and Northeast Coalition. The Central City and Neighbors West/Northwest would be expected to have damages in excess of 25 percent of the total value of the areas. About 14 percent of the total value of the planning area would likely be damaged.
- It is expected that 12,948 buildings in the planning area will be extensively or completely damaged. An additional 27,834 would be expected to be moderately damaged.

- Critical facility owners should be encouraged to create or enhance continuity of operations plans using the information on risk and vulnerability developed for this plan.
- Earthquakes could trigger other natural hazard events such as dam failures, levee failures and landslides, which could severely impact the planning area or regional critical facilities.
- There may be additional faults in or around the City of Portland that have not yet been discovered.
- After a major seismic event, the City of Portland is likely to experience disruptions in the flow of goods and services due to the destruction of major transportation infrastructure across the broader region.
- In many outreach programs residents are instructed to be self-sufficient up to three days following a major earthquake without government response agencies, utilities, private sector services and infrastructure components. It is likely that after a major event, supplies for 72 hours would not be sufficient.
- Natural hazards have a devastating impact on businesses. Of all businesses that close following a disaster, more than 43 percent never reopen, and an additional 29 percent close for good within the next two years. The Institute of Business and Home Safety has developed "Open for Business," which is a disaster planning toolkit to help guide businesses in preparing for and dealing with the adverse effects of natural hazards. The kit integrates protection from natural disasters into companies' risk reduction measures to safeguard employees, customers, and the investment itself. The guide helps businesses secure human and physical resources during disasters, and helps to develop strategies to maintain business continuity before, during, and after a disaster occurs.
- An early warning system, ShakeAlert, is currently under development, but is not ready for public use.

FLOOD

- Not all structures located within the 1 percent annual chance flood hazard area have flood insurance. Flood insurance uptake is estimated to be 50 percent or less all risk reporting hazard

aside from the Northeast Coalition where there is no mapped flood risk and the Central City where there is 60 percent uptake in flood insurance.

- Only about 18 percent of structures located in the 0.2 percent annual chance flood hazard area are thought to have flood insurance.
- There are a significant number of Pre-FIRM buildings in the planning area. Approximately 75 percent of the buildings in the 1 percent annual chance flood hazard area are believed to have been built before 1981.
- Approximately 93 percent of the buildings in the floodplain were built before freeboard requirements were in place (1996).
- There are 9 repetitive loss properties that have structures on them in the planning area. Of these, 7 are located in the 1 percent annual chance flood hazard area, 1 is located in very close proximity to the special flood hazard area and 1 is located in the 0.2 percent annual chance flood hazard area.
- **The following issues have been identified based on the 10 percent annual chance (10-year) flood scenario:**
    - Immediate impacts will be felt within all risk reporting areas except for the Northeast Coalition. However, the Central City and Neighbors West/Northwest are expected to be most severely impacted.
    - It is estimated that 4,052 people will be displaced from their homes after an event and 3,458 of these people will seek shelter in public shelters.
    - 82 buildings are expected to be impacted by the flood event resulting in more than $182.3 million in damages. This is less than 1 percent of the total value of the risk reporting areas impacted and just about 0.1 percent of the total value of the planning area.
    - More than 16,255 tons of debris would be expected from the flood event, which will require approximately 650 truckloads to remove. Most debris will be in the North Portland Neighborhood Services area, Southeast Uplift Neighborhood Program area and the Central City.
    - There are 20 critical facilities located in the flood hazard area.
- **The following issues have been identified based on the 1 percent annual chance (100-year) flood scenario:**
    - Immediate impacts will be felt within all risk reporting areas except for the Northeast Coalition. The risk reporting areas with the greatest number of buildings impacted (more than 100) will include North Portland Neighborhood Services, East Portland Neighborhood Office, Airport and Southeast Uplift neighborhood Program.
    - It is estimated that 4,499 people will be displaced from their homes after an event and 3,664 of these people will seek shelter in public shelters.
    - Of the 2,925 buildings exposed, 2,138 buildings are expected to be impacted by the flood event resulting in more than $418.5 million in damages. This is less than 1 percent of the total value of the risk reporting areas impacted and just about 0.25 percent of the total value of the planning area.
    - More than 39,639 tons of debris would be expected from the flood event, which will require approximately 1,585 truckloads to remove. Most debris (more than 5,000 tons) will be in the North Portland Neighborhood Services area, Southeast Uplift Neighborhood Program area, the Central City and the East Portland Neighborhood office.
    - The percent of the population under 15 years of age of age greater than a percent or two above the city-wide average are found in the East Portland Neighborhood Office area (17 percent).

- – The percent of the population over 65 years of age greater than a percent or two above the city-wide average are found in the North Portland Neighborhood Services (21 percent), Southwest Neighborhoods, Inc. (17 percent), Southeast Uplift Neighborhood Program (17 percent) and East Portland Neighborhood Office (14 percent).
  - – Non-white populations greater than a percent or two above the city-wide population are found in Airport (32 percent) and Central Northeast Neighborhoods (32 percent).
  - – Renter occupied housing rates greater than a percent or two above the city-wide rates are found in the Central City (80 percent), Airport (69 percent), Central Northeast Neighborhoods (69 percent), and Southwest Neighborhoods, Inc. (60 percent).
  - – Families with incomes below the poverty level greater than a percent or two above the city-wide average include Airport (20 percent) and Central Northeast Neighborhoods (20 percent)
  - – Households with limited English speaking abilities greater than a percent or two above city-wide averages are found in Airport (21 percent) and Central Northeast Neighborhoods (20 percent).
  - – There are 80 critical facilities located in the flood hazard area.
- **The following issues have been identified based on the 0.2 percent annual chance (500-year) flood scenario:**
  - – Immediate impacts will be felt within all risk reporting areas except for the Northeast Coalition. The risk reporting areas with the greatest number of buildings impacted will include North Portland Neighborhood Services (1,567 buildings), East Portland Neighborhood Office (1,456 buildings), and Central City (573 buildings).
  - – It is estimated that 11,709 people will be displaced from their homes after an event and 10,622 of these people will seek shelter in public shelters.
  - – Of the 4,536 buildings exposed, 2,261 buildings are expected to be impacted by the flood event resulting in more than $1.9 billion in damages. This is more than 3.4 percent of the total value of the North Portland Neighborhood Services and more than 2.5 percent of the total value of the Central City risk reporting areas. In total damages would account for about 1.1 percent of the total value of the planning area.
  - – More than 65,307 tons of debris would be expected from the flood event, which will require approximately 2,612 truckloads to remove. Most debris (more than 15,000 tons) will be in the Central City, North Portland Neighborhood Services area, and Southeast Uplift Neighborhood Program area
  - – The percent of the population under 15 years of age of age greater than a percent or two above the city-wide average are found in the East Portland Neighborhood Office area (19 percent).
  - – The percent of the population over 65 years of age greater than a percent or two above the city-wide average are found in the North Portland Neighborhood Services (21 percent), Southwest Neighborhoods, Inc. (18 percent) and Southeast Uplift Neighborhood Program (16 percent).
  - – Non-white populations greater than a percent or two above the city-wide population are found in Airport (32 percent) and Central Northeast Neighborhoods (32 percent).
  - – Renter occupied housing rates greater than a percent or two above the city-wide rates are found in the Central City (77 percent), Airport (69 percent), Central Northeast Neighborhoods (69 percent), and Southwest Neighborhoods, Inc. (59 percent).

- Families with incomes below the poverty level greater than a percent or two above the city-wide average include Airport (20 percent) and Central Northeast Neighborhoods (20 percent)
- Households with limited English speaking abilities greater than a percent or two above city-wide averages are found in Airport (21 percent) and Central Northeast Neighborhoods (21 percent).
- There are 185 critical facilities located in the flood hazard area.

- A sustained effort should be made to gather historical damage data, such as high water marks on structures and damages reports. The collection of this information will assist with determining the cost-effectiveness of future mitigation projects and will provide more information on the nature of the hazard.
- Flood hazards do not recognize jurisdictional boundaries, and actions in jurisdictions can impact upstream or downstream neighbors. Coordination is necessary to ensure that these connections are understood and hazards are effectively mitigated.
- Floodplain residents need to continue to be educated about flood preparedness and the resources available during and after floods. Flood preparedness can help residents reduce risk to property and lives. Resources that are made available after flood events can help residents make informed decisions that may mitigate future risk to lives and property.
- The risk associated with the flood hazard overlaps the risk associated with other hazards, such as earthquake and landslide. This provides an opportunity to seek mitigation alternatives that can reduce risk for multiple hazards.
- The location of hazardous materials within the floodplain could result in secondary hazards during or after a flood event.
- FEMA maps do not recognize residual risk outside the mapped area. Where levees are accredited, there may be a misperception that there is no flood risk. Public outreach and awareness efforts should, therefore, emphasize the residual risk behind levees.
- The impacts of climate change on flood impacts in the planning area are uncertain.
- Existing floodplain-compatible uses such as agricultural and open space need to be maintained.

LANDSLIDE

- All risk reporting areas aside from the Airport have landslide exposure.
- It is estimated that more than 89,000 people reside in landslide hazard areas. More than half of this exposure is in the Southwest Neighborhoods Inc. reporting area and an additional 25 percent is in the Neighbors West/Northwest risk reporting area. 82 percent and 77 percent of the total population in these areas are believed to be exposed to some extent to the landslide hazard.
- More than 26,370 buildings are estimated to be exposed to the landslide hazard. The risk reporting areas with more than 1,000 buildings exposed include Southwest Neighborhoods Inc., Neighbors West/Northwest, and East Portland Neighborhood Office. More than 70 percent of the buildings exposed are in the Southwest Neighborhoods Inc. area.
- The total value of exposed contents and structures in the planning area is estimated to be more than $20.6 billion or 12.1 percent of the total value of the planning area. About 68 percent of this exposure is in the Southwest Neighborhoods Inc. area.
- The vast majority of buildings exposed are residential (96 percent, 25,341). There are also 742 commercial buildings exposed, 64 government buildings, 62 religious services buildings, and 61 industrial buildings.

- The percent of the population under 15 years of age of age greater than a percent or two above the city-wide average are found in the East Portland Neighborhood Office area (22 percent).
- The percent of the population over 65 years of age greater than a percent or two above the city-wide average are found in Central Northeast Neighborhoods (24 percent), Northeast Coalition (21 percent), Southeast Uplift Neighborhood Program (18 percent), and Central City (14 percent).
- Non-white populations greater than a percent or two above the city-wide population are found in East Portland Neighborhood Office (26 percent).
- Renter occupied housing rates greater than a percent or two above the city-wide rates are found in the Central City (75 percent) and Northeast Coalition (75 percent).
- Households with limited English speaking abilities greater than a percent or two above city-wide averages are found in Central Northeast Neighborhoods (8 percent) and East Portland Neighborhood Office (7 percent).
- There are 192 critical facilities located in the landslide hazard area.

- Mapping and assessment of landslide hazards are constantly evolving. As new data and science become available, assessments of landslide risk should be reevaluated. This is especially true for runout modelling, which is not currently well understood.
- The impact of climate change on landslides is uncertain. Climate change impacts that alter vegetation patterns, increase the occurrence of wildfires or alter precipitation patterns may increase exposure to landslide risks.
- Landslides may cause negative environmental consequences, including water quality degradation.
- Areas with significant landslide risk should be monitored, to the extent possible, immediately following a possible triggering event.
- Facilities that contain hazardous materials located in landslide hazard areas may present additional risks for the planning area.
- Currently available maps do not indicate run-out (where a landslide might go). Current maps show the area that might be unstable, but do not offer a complete picture of areas at risk. New mapping is currently being developed by DOGAMI.

SEVERE WEATHER

- Applicable dates for wind and snow load requirements have been secured and the planning team is working on calculating the structure estimates. Older building stock (see earthquake date of construction information) will be more vulnerable to these hazards.

- Redundancy of power supply throughout the planning area must be evaluated to better understand what areas may be vulnerable.
- The capacity for backup power generation is limited in critical facilities throughout the planning area.
- Debris management (downed trees, etc.) must be addressed, because debris can impact the severity of severe weather events, requires coordination efforts, and may require additional funding. A debris management plan is currently being developed.
- The effects of climate change may result in an increase in frequency of extreme heat events or more frequent, stronger storm systems.
- Older building stock in the planning area is built to low code standards or none at all. These structures could be highly vulnerable to severe winter weather effects such as snow loads or high winds.
- Urban forest management programs should be evaluated to help reduce impacts from forest-related damages.

VOLCANIC HAZARDS

- The entire planning area may be exposed to an ashfall event.
- The East Portland Neighborhood Office risk reporting area is exposed to distal hazards from a large magnitude event at Mount Hood.
- 25 people are estimated to reside in areas that may be impacted by distal hazards.
- 43 buildings at an estimated replacement value of $480 million are exposed to the hazard. This represents about 1.9 percent of the risk reporting area and less than 1 percent of the total value of the planning area.
- Buildings exposed are predominately commercial (24). There are also 7 residential, 7 industrial, and 5 educational buildings exposed.
- The percent of the population over 65 years of age greater than a percent or two above the city-wide average are found in East Portland Neighborhood Office (24 percent).
- There are 42 critical facilities located in the volcano hazard area.

- Ash fall from volcanic eruptions can cause significant damage to heating and air conditioning systems and combustion systems.
- Ash fall increases in weight significantly when wet and cleanup efforts can be extremely challenging.

WILDFIRE

- Wildfire hazard areas have been identified in all risk reporting areas aside from the following: Airport, Northeast Coalition and Southeast Uplift Neighborhood Program.
- 68,015 people are estimated to reside in wildfire hazard areas. This includes approximately 75 percent of the Neighbors West/ Northwest population and nearly 45 percent of the Southwest Neighborhoods Inc. population.
- There are estimated to be 19,236 buildings exposed to the wildfire hazard. More than half of these are in the Southwest Neighborhoods Inc. reporting area. The majority of the remaining structures are in the Neighbors West/Northwest and East Portland Neighborhood Office reporting areas.
- More than $16.2 billion is estimated to be exposed to the wildfire hazard. This is approximately 9.4 percent of the total value of the planning area, more than 55 percent of the Southwest Neighborhoods Inc. risk reporting area and almost 25 percent of the Neighbors West/ Northwest area.
- More than 96 percent of the exposed buildings are thought to be residential structures. About 2 percent of the remaining buildings are commercial.
- The percent of the population under 15 years of age of age greater than a percent or two above the city-wide average are found in the East Portland Neighborhood Office area (23 percent).
- The percent of the population over 65 years of age greater than a percent or two above the city-wide average are found in Central Northeast Neighborhoods (29 percent) and Neighbors West/Northwest (14 percent).
- Non-white populations greater than a percent or two above the city-wide population are found in Central Northeast Neighborhoods (26 percent) and East Portland Neighborhood Office (26 percent).
- Renter occupied housing rates greater than a percent or two above the city-wide rates are found in the Central City (62 percent).
- Families with incomes below the poverty level greater than a percent or two above the city-wide average include Central Northeast Neighborhoods (16 percent)

- Households with limited English speaking abilities greater than a percent or two above city-wide averages are found in Central Northeast Neighborhoods (10 percent) and East Portland Neighborhood Office (7 percent).
- There are 154 critical facilities located in the landslide hazard area.

Note: Please see Handout #2 for social vulnerability and critical facility exposure estimates.

Handout #2: Additional Loss Estimate Results

Social Vulnerability Estimates

Please note that these estimates were made using the best available data (American Community Survey estimates), which does not correspond with hazard risk areas. It is expected that there is a degree of over- or under-estimation in these estimates, but they are adequate for planning purposes. Shaded fields indicate that values are at least 2 percent higher than Portland-wide averages (see below):

- Percent under 15 years of age – 16.2 percent
- Percent over 65 years of age - 11.2 percent
- Percent non-white population – 22.4 percent
- Percent of renter occupied housing – 45.7 percent
- Percent of families below the poverty level – 11.7 percent
- Percent of limited English-speaking households – 4.3 percent

Note: If risk reporting areas are not included, then it can be assumed that there is no known exposure.

Dam Failure

Mt Tabor Reservoir 1 inundation scenario

Risk Reporting Area	Percent Under 15 Years	Percent Over 65 Years	Percent of Non-White Population	Percent of Renter occupied Housing	Percent of Families Below Poverty Level	Percent of Limited English Speaking Households
Southeast Uplift Neighborhood Program	11.6%	9.4%	12.5%	45.4%	10.3%	5.6%

TETRA TECH

Mt Tabor Reservoir 5 and 6 inundation scenario

Risk Reporting Area	Percent Under 15 Years	Percent Over 65 Years	Percent of Non-White Population	Percent of Renter occupied Housing	Percent of Families Below Poverty Level	Percent of Limited English Speaking Households
Southeast Uplift Neighborhood Program	15.4%	9.0%	12.5%	37.5%	6.5%	2.5%

Washington Park reservoirs 3 and 4 inundation scenario

Risk Reporting Area	Percent Under 15 Years	Percent Over 65 Years	Percent of Non-White Population	Percent of Renter occupied Housing	Percent of Families Below Poverty Level	Percent of Limited English Speaking Households
Central City	2.1%	4.6%	19.3%	90.3%	27.1%	1.7%

Flood

1 percent annual chance (100-year flood)

Risk Reporting Area	Percent Under 15 Years	Percent Over 65 Years	Percent of Non-White Population	Percent of Renter occupied Housing	Percent of Families Below Poverty Level	Percent of Limited English Speaking Households
Airport	5.4%	5.1%	31.8%	68.8%	19.8%	20.6%
Central City	2.9%	9.7%	13.4%	79.4%	10.5%	0.7%
Central Northeast Neighborhoods	5.4%	5.1%	31.8%	68.8%	19.8%	20.6%
East Portland Neighborhood Office	17.0%	14.0%	22.1%	26.9%	9.4%	4.1%
Neighbors West/Northwest	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
North Portland Neighborhood Services	12.2%	21.1%	23.0%	20.3%	7.2%	3.2%
Northeast Coalition	-	-	-	-	-	-
Southeast Uplift Neighborhood Program	10.7%	16.6%	8.1%	41.4%	2.3%	3.1%
Southwest Neighborhoods, Inc.	9.8%	17.2%	17.2%	60.1%	8.2%	1.3%
Total	**13.7%**	**14.8%**	**21.9%**	**33.2%**	**8.8%**	**3.8%**

0.2 percent annual chance (500-year flood)

Risk Reporting Area	Percent Under 15 Years	Percent Over 65 Years	Percent of Non-White Population	Percent of Renter occupied Housing	Percent of Families Below Poverty Level	Percent of Limited English Speaking Households
Airport	5.4%	5.1%	31.8%	68.8%	19.8%	20.6%
Central City	1.5%	9.3%	13.5%	77.2%	10.1%	1.3%
Central Northeast Neighborhoods	5.4%	5.1%	31.8%	68.8%	19.8%	20.6%
East Portland Neighborhood Office	18.6%	13.1%	22.9%	30.3%	11.7%	5.1%
Neighbors West/Northwest	-	-	-	-	-	-
North Portland Neighborhood Services	12.2%	21.1%	22.8%	20.1%	7.2%	3.2%
Northeast Coalition	-	-	-	-	-	-
Southeast Uplift Neighborhood Program	11.2%	16.2%	8.3%	41.5%	2.2%	3.3%
Southwest Neighborhoods, Inc.	8.7%	17.6%	16.3%	59.2%	6.1%	1.5%
Total	**11.4%**	**13.0%**	**19.8%**	**51.2%**	**10.2%**	**3.2%**

Earthquake (High Liquefaction Potential Areas)

Risk Reporting Area	Percent Under 15 Years	Percent Over 65 Years	Percent of Non-White Population	Percent of Renter occupied Housing	Percent of Families Below Poverty Level	Percent of Limited English Speaking Households
Airport	5.4%	5.1%	31.8%	68.8%	19.8%	20.6%
Central City	2.6%	7.8%	12.9%	82.4%	13.8%	0.5%
Central Northeast Neighborhoods	5.6%	5.2%	32.0%	66.5%	18.9%	19.7%
East Portland Neighborhood Office	17.6%	14.8%	26.3%	24.9%	10.7%	5.2%
Neighbors West/Northwest	13.6%	13.3%	11.6%	22.3%	1.4%	0.0%
North Portland Neighborhood Services	14.4%	17.7%	29.2%	22.1%	8.0%	3.8%
Northeast Coalition	-	-	-	-	-	-

Risk Reporting Area	Percent Under 15 Years	Percent Over 65 Years	Percent of Non-White Population	Percent of Renter occupied Housing	Percent of Families Below Poverty Level	Percent of Limited English Speaking Households
Southeast Uplift Neighborhood Program	13.6%	12.0%	12.7%	58.4%	7.3%	2.2%
Southwest Neighborhoods, Inc.	12.1%	16.6%	13.8%	54.1%	4.9%	1.4%
Total	**13.1%**	**13.8%**	**17.5%**	**50.4%**	**7.6%**	**2.5%**

Landslide

Risk Reporting Area	Percent Under 15 Years	Percent Over 65 Years	Percent of Non-White Population	Percent of Renter occupied Housing	Percent of Families Below Poverty Level	Percent of Limited English Speaking Households
Central City	4.8%	13.5%	16.0%	75.0%	6.0%	0.3%
Central Northeast Neighborhoods	11.4%	24.0%	21.8%	37.8%	13.1%	8.3%
East Portland Neighborhood Office	22.3%	11.4%	25.8%	22.5%	7.1%	7.2%
Neighbors West/Northwest	14.4%	13.4%	16.9%	33.8%	3.5%	1.2%
North Portland Neighborhood Services	12.8%	8.8%	17.4%	38.8%	9.5%	1.6%
Northeast Coalition	7.0%	21.2%	16.5%	68.3%	2.9%	0.1%
Southeast Uplift Neighborhood Program	12.0%	18.4%	12.2%	29.8%	3.7%	1.9%
Southwest Neighborhoods, Inc.	15.1%	13.1%	12.5%	35.5%	5.1%	1.3%
Total	15.0%	13.2%	14.4%	35.4%	4.8%	1.5%

Volcano

Risk Reporting Area	Percent Under 15 Years	Percent Over 65 Years	Percent of Non-White Population	Percent of Renter occupied Housing	Percent of Families Below Poverty Level	Percent of Limited English Speaking Households
East Portland Neighborhood Office	7.7%	23.8%	8.8%	6.9%	0.0%	0.0%

Wildfire

Risk Reporting Area	Percent Under 15 Years	Percent Over 65 Years	Percent of Non-White Population	Percent of Renter occupied Housing	Percent of Families Below Poverty Level	Percent of Limited English Speaking Households
Central City	8.6%	11.6%	15.6%	61.9%	4.5%	0.8%
Central Northeast Neighborhoods	8.4%	28.6%	26.4%	44.6%	16.3%	10.0%
East Portland Neighborhood Office	23.0%	10.5%	25.9%	20.4%	5.9%	6.7%
Neighbors West/Northwest	15.5%	13.5%	16.9%	27.3%	3.3%	1.4%
North Portland Neighborhood Services	13.1%	9.5%	16.8%	29.9%	7.4%	1.6%
Southwest Neighborhoods, Inc.	14.6%	14.2%	12.8%	35.2%	4.1%	1.1%
Total	**16.9%**	**13.1%**	**17.5%**	**30.2%**	**4.5%**	**2.4%**

CRITICAL FACILITY EXPOSURE ESTIMATES

Critical Facility Definition

In 2007 the Portland Urban Area sponsored a review of critical infrastructure in the region. One of the outcomes of this process was to develop an agreed upon regional definition of Critical Infrastructure:

> Publicly and privately controlled systems and assets, including the built and natural environments and human resources, essential to the sustained functioning of the Portland/Vancouver metropolitan area including the Clackamas, Columbia, Multnomah and Washington Counties in Oregon and Clark County in Washington. Such systems and assets specifically include those necessary to ensure continuity of security, safety, health and sanitation services, support the area's economy and/or maintain public confidence. Incapacitation or destruction of any of these systems or assets would have a debilitating impact on the area either directly, through interdependencies and/or through cascading effects (Critical Infrastructure Protection Plan, Portland/Vancouver Urban Area; August 2007).

For this planning process, critical facilities and infrastructure within the planning area were be categorized and inventoried and include the following (Note: This database was built off of the best available data at the time of plan development. Additional facilities and infrastructure will be included as available data becomes available):

- **Emergency Services**
- **Schools**
- **Transportation Systems**
- **High Potential Loss Facilities**
- **Utility Systems**:
    - Communications
    - Power
    - Potable water
    - Wastewater
- **Other Assets**

Dam Failure

Mt Tabor Reservoir 1 inundation scenario

Risk Reporting Area	Emergency Services	Schools	Transportation Systems	High Potential Loss Facilities	Communications Facilities	Power Facilities	Potable Water Facilities	Wastewater Facilities	Other Assets	Total
Airport	0	0	0	0	0	0	0	0	0	0
Central City	0	0	0	0	0	0	0	0	0	0
Central Northeast Neighborhoods	0	0	0	0	0	0	0	0	0	0
East Portland Neighborhood Office	0	0	0	0	0	0	0	0	0	0
Neighbors West/Northwest	0	0	0	0	0	0	0	0	0	0
North Portland Neighborhood Services	0	0	0	0	0	0	0	0	0	0
Northeast Coalition	0	0	0	0	0	0	0	0	0	0
Southeast Uplift Neighborhood Program	0	1	0	0	0	0	0	0	1	2
Southwest Neighborhoods, Inc.	0	0	0	0	0	0	0	0	0	0
Total	**0**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**1**	**2**

Mt Tabor Reservoir 5 and 6 inundation scenario

Risk Reporting Area	Emergency Services	Schools	Transportation Systems	High Potential Loss Facilities	Communications Facilities	Power Facilities	Potable Water Facilities	Wastewater Facilities	Other Assets	Total
Airport	0	0	0	0	0	0	0	0	0	**0**
Central City	0	0	0	1	0	1	0	1	0	**3**
Central Northeast Neighborhoods	0	0	0	0	0	0	0	0	0	**0**
East Portland Neighborhood Office	0	0	0	0	0	0	0	0	0	**0**
Neighbors West/Northwest	0	0	0	0	0	0	0	0	0	**0**
North Portland Neighborhood Services	0	0	0	0	0	0	0	0	0	**0**
Northeast Coalition	0	0	0	0	0	0	0	0	0	**0**
Southeast Uplift Neighborhood Program	2	4	0	0	0	2	1	0	2	**11**
Southwest Neighborhoods, Inc.	0	0	0	0	0	0	0	0	0	**0**
Total	**2**	**4**	**0**	**1**	**0**	**3**	**1**	**1**	**2**	**14**

Washington Park reservoirs 3 and 4 inundation scenario

Risk Reporting Area	Emergency Services	Schools	Transportation Systems	High Potential Loss Facilities	Communications Facilities	Power Facilities	Potable Water Facilities	Wastewater Facilities	Other Assets	Total
Airport	0	0	0	0	0	0	0	0	0	**0**

Risk Reporting Area	Emergency Services	Schools	Transportation Systems	High Potential Loss Facilities	Communications Facilities	Power Facilities	Potable Water Facilities	Wastewater Facilities	Other Assets	Total
Central City	0	0	0	0	0	0	0	0	0	**0**
Central Northeast Neighborhoods	0	0	0	0	0	0	0	0	0	**0**
East Portland Neighborhood Office	0	0	0	0	0	0	0	0	0	**0**
Neighbors West/Northwest	0	0	0	0	0	0	3	0	0	**3**
North Portland Neighborhood Services	0	0	0	0	0	0	0	0	0	**0**
Northeast Coalition	0	0	0	0	0	0	0	0	0	**0**
Southeast Uplift Neighborhood Program	0	0	0	0	0	0	0	0	0	**0**
Southwest Neighborhoods, Inc.	0	0	0	0	0	0	0	0	0	**0**
Total	**0**	**0**	**0**	**0**	**0**	**0**	**3**	**0**	**0**	**3**

Flood

10 percent annual chance (10-year flood)

Risk Reporting Area	Emergency Services	Schools	Transportation Systems	High Potential Loss Facilities	Communications Facilities	Power Facilities	Potable Water Facilities	Wastewater Facilities	Other Assets	Total
Airport	0	0	0	0	0	0	0	0	0	**0**
Central City	1	0	4	0	0	0	0	0	0	**5**

Risk Reporting Area	Emergency Services	Schools	Transportation Systems	High Potential Loss Facilities	Communications Facilities	Power Facilities	Potable Water Facilities	Wastewater Facilities	Other Assets	Total
Central Northeast Neighborhoods	0	0	0	0	0	0	0	0	0	**0**
East Portland Neighborhood Office	0	0	1	0	0	0	0	0	0	**1**
Neighbors West/Northwest	1	0	0	0	0	2	0	0	0	**3**
North Portland Neighborhood Services	0	0	3	0	1	0	0	3	0	**7**
Northeast Coalition	0	0	0	0	0	0	0	0	0	**0**
Southeast Uplift Neighborhood Program	0	0	2	1	0	0	0	0	0	**3**
Southwest Neighborhoods, Inc.	0	0	0	0	0	0	0	1	0	**1**
Total	**2**	**0**	**10**	**1**	**1**	**2**	**0**	**4**	**0**	**20**

1 percent annual chance (100-year flood)

Risk Reporting Area	Emergency Services	Schools	Transportation Systems	High Potential Loss Facilities	Communications Facilities	Power Facilities	Potable Water Facilities	Wastewater Facilities	Other Assets	Total
Airport	0	0	1	0	0	0	0	0	0	**1**
Central City	2	0	12	0	0	0	0	0	0	**14**
Central Northeast Neighborhoods	0	0	0	2	0	0	0	4	0	**6**
East Portland Neighborhood Office	0	0	1	2	1	1	1	1	0	**7**
Neighbors West/Northwest	1	0	0	0	0	8	0	0	0	**9**

Risk Reporting Area	Emergency Services	Schools	Transportation Systems	High Potential Loss Facilities	Communications Facilities	Power Facilities	Potable Water Facilities	Wastewater Facilities	Other Assets	Total
North Portland Neighborhood Services	0	0	9	8	2	0	1	16	0	36
Northeast Coalition	0	0	0	0	0	0	0	0	0	0
Southeast Uplift Neighborhood Program	0	0	2	2	0	0	0	1	0	5
Southwest Neighborhoods, Inc.	0	0	0	0	0	0	0	2	0	2
Total	3	0	25	14	3	0	2	24	0	80

0.2 percent annual chance (500-year flood)

Risk Reporting Area	Emergency Services	Schools	Transportation Systems	High Potential Loss Facilities	Communications Facilities	Power Facilities	Potable Water Facilities	Wastewater Facilities	Other Assets	Total
Airport	0	0	1	0	0	0	0	0	0	1
Central City	7	4	18	3	0	4	0	6	1	43
Central Northeast Neighborhoods	0	0	0	2	0	0	0	4	0	6
East Portland Neighborhood Office	0	0	1	2	1	1	1	2	2	10
Neighbors West/Northwest	2	0	1	0	0	52	0	0	0	55
North Portland Neighborhood Services	0	0	10	22	2	3	1	24	0	62
Northeast Coalition	0	0	0	0	0	0	0	0	0	0
Southeast Uplift Neighborhood Program	0	0	2	2	0	0	0	1	0	5

Southwest Neighborhoods, Inc.	0	0	0	0	0	0	0	3	0	**3**
Total	9	4	33	31	3	60	2	40	3	**185**

Landslide

Risk Reporting Area	Emergency Services	Schools	Transportation Systems	High Potential Loss Facilities	Communications Facilities	Power Facilities	Potable Water Facilities	Wastewater Facilities	Other Assets	Total
Airport	0	0	0	0	0	0	0	0	0	**0**
Central City	0	0	0	0	1	0	1	1	0	**3**
Central Northeast Neighborhoods	0	1	2	0	1	0	2	0	0	**6**
East Portland Neighborhood Office	0	0	0	0	1	0	5	1	0	**7**
Neighbors West/Northwest	1	5	4	3	2	2	25	1	1	**44**
North Portland Neighborhood Services	0	0	0	2	0	0	0	5	0	**7**
Northeast Coalition	1	0	1	0	0	0	0	0	0	**2**
Southeast Uplift Neighborhood Program	0	0	0	0	1	0	2	3	0	**6**
Southwest Neighborhoods, Inc.	8	36	7	1	5	1	34	6	7	**105**
Outside City Boundary	0	0	0	0	0	0	12	0	0	**12**
Total	10	42	14	6	11	2	81	17	8	**192**

Volcano

Risk Reporting Area	Emergency Services	Schools	Transportation Systems	High Potential Loss Facilities	Communications Facilities	Power Facilities	Potable Water Facilities	Wastewater Facilities	Other Assets	Total
Airport	0	0	0	0	0	0	0	0	0	**0**
Central City	0	0	0	0	0	0	0	0	0	**0**
Central Northeast Neighborhoods	0	0	0	0	0	0	0	0	0	**0**
East Portland Neighborhood Office	0	0	0	4	1	1	35	1	0	**42**
Neighbors West/Northwest	0	0	0	0	0	0	0	0	0	**0**
North Portland Neighborhood Services	0	0	0	0	0	0	0	0	0	**0**
Northeast Coalition	0	0	0	0	0	0	0	0	0	**0**
Southeast Uplift Neighborhood Program	0	0	0	0	0	0	0	0	0	**0**
Southwest Neighborhoods, Inc.	0	0	0	0	0	0	0	0	0	**0**
Outside City Boundary	0	0	0	0	0	0	46	0	0	**46**
Total	**0**	**0**	**0**	**4**	**1**	**1**	**35**	**1**	**0**	**42**

Wildfire

Risk Reporting Area	Emergency Services	Schools	Transportation Systems	High Potential Loss Facilities	Communications Facilities	Power Facilities	Potable Water Facilities	Wastewater Facilities	Other Assets	Total
Airport	0	0	0	0	0	0	0	0	0	0
Central City	0	1	0	0	0	0	0	0	0	1
Central Northeast Neighborhoods	0	2	1	0	1	0	2	1	1	8

East Portland Neighborhood Office	0	1	0	0	1	1	18	1	0	22
Neighbors West/Northwest	1	4	4	3	2	1	23	1	1	40
North Portland Neighborhood Services	0	1	0	2	0	0	1	5	0	9
Northeast Coalition	0	0	0	0	0	0	0	0	0	0
Southeast Uplift Neighborhood Program	0	0	0	0	0	0	0	0	0	0
Southwest Neighborhoods, Inc.	5	26	4	1	3	1	22	6	6	74
Total	**6**	**35**	**9**	**6**	**7**	**3**	**66**	**14**	**8**	**154**

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Handout #3: Catalog of Mitigation Best Practices

BACKGROUND INFORMATION

Risk is defined as being a function of the:

- Hazard
- Exposure
- Vulnerability and
- Capability.

Risk can be reduced through mitigation by manipulating the hazard, reducing exposure to the hazard, reducing the vulnerability and/or increasing capability. And, where mitigation is not yet possible, the risk can be reduced through preparation, response or/and recovery. This list is not meant to be exhaustive, but to inspire thought. These are ideas for mitigation actions, not actions in their own right. The City of Portland in collaboration with stakeholders will take these ideas and concepts and look for specific ways to apply them for their own particular needs/situation. Steering committee and public engagement feedback will be incorporated as appropriate. You will notice that the City of Portland, its residents and its businesses are already engaged in many of these activities. In addition to identifying new actions, we also want to note and continue existing plans and programs. In general, the City of Portland and its stakeholders should capitalize on strengths and look for opportunities to overcome obstacles and weaknesses.

COLOR-CODING

Black text – general mitigation best practice
Italicized text – item identified through Strengths, Weaknesses, Obstacles or Opportunities Session
<u>Underlined text – action item identified and recommended by steering committee or other stakeholder (what we are working on today)</u>

ALL HAZARDS

Risk Reduction Measures	Hazard Category ALL HAZARDS			
	Manipulate Hazard	**Reduce Exposure**	**Reduce Vulnerability**	**Increase Capability**
Public (Individual) Scale	None	None	• Apply for permits as required and follow established building codes • Perform a vulnerability check on personal property	• Educate yourself on risk reductions methods • Educate yourself on early warning procedures • Purchase insurance for your home and valuables • Volunteer on community mitigation projects. • Develop household mitigation plan, such as creating a retrofit savings account, communication capability with outside, 2 week self-sufficiency during an event • Prepare a family post-disaster action plan • Get to know your neighbors • Participate in perishable data capture programs
Private (Business) Scale	None	None	• Establish/participate in a business-to-business mitigation mentoring program. • Perform a vulnerability check on property	• Educate your employees on the probable impacts from hazard events • Develop a Continuity of Operations Plan • Participate in perishable data capture programs

Risk Reduction Measures	Hazard Category **ALL HAZARDS**			
	Manipulate Hazard	**Reduce Exposure**	**Reduce Vulnerability**	**Increase Capability**
Government Scale	None	• Relocate critical facilities out of known hazard areas • Prohibit or limit public expenditures for capital improvements in known hazard areas • Acquire safe sites for public facilities (e.g., schools, police/fire stations, etc.) • Prohibit new facilities for persons with special needs/mobility concerns in hazard areas. • Prohibit animal shelters in known hazard areas	• Retrofit critical facilities within known hazard areas. • Organize a managed retreat from very high-risk areas. • Promote open space uses in identified high hazard areas via techniques such as: PUD's, easements, setbacks, greenways, sensitive area tracks • Acquire property in high hazard areas for use as open space • Offer expanded development rights to developers/businesses for performing mitigation retrofits • Incorporate mitigation retrofits for public facilities into the annual capital improvements program. • Installing quick-connect emergency generator hook-ups for critical facilities • *Continue mitigation programs started by some bureaus (water/BES) and incorporate those programs into the hazard mitigation plan* • *Replicate mitigation best practices developed by some bureaus in bureaus that do*	• Develop an all hazards public education campaign and resource center • Promote the purchase of insurance in known hazard areas • Designate high-risk zones as special assessment districts (to fund necessary hazard mitigation projects) • Incorporate a stand-alone element for hazard mitigation into the local comprehensive (land use) plan. • Develop a post-disaster reconstruction plan to facilitate decision making following a hazard event. • Involve citizens in comprehensive planning activities that identify and mitigate hazards • Adopt a post-disaster recovery ordinance based on a plan to regulate repair activity, generally depending on property location. • Adopt the International Building Code (IBC) and International Residential Code (IRC) • Increase the local Building Code Effectiveness Grading Schedule (BCEGS) classification through higher building code standards and enforcement practices. • Identify a funding mechanism for a local match to Federal funds that can fund private mitigation practices. • Identify and strengthen facilities so that they can function as public shelters • Provide hazard vulnerability checklists for homeowners to conduct their own inspections • Establish a technical assistance program for residents to access data or resources for mitigation purposes

Risk Reduction Measures	Hazard Category ALL HAZARDS			
	Manipulate Hazard	**Reduce Exposure**	**Reduce Vulnerability**	**Increase Capability**
			not have a strategy for incorporating mitigation into standard operating procedures • *Follow through with new/stronger Comprehensive Plan policies that set the stage for updating regulations and enhancing investments (implement these policies)* • *Continue to develop and institutionalize an asset management approach to budgeting and prioritizing infrastructure upgrades* • *Incorporate all hazard risk information into codes and policies and ensure that permits meet regulations for risk aversion and update as needed (especially environmental overlay zones)* • *Continue to support, incorporate and participate in projects that increase regional and local understanding of climate change and its impacts* • *Seek input from emergency responders on land use and development codes and regulation*	• Develop mutual aid agreements with other local governments/organizations • Warehouse critical infrastructure components such as pipe, power line, and road repair material • Develop a Continuity of Government Plan • Provide technical information and guidance during permitting and development process • Form a citizen plan implementation steering committee to monitor progress of local mitigation actions. Include a mix of representatives from neighborhoods, local businesses, and local government. • *Continue to collect and update data on population, building stock, etc. and look for opportunities to capture and incorporate missing hazard-related data* • *Continue to utilize subject matter expertise (e.g. keep CFMs on staff, partner with Cascade Volcano Observatory) in order to inform residents, businesses and other city staff of hazard risk and mitigation opportunities and gaps* • *Continue to work on engaging the public in hazard mitigation. Capitalize on civic, city and neighborhood pride. Use this messaging in framing mitigation.* • *Continue to seek/develop unique funding opportunities for mitigation projects and to seek grant opportunities whenever they are available.* • *Partner with creative industries that excel at education and marketing ideas and concepts to the general public* • *Continue to retain and hire City staff that is competent and cares about mitigation*

Risk Reduction Measures	Hazard Category ALL HAZARDS			
	Manipulate Hazard	**Reduce Exposure**	**Reduce Vulnerability**	**Increase Capability**
				• *Establish a program to systematically review and update regulations that address hazard risk* • *Establish a process to coordinate/ partner with local, state and federal agencies to maintain up-to-date hazard data, maps, and assessments.* • *Continue to build on strong community engagement standards* • *Continue to develop and expand the NET program and engage NET volunteers* • *Integrate the hazard mitigation plan with existing plans and programs such as CRS, climate action plan, Comprehensive Plan etc.)* • *Develop a bureau-wide mitigation working group for greater collaboration and information sharing* • *Develop and implement successful, effective, institutionalized systems, especially for equitable mitigation* • *Continue to seek ways to meaningfully engage non-English speaking and other underserved populations* • *Seek ways to promote the mitigation of private property.* • *Incorporate mitigation priorities into goals/missions of applicable bureaus* • *Seek novel ways to influence traditional processes* • *Maintain existing hazard databases and establish a program for collection of perishable data after hazard events* • *Seek opportunities to incorporate psychological preparedness and education into preparedness and mitigation related programs* • *Emphasize the need for endurance in post-disaster planning (e.g. more than 72 hours preparation)*

Risk Reduction Measures	Hazard Category ALL HAZARDS			
	Manipulate Hazard	**Reduce Exposure**	**Reduce Vulnerability**	**Increase Capability**
				• *Develop strategy to overcome risk from existing development patterns and seek opportunities to incentivize mitigation of private property* • *Utilize the natural features and resources of the planning area in planning for and mitigation from natural hazards* • *Focus on developing strategies that capture opportunities associated with the growing population and growth in the region* • *Perform an extensive literature and internal review of mitigation processes and practices that have provided beneficial results. Look to other communities such as LA, New Zealand, Japan.* • *Develop a bumper stick that says "keep" Portland Prepared* • *Ensure each action is measureable, tracked and shared publicly* • *Utilize informed, local media to increase publicity about mitigation* • *Engage local celebrities in sharing the mitigation message (Portlandia's Fred Arnison and Carrie Brownstein, actors from Grimm, the Blazers, the Timbers!)* • *Establish equitable criteria for action development and prioritization of actions.* • *Give the City the "right of refusal" after a major event* • *Develop games/fun activities about preparing ahead and surviving a disasters* • *Develop a recovery plan for the City of Portland.*

Risk Reduction Measures	Hazard Category **ALL HAZARDS**			
	Manipulate Hazard	**Reduce Exposure**	**Reduce Vulnerability**	**Increase Capability**
				• *Develop one "elevator speech" item per bureau. One action item that cannot be accomplished without additional resources* • *Ensure all actions have an estimated timeframe for completion that is reviewed and updated during the progress reporting process* • *Institute a climate change education program for the public that discusses how climate change will impact risk and vulnerability to hazard events* • *Work with CIRC to educate bureaus and create standard assumptions and models, internal consistency in application of data* • *Develop a phone tree with local community organizations, such as IRCO.* • *Identify a list of pre-approved MWSEB contractors for response/recovery efforts* • *Align budgeting cycle with hazard mitigation priorities – when new funding is requested, require review of NHMP priorities* • *Provide authority for use of the Resilience Bond Model*

DAM FAILURE

Risk Reduction Measures	Hazard Category			
	DAM FAILURE			
	Manipulate Hazard	**Reduce Exposure**	**Reduce Vulnerability**	**Increase Capability**
Public (Individual) Scale	None	• Relocate out of Dam Failure Inundation areas.	• Elevate your home to appropriate levels • Flood-proof your home to appropriate levels	• Learn the evacuation routes for a dam failure event • Educate yourself on early warning procedures. • Purchase flood insurance
Private (Business) Scale	• Remove privately owned Dams • Strengthen privately owned Dams	• Replace earthen dams with hardened structures	• Flood proof facilities within Dam Failure Inundation areas • Continue/ensure regularly scheduled engineering assessments of privately owned dams	• Develop and update Emergency Action Plans • Educate employees on dam failure evacuation routes • Educate employees on early warning procedures
Government Scale	• Remove government owned Dams • Strengthen government owned Dams	• Replace earthen dams with hardened structures	• Adopt higher regulatory floodplain standards in mapped Dam Failure/Inundation areas. • Consider low density land uses within identified Dam Failure/Inundation areas. • Continue/ensure regularly scheduled engineering assessments • Create easements in impoundment and downstream inundation areas • Study and evaluate impacts from climate change on dam operations	• Enhance Emergency Operations Plan to include a dam failure component. • Institute monthly communications checks with dam operators. Maintain up to date communications list. • Inform the public on risk reduction techniques and develop a communication plan • Adopt real-estate disclosure requirements for the re-sale of property located within Dam Inundation areas. • Establish early warning systems downstream of high hazard dams.

Risk Reduction Measures	Hazard Category			
	DAM FAILURE			
	Manipulate Hazard	Reduce Exposure	Reduce Vulnerability	Increase Capability
				• Update evacuation routes and educate the public on those routes • Promote the purchase of flood insurance in inundation areas • *Update scenario based Dam Failure/Inundation area maps.*

DROUGHT

Risk Reduction Measures	Hazard Category			
	DROUGHT			
	Manipulate Hazard	Reduce Exposure	Reduce Vulnerability	Increase Capability
Public (Individual) Scale	None	• Install stored water/captured water techniques, such as rain barrels or down spout gardens • Use permeable paving techniques whenever feasible	• Plant drought resistant landscapes • Reduce water system losses (e.g. fix drips) • Modify plumbing systems, i.e. water saving kits or grey water systems	• Practice active water conservation techniques
Private (Business) Scale	None	• Install stored water/captured water techniques, such as rain barrels or down spout gardens • Use permeable paving techniques whenever feasible.	• Plant drought resistant landscapes • Reduce private water system losses • Identify alternate water supply sources • Plant drought-resistant crop varieties • Develop and implement grey water systems	• Practice active water conservation techniques • Develop a water conservation plan
Government Scale	• Promote groundwater recharge through stormwater management • Implement cloud seeding techniques during dry season.	• Identify and create ground water back up sources • Create/identify new impounded water supply points • Use permeable paving techniques whenever feasible	• Plant drought resistant landscapes on community owned facilities • Distribute water saving kits to community members • Implement storm water retention in regions ideally suited for groundwater recharges • Reduce water system losses through regular maintenance • Design water delivery systems to accommodate drought events	• Identify alternative water supplies for time of drought • Develop a drought contingency plan • Develop criteria triggers for drought related actions • Improve accuracy of water supply forecasts • Modify rate structures to influence active water conservation techniques • Consider providing incentives to property owners that utilize drought resistant landscapes in the design of their home

Risk Reduction Measures	Hazard Category			
	DROUGHT			
	Manipulate Hazard	**Reduce Exposure**	**Reduce Vulnerability**	**Increase Capability**
			• *Integrate water conservation and green infrastructure into all applicable regulations/programs*	• Develop/Implement drought education/notification systems and communication plan • Emphasize droughts relationship to other hazards in hazard awareness messaging • Increase capability to enforce water restrictions when such restrictions are in place. • *Update/establish requirements on impervious surfaces*

EARTHQUAKE

Risk Reduction Measures	Hazard Category			
	EARTHQUAKE			
	Manipulate Hazard	**Reduce Exposure**	**Reduce Vulnerability**	**Increase Capability**
Public (Individual) Scale	None	• Locate outside of hazard area (off soft soils and other seismically induced ground failure areas) • *Remove buildings and do not build new buildings within 100 yards of an active fault (slip rate > 2 mm a year).*	• Retrofit structure (e.g. anchor house structure to foundation) • Secure household items that can cause injury or damage such as water heaters, bookcases, and other appliances • Build to higher design standards • *Install automatic earthquake gas shutoffs*	• Practice "drop, cover and hold" • Participate in drills such as the Great Shakeout • Purchase earthquake insurance
Private (Business Scale)	None	• Locate/relocate mission critical functions outside hazard area where possible (off soft soils and other seismically induced ground failure areas) • *Remove buildings and do not build new buildings within 100 yards of an active fault (slip rate > 2 mm a year).* • *Do not build critical facilities (Occupancy Class III and IV) on soft soil sites (SE and SF sites).* • *Do not build critical facilities (Occupancy*	• Build redundancy for critical functions/facilities • Retrofit critical buildings/areas housing mission critical functions • Perform non-structural assessments and mitigation activities (e.g. anchor bookcases to the wall) • Anchor rooftop-mounted equipment (i.e., HVAC units, satellite dishes, etc.). • *Install automatic earthquake gas shutoffs* • *Retrofit older office buildings to at least life-safety standards* • *Perform non-structural assessments of building contents* • Pursue *other non-structural mitigation including ceilings, troffer light fixtures, partition bracing,*	• Adopt higher standard for new construction -- Consider "performance based design' when building new structures • Increase capability by having cash reserves for reconstruction • Inform your employees on the possible impacts of earthquake and how to deal with them at your work facility • Participate in drills such as the Great Shakeout • *Purchase earthquake insurance*

Risk Reduction Measures	Hazard Category			
	EARTHQUAKE			
	Manipulate Hazard	**Reduce Exposure**	**Reduce Vulnerability**	**Increase Capability**
		Class III and IV) on sites with potential for seismic induced ground failure (lateral spreading, liquefaction, landslide).	*elevator rails, brick veneer, hollow clay tile around stairwells, etc.*	
Government Scale	None	• Locate critical facilities or functions outside of hazard area where possible (off soft soils and other seismically induced ground failure areas) • *Remove buildings and do not build new buildings within 100 yards of an active fault (slip rate > 2 mm a year).* • *Do not build critical facilities (Occupancy Class III and IV) on soft soil sites (SE and SF sites).* • *Do not build critical facilities (Occupancy Class III and IV) on sites with potential for seismic induced ground failure (lateral*	• Harden infrastructure • Provide redundancy for critical functions • Encourage mitigation of private property • Perform non-structural assessments and mitigation activities (e.g. anchor bookcases to the wall) • Require bracing of generators, elevators, and other vital equipment in hospitals. • Use flexible piping (earthquake resistant) when extending water, sewer, or natural gas service. • Install shutoff valves and emergency connector hoses where water mains cross fault lines. • Anchor rooftop-mounted equipment (i.e., HVAC units, satellite dishes, etc.). • Include retrofitting/replacement of critical system elements in Capital Improvements Plan (CIP) • *Install automatic earthquake gas shutoffs* • *Retrofit older office buildings to at least life-safety standards*	• Produce more accurate hazard maps (e.g. liquefaction and soils maps) • Further enhance seismic risk assessment to target high hazard buildings for mitigation opportunities (e.g. older structures, unreinforced masonry) • Develop a debris management plan • Participate in drills such as the Great Shakeout • Communicate earthquake secondary hazards to public (e.g. landslides, dam failure, fires, hazardous material spills) • Assess emergency response routes and determine back-up options in case of damage or disruption • Educate K-12, residents, developers and businesses on earthquake safety and building codes. • Require/encourage rapid damage assessment training for City staff • Develop and distribute guidelines or pass ordinances that require developers and building owners to locate lifelines, buildings, critical facilities, and hazardous materials out of areas subject to significant seismic hazards.

Risk Reduction Measures	Hazard Category			
	EARTHQUAKE			
	Manipulate Hazard	**Reduce Exposure**	**Reduce Vulnerability**	**Increase Capability**
		spreading, liquefaction, landslide).	• *Perform non-structural assessments of building contents* • *Pursue other non-structural mitigation including ceilings, troffer light fixtures, partition bracing, elevator rails, brick veneer, hollow clay tile around stairwells, etc.* • *Develop an inventory of critical facilities and keep it up to date* • *Require seismic upgrading of hospitals including phased nonstructural mitigation by XX date.* • *Require seismic upgrading of EOC, fire, police stations by XX date.* • *Add require seismic upgrading of school buildings by XX date.* • *Add require seismic upgrading of public and private URM buildings by XX date.* • *Add require seismic upgrading of public and private non-ductile concrete buildings by XX date.* • *Add require seismic upgrading of public and private soft first story buildings by XX date.* • *Review construction plans for all bridges to determine their susceptibility to collapse and retrofit problem bridges. Work with bridge owners to secure funding and prioritize retrofits/upgrades.* • *Seismically retrofit housing bureau buildings on the URM list or constructed prior to 1994*	• Support financial incentives, such as low interest loans or tax breaks, for home and business owners who seismically retrofit their structures. • Use Hazus to quantitatively estimate potential losses from an earthquake • Establish a school survey procedure and guidance document to inventory structural and non-structural hazards in and around school buildings • Use rapid visual screening to quickly inspect a building and identify disaster damage or potential seismic structural and non-structural weaknesses to prioritize retrofit efforts, inventory high-risk structures and critical facilities, or assess post-disaster risk to determine if buildings are safe to re-occupy • Develop a technical assistance information program for homeowners. • Create a seismic safety committee to provide policy recommendations, evaluate and recommend changes in seismic safety standards, and give an annual assessment of local and statewide implementation of seismic safety improvements • Develop an inventory of public and commercial buildings that may be particularly vulnerable to earthquake damage. • *Update residential building code so that it includes higher seismic standards for new or substantially improved buildings.* • *Initiate triggers guiding improvements such as: < 50% substantial*

Risk Reduction Measures	Hazard Category			
	EARTHQUAKE			
	Manipulate Hazard	**Reduce Exposure**	**Reduce Vulnerability**	**Increase Capability**
				damage/improvements or passive trigger programs for mandatory seismic strengthening • *Initiate program to require all homes sold in Portland to have earthquake automatic gas shut off valves.* • *Require higher standards for new construction of Occupancy Category II (and certain I?) buildings.* • *Require all schools and other government buildings to meet OC IV so they can be used as an earthquake emergency shelter.* • *Explore capability to have portable temporary bridge to cross Willamette.* • *Perform geotechnical assessment of subsurface* • *Capitalize on recent publicity regarding earthquake risk in the PNW* • *Determine a practical method to track buildings that are brought up to current seismic codes due to retrofit or permit requirement* • *Institute legislation that allows for rent controls after a certain percentage of housing stock is lost (e.g. post disaster)* • *Appoint an earthquake administrator – similar to a flood administrator* • *Perform a sediment seismic stability analysis for Hayden Island and develop appropriate mitigation items* • *Seek U.S. Resiliency Council certification* • *Institute bridge tolls to fund seismic retrofits*

FLOOD

Risk Reduction Measures	Hazard Category			
	FLOOD			
	Manipulate Hazard	**Reduce Exposure**	**Reduce Vulnerability**	**Increase Capability**
Public (Individual) Scale	• Clear stormwater drains and culverts	• Locate outside of hazard area • Elevate utilities above Base Flood Elevation (BFE) • Institute low impact development techniques on property	• Retrofit structure (elevate house above BFE) • Elevate items within house above BFE • Build new homes above BFE • Floodproof non-residential structures	• Comply with National Flood Insurance Program (NFIP) • Purchase flood insurance
Private (Business) Scale	• Clear stormwater drains and culverts	• Locate business critical facilities or functions outside hazard area • Institute low impact development techniques on property	• Build redundancy for critical functions/ retrofit critical buildings • Provide flood-proofing measures when new critical infrastructure must be located in floodplains	• Increase capability by having cash reserves for reconstruction • Support and implement hazard disclosure for the sale/re-sale of property in identified risk zones • Solicit 'cost-sharing' through partnerships with public sector stake holders on projects with multiple benefits
Government Scale	• Develop an adopt a "stormdrain" program • Dredge, construct levees, provide retention areas • Invest in structural flood control: levees, dams, channelization, revetments	• Acquire or relocate identified repetitive loss properties • Adopt land development techniques such as density transfers or clustering • Institute low impact development techniques on property	• Adopt appropriate regulatory standards such as cumulative substantial improvement/damage, freeboard, lower substantial damage threshold, compensatory storage • Develop and implement stormwater management regulations and master planning • Adopt "no-adverse impact" floodplain management policies that strive to not increase the flood risk on down-stream communities • Perform regular inspections/assessments of locally	• Join Community Rating System (CRS) program or maintain/improve class • Provide training for staff and decision-makers in floodplain management (e.g. maintain certified floodplain managers on staff) • Create a building and elevation inventory of structures in the floodplain • Develop a Flood Task Force • Prestage flood response equipment before events

Risk Reduction Measures	Hazard Category			
	FLOOD			
	Manipulate Hazard	**Reduce Exposure**	**Reduce Vulnerability**	**Increase Capability**
	• Construct regional stormwater control facilities • Harden areas with significant erosion concerns • Promote/retain natural vegetation in areas with significant erosion concerns	• Adopt sediment and erosion control regulations • Adopt zoning and erosion overlay districts • Prohibit any fill in floodplain areas • Encourage the use of porous pavement, vegetative buffers, and islands in large parking areas. • Use stream restoration to ensure adequate drainage and diversion of stormwater.	owned or maintained flood control infrastructure • Replace undersized culverts • Provide permanent protection for pump stations at risk of flooding • Identify/mitigate drainage issues resulting in ponding • Enhance road drainage programs or elevate/relocate roads subject to frequent flooding • Ensure permitting process is consistent with the adopted floodplain management ordinance • Develop an erosion protection program for high hazard areas • Construct open foundation systems on buildings to minimize scour • Construct deep foundations in erosion hazard areas • Establish a green infrastructure program • Use subdivision design standards to require elevation data collection during platting and to have buildable space on lots above the base flood elevation • Require tie downs of propane tanks • Require a drainage study with new development • Design a "natural runoff" or "zero discharge" policy for stormwater in subdivision design • Require and maintaining FEMA elevation certificates for all new and	• Integrate floodplain management policies into other planning mechanisms within the planning area • Develop framework/continue efforts for cooperation between agencies/districts in flood mitigation activities (e.g. sand and sand bag deployment) • Retain good standing in National Flood Insurance Program • Participate in information sharing with other agencies (e.g. USACE, NWS) • Identify and mitigate sources of nuisance flooding • Review and update floodplain damage prevention ordinances • Identify debris collection sites • Require/encourage rapid damage assessment training for staff • Map locations of storm drains, catch basins and dry wells so that they may be located and cleared • Identify and map erosion hazard areas • Develop a tracking program for erosion hazards and their impacts on the community • Pass and enforce an ordinance that regulates dumping in streams and ditches • Develop a stormwater committee • Form a regional watershed council

Risk Reduction Measures	Hazard Category			
	FLOOD			
	Manipulate Hazard	**Reduce Exposure**	**Reduce Vulnerability**	**Increase Capability**
			improved buildings located in floodplains • Extend the freeboard requirement past the mapped floodplain to include an equivalent land elevation • Include requirements in the local floodplain ordinance for homeowners to sign non-conversion agreements for areas below base flood elevation. • Offer incentives for building above the required freeboard minimum (code plus). • Inspect bridges and identify if any repairs or retrofits are needed to prevent scour • Floodproof critical facilities and infrastructure located in flood hazard areas • Require all critical facilities to meet requirements of Executive Order 11988 and be built 1 foot above the 500-year flood elevation • *Continue to improve and expand floodplain development regulations to meet higher standards* • *Develop maps that include information on climate change risk* • *Designate flood storage/conveyance areas* • *Expand the willing-seller program to a city-wide program* • *Consider implementing/providing information on flood-resilient building*	• Incorporate digital floodplain and topographic data into GIS systems, in conjunction with Hazus, to assess risk • Conduct NFIP community workshops to provide information and incentives for property owners to acquire flood insurance. • Increase drainage or absorption capacities with detention and retention basins, relief drains, spillways, drain widening/dredging or rerouting, logjam and debris removal, extra culverts, bridge modification, dike setbacks, flood gates and pumps, or channel redirection • *Produce more accurate flood hazard maps or identify areas for further study. Incorporate updated information from FEMA when available.* • *Convert hard copy first finished floor elevations for structures located in the floodplain into a digital database* • *Identify potential risk from flooding/channel migration downstream on Johnson Creek toward city boundary*

Risk Reduction Measures	Hazard Category			
	FLOOD			
	Manipulate Hazard	**Reduce Exposure**	**Reduce Vulnerability**	**Increase Capability**
			design (allowing and designing for first floors to flood)	

LANDSLIDE

Risk Reduction Measures	Hazard Category			
	LANDSLIDE			
	Manipulate Hazard	**Reduce Exposure**	**Reduce Vulnerability**	**Increase Capability**
Public (Individual) Scale	• Stabilize slope (de-water, armor toe) • Reduce weight on top of slope • Minimize vegetation removal and the addition • Install rip rap boulders of geotextile fabric • Using bioengineered bank stabilization techniques. • Use a rock splash pad to direct run off and minimize the potential for erosion	• Locate structures outside of hazard area (off unstable land and away from slide-run out area)	• Retrofit homes on steep slopes	• Sign up for warning systems • Learn the warning signs that indicate a landslide may occur • Educate yourself on risk reduction techniques for landslide hazards
Private (Business) Scale	• Stabilize slope (de-water, armor toe) • Reduce weight on top of slope • Minimize vegetation removal and the addition of impervious surfaces • Using bioengineered bank stabilization techniques. • Use a rock splash pad to direct run off and minimize the potential fort erosion	• Locate structures outside of hazard area (off unstable land and away from slide-run out area)	• Retrofit at risk facilities	• Sign up for warning system and develop evacuation plan • Increase capability by having cash reserves for reconstruction • Educate your employees on the potential exposure to landslide hazards and your emergency response protocol
Government Scale	• Monitor/review accumulated effects from piecemeal development on steep slopes • Implement post-fire vegetation management plans • Coordinate with resource management agencies to	• Acquire properties located in high risk landslide areas • Adopt land use policies that prohibit the placement of habitable structures in high risk landslide areas	• Adopt higher regulatory standards for new development within unstable slope areas • Armor/retrofit critical infrastructure from the impact of landslides	• Produce landslide hazard risk maps • Enact tools to help manage development in hazard areas: better land controls, tax incentives, information, limit new impervious/pervious surfaces

Risk Reduction Measures	Hazard Category			
	LANDSLIDE			
	Manipulate Hazard	**Reduce Exposure**	**Reduce Vulnerability**	**Increase Capability**
	identify potential issues from resource extraction activities • Using bioengineered bank stabilization techniques. • Use a rock splash pad to direct run off an minimize the potential fort erosion	• Adopt land use policies that limit accumulated effects in landslide risk areas	• Post signage in landslide hazard areas • Prohibit removal of natural vegetation from slopes • Assess vegetation in wildfire-prone areas to prevent landslides after fires (e.g., encourage plants with strong root systems). • *Prohibit onsite infiltration of collected stormwater (offsite drainage) in landslide hazard areas* • *Require geotechnical study for building/grading in landslide hazard area* • *Incorporate landslide risk areas in comprehnsive plan and increase regulations for risk reduction (see above)* • *Evaluate disconnect downspouts program/stormwater disconnect program. Do not promote in landside areas.* • *Develop new stormwater systems to redirect drainage away from landslide hazard.* • *Utilize landslide data in maintenance plans – roads, utilities, etc., For example, you can build a trench as a drain if used correctly – add as a standard evaluation.*	• Collect and compile landslide event history database • Develop plan/strategy for communicating risk to property owners/communities recently affected by wildfires • Increase regulatory authority for post-fire mitigation enforcement • Establish and communicate post-event repair responsibilities (e.g. roads that are impacted) • Conduct geological/engineering studies of potential slide areas • Notify property owners in high-risk areas • Develop a brochure describing risk and potential mitigation techniques • *Perform geotechnical assessment of subsurface* • *Update/establish requirements on impervious surfaces* • *Re-run HAZUS with new landslide areas (after DOGAMI study is completed)*

Risk Reduction Measures	Hazard Category			
	LANDSLIDE			
	Manipulate Hazard	**Reduce Exposure**	**Reduce Vulnerability**	**Increase Capability**
			• *Revisit density, vegetation, stormwater control in zoning.* • *Establish post-landslide disaster protocol. Geoengineers on retainer for immediate assessment/safety evaluation. Determine level of hazard – 1, 2, 3? Is it time to evacuate?*	• *Develop locally relevant thresholds for a generalized landslide warning system* • *Appoint a landslide administrator – similar to a flood administrator* • *Update landslide chapter in 2017 when new DOGAMI data can be included*

SEVERE WEATHER

Risk Reduction Measures	Hazard Category			
	SEVERE STORM/WEATHER			
	Manipulate Hazard	**Exposure**	**Vulnerability**	**Capability**
Public (Individual) Scale	• Increase tree plantings around buildings to shade parking lots and along public rights-of-way	None	• Insulate house • Provide redundant heat and power • Plant appropriate trees near home and power lines ("Right tree, right place" National Arbor Day Foundation Program) • Incorporate passive ventilation in the site design. • Secure loose items (i.e., patio furniture)	• Trim or remove trees that could affect power lines • Obtain a NOAA weather radio • Obtain an emergency generator • Identify locations of emergency shelters • Participate in amateur radio groups • Sign up for reverse 911 systems/other notification options • Post address so as to be visible to first responders • Teach school children about the dangers of lightning and how to take safety precautions.
Private (Business) Scale	• Increase tree plantings around buildings to shade parking lots and along public rights-of-way.	None	• Relocate critical infrastructure, such as power lines, underground • Install tree wire • Install lightning protection devices and methods, such as lightning rods and grounding, on communications infrastructure and other critical facilities • Install and maintain surge protection on critical electronic equipment. • Avoid placing flag poles or antennas near buildings	• Trim or remove trees that could affect power lines • Create redundancy in critical systems • Equip facilities with a NOAA weather radio • Equip vital facilities with emergency power sources
Government Scale	• Increase tree plantings around buildings to shade parking	None	• Trim trees back from power lines • Designate snow routes and strengthen critical road sections and bridges	• Support/continue programs such as "Tree Watch" that proactively manage problem areas by use of selective removal of hazardous trees, tree replacement, etc.

Risk Reduction Measures	Hazard Category			
	SEVERE STORM/WEATHER			
	Manipulate Hazard	Exposure	Vulnerability	Capability
	lots and along public rights-of-way.		• Continue/expand participation in Storm Ready programs • Continue to support/maintain/improve notification and warning systems • Support/continue/formalize shelter agreements • Ensure critical facilities have back-up power generation capabilities • Install lightning protection devices on critical facilities and communications equipment • Inspect/ensure facilities can withstand high winds • Encourage construction of guard rails where appropriate • Ensure critical facilities/shelters can easily transition to generator produced power • Stockpile response/preparedness supplies • Install and maintain surge protection on critical electronic equipment • Review building codes and structural policies to ensure they are adequate to protect older structures from wind damage • Use natural environmental features as wind buffers in site design • Incorporate inspection and management of hazardous trees	• Establish and enforce building codes that require all roofs to withstand snow loads and wind speeds • Improve communication alternatives/redundancy • Modify landscape and other ordinances to encourage appropriate planting near overhead power, cable, and phone lines • Provide NOAA weather radios to the public • Encourage coordination with amateur radio groups • Identify/ear mark funding opportunities for generator purchases • Develop evacuation/ emergency road plans and prioritize roads for response efforts • Encourage residents to sign-up for reverse 911 services or other notification services • Encourage/require residents to post addresses where they are visible to first responders • Include safety strategies for severe weather in driver education classes and materials. • Organize outreach to vulnerable populations, including establishing and promoting accessible heating centers in the community

Risk Reduction Measures	Hazard Category			
	SEVERE STORM/WEATHER			
	Manipulate Hazard	Exposure	Vulnerability	Capability
			into the drainage system maintenance process. • Preemptively test power line holes to determine if they are rotting • Use designed-failure mode for power line design to allow lines to fall or fail in small sections rather than as a complete system to enable faster restoration • Avoid placing flag poles or antennas near buildings • Convert traffic lights to mast arms	• *Develop and implement land use codes and policies to reduce the creation of and impacts from urban heat island effect* • *Update/establish requirements on impervious surfaces*

VOLCANIC HAZARDS

Risk Reduction Measures	Hazard Category			
	ASHFALL/DISTAL HAZARDS			
	Manipulate Hazard	Reduce Exposure	Reduce Vulnerability	Increase Capability
Public (Individual) Scale	None	• Identify equipment/resources that may be negatively impacted by ashfall and develop plan to move indoors/protect		• Sign up for early warning systems and notifications
Private (Business) Scale	None	• Identify equipment/resources that may be negatively impacted by ashfall and develop plan to move indoors/protect	• Build redundancy for critical facilities and functions	• Educate employees on impacts and emergency plans
Government Scale	None	• Identify equipment/resources that may be negatively impacted by ashfall and develop plan to move indoors/protect	• Retrofit older building stock to be able to support accumulated ashfall loads	• Develop post-event cleanup plan • *Work with Cascades Volcanoes observatory to update ashfall hazard modeling*

WILDFIRE

Risk Reduction Measures	Hazard Category			
	WILDFIRE			
	Manipulate Hazard	Exposure	Vulnerability	Capability
Public (Individual) Scale	• Clear potential fuels on property: dry, overgrown underbrush, diseased trees	• Create and maintain defensible space around structures • Reduce exposure --Locate outside of hazard area • Mow regularly • Stay clear of hazard areas during a wildfire event	• Create and maintain defensible space around structures, provide water on site. • Use fire-retardant building materials • Create defensible spaces around your home	• Employ "Firewise" techniques to safeguard your home • Identify alternative water supplies for fire fighting • Install/replace roofing material with non-combustible roofing materials • Ensure that all fuel-burning equipment should be vented to the outside • Install carbon monoxide monitors and alarms.
Private (Business) Scale	• Clear potential fuels on property: dry underbrush, diseased trees	• Create and maintain defensible space around structures and infrastructure • Reduce exposure -- Locate outside of hazard area	• Create and maintain defensible space around structures and infrastructure, provide water on site • Use fire-retardant building materials	• Support "Firewise" community initiatives • Create /establish stored water supplies to be utilized for fire fighting
Government Scale	• Clear fuels (dry underbrush, diseased trees) on land that can trigger and maintain wildfires • Implement "Best Management Practices"	• Create and maintain defensible space around structures and infrastructure • Enhance building code to include use of fire resistant materials in high hazard areas • Reduce exposure -- Locate outside of hazard area	• Create and maintain defensible space around structures and infrastructure • Use fire-retardant building materials • Develop/implement higher regulatory standards in wildfire hazard areas • Develop/support biomass reclamation initiatives • Increase regulatory requirements/code enforcement	• Seek alternative water supplies in urban wildland interface areas • Become a "Firewise" community • Utilize academia to study impacts/solutions to wildfire risk • Create/implement/update wildfire protection plans • Develop evacuation/ emergency road plans and prioritize roads for response efforts • Provide public outreach to increase understanding of forest management practices

Risk Reduction Measures	Hazard Category			
	WILDFIRE			
	Manipulate Hazard	**Exposure**	**Vulnerability**	**Capability**
	on public lands • Partner with local communities to create fire breaks		for fire risk reduction or incentivize higher standards • Develop fire smart building code regulations • Implement road side vegetation management best practices • Conduct pre-construction building inspections that include fire prevention requirements and provide emphasis on a fire resistant structure • Develop programs to identify/install wildland fire water supply systems such as cisterns, ponds and dry hydrants • Involve fire protection agencies in determining guidelines and standards and in development and site plan review procedures • Enclose the foundations of homes and other buildings in wildfire-prone areas, rather than leaving them open and potentially exposing undersides to blown embers or other materials. • Prohibit wooden shingles/wood shake roofs on any new development in areas prone to wildfires. • Routinely inspect the functionality of fire hydrants • Use prescribed burning to reduce fuel loads that threaten public safety and property.	• Enhance/provide redundant communication infrastructure • Require/encourage rapid damage assessment training • Pre-plan responses to wildland urban interface areas • Use zoning and/or a special wildfire overlay district to designate high-risk areas and specify the conditions for the use and development of specific areas • Develop a vegetation management plan • Work with insurance companies, utility providers, and others to include wildfire safety information in materials provided to area residents • *Develop regulations that specifically address urban wildfire interface zones* • *Update hazard maps using the newly developed LiDAR and vegetation class data* • *Plan for integration of defensible space and natural resource habitat management*

Risk Reduction Measures	Hazard Category			
	WILDFIRE			
	Manipulate Hazard	**Exposure**	**Vulnerability**	**Capability**
			• *Develop and implement invasive species management plans. Research best management practices and partner with local, regional organizations (e.g. colleges, fire districts, State)* • *Take advantage of allowances for City-specific building codes that restrict building materials* • *(more stringent than State)*	

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Handout #4: Action-storming Instructions

This portion of the meeting will involve break out group discussion. Each steering committee will attend 3 hazard discussion stations.

GOAL
Discuss and develop recommendations for mitigation action items to be included and highlighted in the mitigation best practices catalog.

STEERING COMMITTEE MEMBERS SHOULD:
1. Determine the top three hazards that you would like to discuss. Hazard discussion stations will include:
    a. Dam Failure/Flood
    b. Earthquake
    c. Landslide
    d. Severe Weather
    e. Wildfire
    f. Drought/Volcano/Space Weather
2. Jot down a few ideas that you have regarding potential action items or ideas that you would like to discuss with other steering committee members.
3. Move to the hazard discussion station of your choice and identify a note-taker.
4. Discuss possible mitigation action items as a group. Write down suggested actions on the note sheet provided. Please ***use as specific language as possible. If you have an idea for a performance metric or potential partners, please include this in your notes, but please do not get "caught in the weeds" in identifying these items at this time.***
5. Rotate stations and repeat.
6. If you have mitigation action ideas for stations that you did not visit, please feel free to write them down on index cards and submit them in the appropriate envelopes (labeled by hazard).

Please note that the planning team will collect and aggregate the information at the end of the meeting. Note takers, please submit your notes pages to the planning team at the end of the session. Additional discussion of identified action items will occur at the April meeting.

EXAMPLES OF POSSIBLE ACTIONS:
1. Determine a practical method to track buildings that are brought up to current seismic codes due to retrofit or permit requirement. This information can be included in future risk assessments to provide more accuracy. The public would also benefit from knowing what the seismic status is of buildings they occupy or visit.
2. Convert hard copy first finished floor elevations for structures located in the floodplain into a digital database.
3. Develop a recovery plan for the City of Portland.
4. Update wildfire risk maps using the newly developed LiDAR and vegetation class data.
5. Mitigate localized flooding issue at _____ and _____.

6. Develop an inventory of nuisance flooding issues within the City for mitigation. Develop an on-line reporting form where residents can report issues.
7. Develop an "adopt a storm drain" program, where residents can volunteer to clear debris from a particular storm drain.
8. Partner with Portland State University to perform a first look assessment at the potential for decreasing urban heat island effect by increasing the number of eco-roofs in the City.
9. Develop an on-line seismic retrofit resource center that provides easy to understand information on seismic retrofits, both structural and non-structural.
10. Identify a sustained source of funding to provide homeowner grants for seismic retrofits. Prioritize grant awards to economically disadvantaged households.
11. Develop a tracking system for identifying which Housing Bureau buildings have been retrofitted. Develop a system for prioritizing the retrofits of the remaining buildings.
12. Develop an on-line "mitigation for renters" resource center.
13. Require disclosure of known hazard areas (e.g. floodplain, high liquefaction potential soil) as part of the lease signing process.

MEETING SUMMARY

Date of Meeting:	March 16, 2016
Subject:	Steering Committee Meeting No. 8
Project Name:	City of Portland 2016 Natural Hazard Mitigation Plan Update
In Attendance: *Phone	**Steering Committee:** Brian Hoop (for Nickole Cheron), Danielle Brooks, Darlene Urban Garett, Darise Weller, Glen Collins, Jeff Soulages, Jeremy O'Leary, Jessica London, Jim Mattison, Pete O'Farrell (for Jonna Papaefthimiou), John Steup, Kathryn Hartinger, Kathy Roth, Laura Golino de Lovato (for Dean Stearman), Maggie Skenderian, Micah Meskel (for Bob Sallinger), Mary Ellen Collentine, Molly Emmons, Rich Grant, Rob Lee, and Solamon Ibe **Planning Team:** Danielle Butsick, Stephen Veith and Kristen Gelino **Non-voting Attendees and Members of the Public:** Kate Carone, Carl von Rohr, Kiel Moses and Jennifer Bellenap Williamson
Steering Committee Members (or alternate) Not Present:	Dean Alby, Casey Milne, Jennifer Levy, Karen Tam, Laurent Picard, Margaret Puckette, Ranfis Giannettino Villatoro, Ronault LS Catalani, Sherrie Forsloff, Simeon Mamaril, and Vicente Harrison
Summary Prepared by:	Kristen Gelino– 03/22/2016
Project No.:	103S3954
Quorum – Yes or No	Yes (21 voting members present)

Item	Action

Welcome and Introductions

- Jeremy O'Leary, acting chairperson for the March meeting, opened the meeting and facilitated round-table group introductions for all persons present.
- It was noted that a quorum of steering committee members was present.
- The meeting agenda was reviewed and no modifications were made.
- Handouts provided included: Agenda, February Meeting Summary (SC#7), Climate Action Plan Equity Implementation Guide, Working Issues Statements (HO#1), Social Vulnerability and Critical Facility Summary Tables (HO#2), Working Mitigation Best Practices Catalog (HO#3), Action-Storming Instructions (HO#4)
- Mr. O'Leary asked if any member of the public wished to address the committee. No members of the public were present who wished to provide comment.
- The February meeting summary was reviewed by the committee and approved by consensus.

Item	Action

- Mr. O'Leary reminded the committee about the voting cards in the meeting packets and asked that the committee please remember to use the cards during the meeting to streamline discussion.
- Danielle Butsick provided a few administrative updates to the committee:
  - The NHMP survey has received over 1,335 responses to date. There will be an email going out to all city employees asking them to complete the survey.
  - Three planning for real meetings have been scheduled and the planning team is working to schedule the remainder.
  - The second CEI stakeholder meeting was held last week and the planning team is now working on developing the draft report.

Climate Action Plan Equity Implementation Guide

Ms. Butsick introduced Desiree Williams-Rajee from the Bureau of Planning and Sustainability. Ms. Williams-Rajee provided background information on the development of the Climate Action Plan (CAP) and presented a draft of the Best Practices Toolkit and Equity Implementation Guide that had been developed through the CAP development process.

Issues And Capabilities Discussion and Break Out Group Instructions

Ms. Gelino briefly reviewed the contents of the meeting packet and briefly provided instructions on the breakout sessions that would begin after the break.

Ms. Butsick reminded the committee that she had asked for each committee member to think of two capabilities relevant for hazard mitigation that the City currently has or that they wish that City had. Ms. Gelino indicated that capabilities are important because the goal is to use the capabilities that the City has to guide the development of the action strategy and to identify actions that help to develop or enhance the capabilities that are desired. These actions should help to address the issues that have been identified through the planning process (note: the issues document presented is a working draft and steering committee members should submit any additional issues that have not yet been captured). The steering committee then took turns listing capabilities that the City has or are desired and/or issues that had not yet been identified. This exercise was intended as framing for the breakout sessions.

Item	Action

Key capabilities listed included:

- The NHMP steering committee – we have a strong committee now, but currently no resources to maintain the momentum.
- City staff doesn't have sufficient knowledge of hazards and relies too heavily on PBEM
- The city should partner with local businesses who have additional capacity
- PPS is doing lots of non-structural mitigation in schools
- The city should work with volunteer organizations and businesses that make money from preparedness enthusiasm and ask them to "give back"
- Concerns about fuel availability – the city should partner with fuel infrastructure owners/operators
- Critical transportation routes, how will we prioritize and do repairs?
- The city has lots of data but doesn't share it well between bureaus
- The city has great diversity of thought and backgrounds
- We lack up-to date maps that are accessible to the public and bureau staff
- We lack coordination on flood planning and need an updated multi-scalar citywide plan
- There is substantial monitoring of environmental baseline conditions that highlights current issues
- Remedies proposed for environmental cleanup might not take into consideration potential impacts from an earthquake; we as a committee can lobby as a group
- The city should adopt the goals of the OR Resilience Plan and do vulnerability assessments with a 50-year plan to upgrade infrastructure – if the city isn't prepared, the economic engine can't be restarted
- The city has the capability to mandate seismic retrofits, but doesn't have funding to implement – could use URM committee as a model
- The city needs to collaborate internally on engaging people with disabilities; fund a community organization for disability through ONI
- Our bridges keep Portland together, but divide it if they fail

Item	Action

- We have strong personal and family preparedness for city employees
- The city should enhance communication with Multnomah County
- The city should improve zoning and regulation for Linnton and hazardous materials
- The infrastructure in the Bull Run watershed is at risk
- We have a large membership of backyard habitat certified homes with strong natural science understanding; many of them are in landslide areas
- There should be a multi-bureau committee for implementation and oversight for the NHMP; strong implementation is important
- The city has a strong communications system – ARES
- Currently we have a strong emergency preparedness education program for people with disabilities, but have lost funding through CDC
- Robust education program for home retrofitting; we need a community resource center with retrofit plans and classes
- We need a funding mechanism for renters who rent old or seismically unsafe homes
- We have a strong network of community groups and marginalized groups, but no continuity of operations plans for them
- After an earthquake we would likely see massive displacement in the SE as downtown businesses move out
- Other jurisdictions have authority to do things but they aren't talking; the city should promote interjurisdictional partnerships and action

Small Group Action-Storming

The remainder of the meeting was spent in small group discussions. Steering committee members brainstormed possible actions items, which were recorded and will be aggregated by the planning team. Notes from the sessions will be distributed along with this meeting summary.

Public Comment and Next Steps

- This portion of the agenda was not completed due to the length of the meeting.
- The meeting was adjourned at 7:45 PM. The next steering committee meeting is:

Item	Action

April 20 , 2016 at 4:00 PM
Portland Public Schools Blanchard Education Service Center
Wy'East Conference Room, Level L1
501 N Dixon St.
Portland, OR 97227
Call in number: 1-800-523-8437 code: 707-186-3750

Note: The April meeting will run from 4:00 PM to 8:00 PM. There will not be
a May steering committee meeting.