

# 1. Goals, Objectives, and Mitigation Strategies

Listed below in section 1.2 are mitigation strategies that were created by the City of Shoreline and the UW Institute for Hazards Mitigation project team based on the risk assessment and input from the technical stakeholder meeting. These mitigation strategies describe an action plan to reduce loss from future hazard events in the City of Shoreline.

It is also important to note that some of the mitigation strategies suggested below are more accurately defined as response and recovery actions rather than pure mitigation. These items convey recommendations that support the goals and objectives of this plan and are crucial to the life safety of Shoreline residents. These recovery and response items are designated as such in the strategies below. At this time, alternative strategies that would be purely mitigation cannot be recommended because they are not cost beneficial. Mitigation grant funds may not be available for response or recovery items, but they are, nonetheless, important to achieving the overall objectives of this plan.

When reading the mitigation strategies, please begin to think about the prioritization of these mitigation strategies. When thinking about the prioritization it is important to take into account the benefit and the cost for each of the mitigation strategies.

Each mitigation strategy describes the problem/opportunity, how to implement it, responsible agencies, funding sources, implementation cost, timeline, associated hazards and related goal and objective.

Below in section 1.1 are the goals and objectives developed for the hazard mitigation plan so that you can cross-reference them with the mitigation strategies.

## 1.1. Goals and Objectives

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### **Goal 1: Protect public health, welfare, and public safety**

#### ***Objective 1.1: Increase public awareness of hazards***

Mitigation strategies that achieve this objective:  
M-2, M-8, M-22

#### ***Objective 1.2: Encourage involvement of community in risk reduction programs***

Mitigation strategies that achieve this objective:  
M-6, M-13, M-23

**Goal 2: Minimize losses to existing and future properties**

*Objective 2.1: Support programs and initiatives to reduce risk to property and the surrounding environment*

Mitigation strategies that achieve this objective:  
M-10, M-25, M-27, M-28

*Objective 2.2: Support programs and initiatives to reduce risk in residential, commercial, and governmental structures, especially those prone to hazards*

Mitigation strategies that achieve this objective:  
M-5, M-9, M-11, M-14

*Objective 2.3: Support upgrades to critical infrastructure and facilities*

Mitigation strategies that achieve this objective:  
M-4, M-7

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**Goal 3: Encourage coordination and communication amongst public and private organization**

*Objective 3.1: Encourage organizations, businesses, and local governmental agencies within community and region to develop partnerships*

Mitigation strategies that achieve this objective:  
M-15, M-16, M-18, M-19, M-20

*Objective 3.2: Promote consistencies in communication, plans and policies to facilitate coordination between all involved groups*

Mitigation strategies that achieve this objective:  
M-1

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## **Goal 4: Ensure continuity of critical facilities and corresponding operations of local government**

### ***Objective 4.1: Support redundancy of critical government functions***

Mitigation strategies that achieve this objective:  
M-12, M-21

### ***Objective 4.2: Promote use of new technology in critical operations***

Mitigation strategies that achieve this objective:  
M-3, M-24, M-26

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## **Goal 5: Protect and promote environmental quality**

### ***Objective 5.1: Encourage low impact development***

Mitigation strategies that achieve this objective:  
M-17

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## **1.2. Mitigation and Implementation Strategies**

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### ***Definitions***

**Problem/Opportunity:** This describes either a problem or possible opportunity to reduce risk.

**Implementation Strategy:** Each mitigation strategy includes ideas to implement and accomplish the specific project.

**Lead Agency:** This is the agency or agencies that will organize resources, find appropriate funding or oversee project implementation, monitoring and evaluation.

**Funding Source:** This offers suggestions on potential financial resources for implementing the mitigation strategy. This includes funding from government agencies as well as various different types of grants.

**Implementation Cost:** This is the approximate amount that the strategy will cost to implement.

**Timeline:** This estimates the amount of time it will take to begin implementation of each strategy. Under timeline there are three categories, short term, long term and ongoing. Short Term means that the mitigation strategy will be implemented in years 1 to 2. Long Term means that mitigation strategy will be implemented in years 3 to 5. Ongoing means that the mitigation strategy will be implemented in years 1 to 5 and will continue into the future indefinitely.

Associated Hazards: Each mitigation strategy is related to one or more of the hazards that could affect Shoreline.

Related Goal and Objective: Each mitigation strategy is related to a Goal and Objective listed in Section X.

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**M-1: Create a full time position in the City of Shoreline for an Emergency Management Coordinator.**

**Problem/Opportunity:** An Emergency Management Coordinator would coordinate mitigation strategies created in this plan.

**Implementation Strategy:** Employ an Emergency Management Coordinator to administer mitigation actions throughout the City of Shoreline. Some strategies the coordinator would work with include:

- Coordinate the monitoring, maintenance and updating of the Shoreline Hazard Mitigation Plan.
- Develop and coordinate the City's emergency management and emergency preparedness programs.
- Plan, oversee and provide training in all aspects and phases of emergency management.
- Coordinate annual updates of the City's comprehensive emergency plan.
- Organize partnerships among business, industry and local government.
- Initiate public awareness and education campaigns for all hazards.
- The coordinator would implement mitigation strategies M-2, M-3, M-4, M-5, M-6, M-8, M-9, M-11, M-12, M-13, M-14, M-15, M-16, M-18, M-19, M-20, M-21, M-22 and M-23.

**Lead Agency:** City Manager's Office

**Funding Source:** Shoreline Operating Budget

**Implementation Cost:** \$75,000

**Timeline:** Short Term

**Associated Hazards:** All Hazards

**Related Goal and Objective:** Goal 3, Objective 3.2

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**M-2: Create a community wide comprehensive education program to educate the public about hazards and hazard mitigation.**

**Problem/Opportunity:** One of the most important elements to mitigation is awareness. Residents are often unaware of the risk of hazards and what actions to take during a disaster event. Public awareness programs can provide information about mitigation measures for different hazards as well as preparedness, response and recovery measures after a disaster event. During and after a hazard event, emergency responders may be either overwhelmed with emergency calls or unable to access some residents. This means that it is important that individual households are prepared for an event and have the ability to support themselves for a period of time while emergency responders deal with more immediate and life-threatening situations.

**Implementation Strategy:** The education program should be an ongoing program that is devoted to increasing the public's awareness of what hazards affect Shoreline and what can be done to mitigate these hazards and their effects. Following a disaster event, there should be extra efforts to provide the public with information about disaster preparedness and mitigation measures. Generally the public is very receptive to this type of information at this time. The Emergency Management Coordinator outlined in M-1 could implement this strategy. Some of the measures that should be taken to educate the public are:

- Evaluate success of current public education efforts.
- Develop and index a mitigation/preparedness packet for the public and for the media for each type of hazard affecting Shoreline.
- Draft a campaign strategy to effectively distribute information about hazards and hazard mitigation.
- Create a link on the city's web page that is specifically devoted to providing current information about hazards and hazard mitigation. This would include static information about existing hazards and up-to-date information on disaster events affecting Shoreline. For example, there could be information about what to do during an earthquake as well as information about a specific flood event currently occurring in Shoreline.
- Maintain sufficient fund balance earmarked for advertising and public service announcements (PSA).
- Develop and implement workshops and training programs that address specific issues related to the hazards affecting Shoreline. An example would be providing a workshop on how to non-structurally retrofit buildings in order to minimize loss from an earthquake.

**Lead Agency:** Police Department

**Funding Source:** Shoreline Operating Budget, Emergency Management Performance Grant (EMPG), Hazards Mitigation Grant Program (HGMP), Pre-Disaster Mitigation Program

**Implementation Cost:** The initial cost would be about \$50,000 and would include the material assembly, printing and distribution. The continuing cost would be about \$20,000 per year and would include development and implementation of workshops and training programs. Included in this cost would be mitigation strategies M-22, M-8, M-23, M-13, M-14 and portions of M-9 and M-5.

**Timeline:** Ongoing

**Associated Hazards:** All Hazards

**Related Goal and Objective:** Goal 1, Objective 1.1

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**M-3: Create and maintain a partnership with utility providers to ensure that the utility infrastructure serving Shoreline is retrofitted or built to standards that make them less vulnerable in a hazard event including critical infrastructure protection.**

**Problem/Opportunity:** Utility infrastructure in Shoreline may be at risk to failure during or after an event. There are methods of retrofitting or building to a certain standard that will reduce the risk of failure.

**Implementation Strategy:** The Emergency Management Coordinator outlined in M-1 could implement this strategy.

- Develop a contact at each of the utility providers in Shoreline so that the city can stay updated about what is being done to reduce risk.
- Jointly analyze high-risk areas and develop mitigation strategies that address the risk. Initial focus should be given to infrastructure in NEHRP E soils.
- Maintain contact and work with utility providers to ensure that the utility infrastructure is retrofitted or built to standards that make them less vulnerable in a hazard event.

**Lead Agency:** Public Works

**Funding Source:** Shoreline Operating Budget

**Implementation Cost:** No significant additional cost for Shoreline

**Timeline:** Ongoing

**Associated Hazards:** All Hazards

**Related Goal and Objective:** Goal 4, Objective 4.2

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**M-4: Create and maintain a partnership with Washington State Department of Transportation (WSDOT) to ensure that the I-5 overpasses located in Shoreline are retrofitted to current seismic standards within a reasonable time frame.**

**Problem/Opportunity:** Interstate 5 has four bridges at 145th, 155th, 175th and 185th that were built about 1963-64 when there was no consideration given to seismic design. The I-5 bridges in Shoreline are on the WSDOT 05-07-biennium seismic retrofit recommendation list. However, due to lack of funding these bridges may not be retrofitted for another 8-10 years. Collapse of these bridges could potentially split the town in half, isolating sections from essential services such as fire and police. There is also a WSDOT pedestrian bridge at 195th that should be evaluated for seismic design. Although not mentioned in the Shoreline Hazard Inventory Vulnerability Assessment as vulnerable because of seismic design the overpasses at 165<sup>th</sup> and 205<sup>th</sup> should be considered when working with the WSDOT.

**Implementation Strategy:** The Emergency Management Coordinator outlined in M-1 could implement this strategy.

- Develop a contact at WSDOT so that the city can stay updated about when the overpasses will be retrofitted and any delays that might occur.
- Maintain contact and work with WSDOT to ensure that the I-5 overpasses in Shoreline are retrofitted to current seismic standards within a reasonable time frame.

**Lead Agency:** City Manager's Office

**Funding Source:** Shoreline Operating Budget

**Implementation Cost:** No significant additional cost for Shoreline

**Timeline:** Long Term

**Associated Hazards:** Earthquakes

**Related Goal and Objective:** Goal 2, Objective 2.3

**M-5: Implement non-structural retrofitting in city facilities and provide incentives for non-structural retrofitting for privately owned structures throughout the city.**

**Problem/Opportunity:** Most injury and business loss is due to non-structural damage such as toppling shelves and hazardous material spills, which are largely preventable through relatively simple, non-structural measures.

**Implementation Strategy:** Incentives could be monetary or non-monetary. Non-monetary incentives could include providing information and/or training about how to implement non-structural retrofitting. The Emergency Management Coordinator outlined in M-1 could implement this strategy.

- Coordinate assessments of non-structural hazards for city facilities.
- Prioritize the order by which city facilities should be non-structurally retrofitted.
- Implement non-structural retrofitting in city facilities using the prioritization list.
- Provide education and training about non-structural hazards and non-structural retrofitting for critical facilities, schools, health care facilities, residences and businesses. Initial focus should be given to facilities on NEHRP D and E Soils.
- Apply for grants that could provide funding for non-structural retrofitting.

**Lead Agency:** Public Works Department

**Funding Source:** Shoreline Operating Budget

**Implementation Cost:** For non-structural assessment and non-structural retrofitting of city facilities the cost would be about \$25,000. The education and training component is included in the cost of M-2.

**Timeline:** Ongoing

**Associated Hazards:** Earthquakes

**Related Goal and Objective:** Goal 2, Objective 2.2

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**M-6: Identify critical community facilities and infrastructure that are without back up power generators.**

**Problem/Opportunity:** Hazard events frequently cause power outages and create disruptions to the operation of important community facilities. In some cases, power outages can be life threatening for those who are on life support or otherwise require electricity for basic life functions. It is especially important that facilities designated as emergency shelters have back up power generators. Back up power generators supply the needed electricity to maintain operations until the power supply is restored.

**Implementation Strategy:** The Emergency Management Coordinator outlined in M-1 could implement this strategy.

- Identify the critical community facilities and infrastructure within the city that currently do not have back up power capacity.
- Provide incentives for facilities and infrastructure without backup power so that they acquire a source of back up power sufficient to maintain necessary operations. Examples of incentives are:
  - Providing information on the importance of a back up power source.
  - Work with utility providers as a possible funding source.

**Lead Agency:** Police Department

**Funding Source:** Shoreline Operating Budget

**Implementation Cost:** No significant additional cost to Shoreline

**Timeline:** Short Term

**Associated Hazards:** All Hazards

**Related Goal and Objective:** Goal 1, Objective 1.2

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**M-7: Identify and assess critical and essential city infrastructure and facilities.**

**Problem/Opportunity:** Throughout the City of Shoreline there are critical and essential city infrastructure and facilities that must be functioning during and immediately after a disaster. These include transportation infrastructure such as retaining walls and bridges and facilities such as shelters and critical city facilities. In order to assure that these are functioning during or after a disaster, they must be identified and assessed to determine if any new infrastructure or facilities are needed or if mitigation can reduce the risk from disasters.

**Implementation Strategy:**

- Identify critical and essential city infrastructure and facilities.
- Analyze critical and essential city infrastructure and facilities and determine problem areas.
- Prioritize critical and essential city infrastructure and facilities that need mitigation.

**Lead Agency:** Public Works

**Funding Source:** Shoreline Operating Budget

**Implementation Cost:** No significant additional cost for Shoreline

**Timeline:** Ongoing

**Associated Hazards:** All Hazards

**Related Goal and Objective:** Goal 2, Objective 2.3

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**M-8: Assure that the public is informed of the necessity of maintaining a 3-day supply of food and water, along with basic first aid and medical supplies.**

**Problem/Opportunity:** During and after a hazard event, emergency responders may be either overwhelmed with emergency calls or unable to access some residents. It is important that individual households are prepared for a period of self-sufficiency while responders deal with more immediate and life-threatening situations. Assuring that the public is informed of the necessity of maintaining a 3-day supply is a preparedness measure that must be implemented until mitigation measures can be implemented that appropriately address the issue of isolation.

**Implementation Strategy:** Educate the public about the necessity of maintaining a 3-day supply for emergencies. The Emergency Management Coordinator outlined in M-1 could implement this strategy. Some important elements of maintaining a 3-day supply are:



- A three-gallon supply of water per person stored in sealed, unbreakable containers.
- A supply of non-perishable packaged or canned food and a non-electric can opener.
- A first aid kit and prescription medications.
- A battery-powered radio, flashlight and plenty of extra batteries.

To implement this program refer to M-2, which describes the methodology of how to distribute information community wide.

**Lead Agency:** Police Department

**Funding Source:** Shoreline Operating Budget, Emergency Management Performance Grant (EMPG)

**Implementation Cost:** Included in M-2

**Timeline:** Ongoing

**Associated Hazards:** All Hazards

**Related Goal and Objective:** Goal 1, Objective 1.1

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**M-9: Provide incentives for voluntary structural retrofitting of older structures on vulnerable soils.**

**Problem/Opportunity:** It is estimated that there are 3,759 structures built on NEHRP D soils and 57 structures built on NEHRP E soils built before 1972 that are at risk to being jolted off of their foundation during an earthquake. Existing homes can be anchored to their foundations for a cost between \$1,000 and \$5,000 depending on whether the basements or crawl spaces are unfinished and who conducts work. For example, in Seattle, homeowners have voluntarily retrofitted over 1,000 homes.

**Implementation Strategy:** Incentives could be monetary or non-monetary. Non-monetary incentives could include providing information and/or training about how to implement structural retrofitting of older structures. The Emergency Management Coordinator outlined in M-1 could implement this strategy.

- Evaluate and record the construction material of the structures on NEHRP D and E soils built before 1972. Initial focus should be given to structures on E soils built before 1972.
- Provide information and training about structural retrofitting for property owners with structures located on NEHRP D and E soils. Initial focus should be given to structures on E soils built before 1972.
- Apply for grants that could provide funding for structural retrofitting of older structures on vulnerable soils.
- It is possible that some structures cannot be retrofitted due to construction material and type. The owners of these structures should be provided with information about the risk resulting from potential earthquakes.

**Lead Agency:** Planning and Development Services Department, Public Works

**Funding Source:** DHS/FEMA funding for cost-effective projects, Shoreline Operating Budget

**Implementation Cost:** The city should apply for a grant that would allow for retrofitting. The amount needed would be about \$250,000. This would allow for about \$5,000 for each of the 57 structures located on NEHRP E Soils built before 1972. The education and training component is included in M-2.

**Timeline:** Long Term

**Associated Hazards:** Earthquake

**Related Goal and Objective:** Goal 2, Objective 2.2

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**M-10: Improve\expand storm water drainage, dams, detention and retention system capabilities.**

**Problem/Opportunity:** Flooding in Shoreline is related inadequate capacity in the water system and the large amount of impervious surfaces. During and after heavy rains there has been flooding of roadways, yards and driveways and several structures.

**Implementation Strategy:**

- Analyze reports of flooding from past years and determine problem areas.
- Determine if drainage, dams, detention and retention system capabilities are adequate in these areas.
- Prioritize areas that need the drainage, dams, detention and retention system capabilities expanded.
- Begin expanding the drainage, dams, detention and retention system capabilities in the order of prioritization.
  - Refer to M-17 for low impact development measures that can be taken to address this problem.

**Lead Agency:** Public Works Department

**Funding Source:** Shoreline Capital Improvement Budget, Hazards Mitigation Grant Program (HGMP), Pre-Disaster Mitigation Program

**Implementation Cost:** No significant additional cost for the analysis. Expansion costs cannot be determined until the analysis is completed.

**Timeline:** Long Term

**Associated Hazards:** Flooding

**Related Goal and Objective:** Goal 2, Objective 2.1

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**M-11: Identify critical city facilities and infrastructure and acquire back up power generators for those currently without.**

**Problem/Opportunity:** Hazard events frequently cause power outages and create disruptions to the operation of important city facilities. In some cases, power outages can cause city operations to be unable to function as necessary. Back up power generators supply the needed electricity to maintain operations until the power supply is restored.

**Implementation Strategy:** The Emergency Management Coordinator outlined in M-1 could implement this strategy.

- Identify critical city facilities that currently do not have back up power capacity.

- Prioritize the list of critical city facilities that do not have back up power capacity by which facilities are most important in maintaining the critical functions of Shoreline.
- Acquire a source of back up power sufficient to maintain necessary operations for these city facilities using the prioritization list.

**Lead Agency:** Public Works Department

**Funding Source:** Shoreline Operating Budget

**Implementation Cost:** For the assessment, there is no significant additional cost for Shoreline. There is no way to determine the cost for acquisition of back up generators until it is determined how many facilities need back up power generators.

**Timeline:** Short Term

**Associated Hazards:** All Hazards

**Related Goal and Objective:** Goal 2, Objective 2.3

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**M-12: Identify critical government functions and establish backup operations for these functions.**

**Problem/Opportunity:** During and immediately after a disaster it is important that critical government functions continue to operate. It is important that there is backup operations so that if a function is disrupted it can be performed at an alternative location or through an alternative department.

**Implementation Strategy:** The Emergency Management Coordinator outlined in M-1 could implement this strategy.

- Identify critical government functions and services and assess where backup operations are needed.
- Conduct exercises that test functionality during extended periods of isolation.
- Develop contingency plans for essential and critical services such as:
  - Temporary relocation
  - Out-of-area mutual aid
  - Offsite storage of critical work files
  - Offsite capabilities for critical information technology (IT) systems
  - Employee/family preparedness
  - Emergency communications and transportation systems
  - Emergency supplies that may be needed after a disaster

**Lead Agency:** City Manager's Office

**Funding Source:** Shoreline Operating Budget

**Implementation Cost:** No significant additional cost to Shoreline

**Timeline:** Long Term

**Associated Hazards:** All Hazards

**Related Goal and Objective:** Goal 4, Objective 4.1

**M-13: Educate homeowners, developers and business owners about how to reduce impacts of urban flooding.**

**Problem/Opportunity:** In Shoreline, the large amount of impervious surfaces prevents natural absorption of rainwater and increases urban flooding. Urban flooding is the main flooding concern in Shoreline and homeowners, developers and business owners can take measures to reduce this problem.

**Implementation Strategy:** Provide education for homeowners, developers, and business owners about specific measures that can be taken to reduce urban flooding. The Emergency Management Coordinator outlined in M-1 could implement this strategy.

Some measures to reduce impacts of urban flooding are:

- **Adopt-A-Storm-Drain:** By adopting nearby storm drains and cleaning them out when they become covered with debris, private homeowners, developers and business owners can reduce urban flooding. By clearing the storm drain, it will allow the storm drains to collect water at full capacity.
- **Low Impact Development:** Low impact development has the potential to alleviate the adverse impacts of urban flooding. Two examples of low impact development are:
  - **Depression Gardening:** When possible, homeowners should use the lowest point on their property for planting a garden. The garden will absorb water and stay green while reducing surface water flow.
  - **Rain Barrels:** By using rain barrels, homeowners can collect rain from their roof. Rain barrels keep the ground from becoming oversaturated as a result of heavy rains and create a free water source for use around the yard during summer months.
  - For other examples of low impact development refer to M-17.

To implement this program refer to M-2, which describes the methodology of how to distribute information community wide.

**Lead Agency:** Public Works Department

**Funding Source:** Shoreline Operating Budget

**Implementation Cost:** Included in M-2

**Timeline:** Ongoing

**Associated Hazards:** Flooding

**Related Goal and Objective:** Goal 1, Objective 1.2

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**M-14: Provide incentives for non-structural retrofitting of hazardous materials containment throughout the city.**

**Problem/Opportunity:** The greatest damage from an earthquake may be to non-structural building elements such as hazardous materials containment. Retrofitting of non-structural elements is a simple, inexpensive method to help prevent hazardous material damages during an earthquake. An example would be securing propane tanks or other fuel containers to a wall or to the ground.

**Implementation Strategy:** Incentives could be monetary or non-monetary. Non-monetary incentives could include providing information and/or training about how to implement non-structural retrofitting of hazardous materials containment. The Emergency Management Coordinator outlined in M-1 could implement this strategy.

- Provide education and training about non-structural hazards and non-structural retrofitting for facilities containing hazardous materials. Initial focus should be given to facilities on NEHRP D and E Soils.
- Apply for grants that could provide funding for non-structural retrofitting of hazardous materials containment.

**Lead Agency:** Public Works Department

**Funding Source:** Shoreline Operating Budget, Hazards Mitigation Grant Program (HGMP), Pre-Disaster Mitigation Program

**Implementation Cost:** Included in M-2.

**Timeline:** Ongoing

**Associated Hazards:** Earthquakes, Hazardous Materials

**Related Goal and Objective:** Goal 2, Objective 2.2

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**M-15: Create and maintain a partnership between City of Shoreline Emergency Services and Washington State Public Health Laboratories so there is coordination during and immediately after a disaster.**

**Problem/Opportunity:** The Washington State Public Health Laboratories is located on the Fircrest campus. The lab has a fairly sizeable number, but in small quantities, of individual chemicals. During a disaster, especially earthquake, chemicals may be accidentally released and can cause harm to the surrounding population and environment.

**Implementation Strategy:** The Emergency Management Coordinator outlined in M-1 could implement this strategy.

- Develop a contact person for the City of Shoreline as well as the Washington State Public Health Laboratories so that there is an ongoing dialog between the two agencies.
- Work together on emergency preparedness, response, recovery and mitigation measures so that in the event of a disaster the City of Shoreline Emergency Services and the Washington State Public Health Laboratories can work efficiently together to ensure impacts from the event are reduced.

**Lead Agency:** Police Department

**Funding Source:** Shoreline Operating Budget

**Implementation Cost:** No significant additional cost for Shoreline

**Timeline:** Ongoing

**Associated Hazards:** Earthquakes and Hazardous Materials

**Related Goal and Objective:** Goal 3, Objective 3.1

**M-16: Create and maintain partnerships with educational and care facilities.**

**Problem/Opportunity:** Within the City of Shoreline there are several educational and care facilities that are both publicly and privately operated. By creating a partnership between the City of Shoreline and these facilities there can be coordination in implementing mitigation measures that can reduce the risk to the community.

**Implementation Strategy:** The Emergency Management Coordinator outlined in M-1 could implement this strategy.

- Identify the educational and care facilities within the City of Shoreline.
- Develop a contact person for the City of Shoreline and from these facilities so that there is an ongoing dialog.
- Work together on emergency preparedness, response, recovery and mitigation measures so that in the event of a disaster the City of Shoreline and these facilities can work efficiently together to ensure that impacts from the event are reduced.

**Lead Agency:** Police Department

**Funding Source:** Shoreline Operating Budget

**Implementation Cost:** No significant additional cost for Shoreline

**Timeline:** Ongoing

**Associated Hazards:** All Hazards

**Related Goal and Objective:** Goal 3, Objective 3.1

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**M-17: Institute low impact development regulations for new developments as well as re-development projects.**

**Problem/Opportunity:** Impervious surfaces, such as sidewalks, driveways, or foundations do not allow water to filter through the ground but instead water drains quickly into storm water management systems. This situation increases the risk of flooding and adds sediment and toxins to runoff. Low impact development has the potential to alleviate these adverse impacts through the creation of appropriately placed green space, landscaping, grading, streetscapes, roads and parking lots. Low impact development can achieve multifunctional objects and help to reduce storm water impacts, and provide and maintain the beneficial hydrologic functions of a natural drainage system.

**Implementation Strategy:** Develop city regulations and guidelines that implement low impact development objectives to:

- Minimize impacts to the extent practicable by reducing imperviousness, conserving natural resources and ecosystems, maintaining natural drainage courses, reducing the use of pipes and minimizing clearing/grading.
- Recreate detention and retention storage so that water is dispersed and evenly distributed throughout a site. This can be done with the use of open swales, gentler slopes, depressions, storage rain gardens (bio-retention), water use (rain barrels) and others.
- Strategically route water flows to maintain predevelopment travel times.

- Provide effective public education and socioeconomic incentives to ensure property owners use effective pollution prevention measures and maintain water management measures.

**Lead Agency:** Planning & Development Services Department

**Funding Source:** Shoreline Operating Budget, Shoreline Capital Improvement Budget

**Implementation Cost:** No significant additional cost to Shoreline.

**Timeline:** Ongoing

**Associated Hazards:** Flooding

**Related Goal and Objective:** Goal 5, Objective 5.1

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**M-18: Create and maintain a partnership between the City of Shoreline and the Shoreline Fire Department so there is coordination in implementing mitigation measures as well as coordination during and immediately after a disaster.**

**Problem/Opportunity:** The Shoreline Fire Department is a special district serving the City of Shoreline. The Shoreline Fire Department is a valuable resource and may be able help implement mitigation measures dealing with wildland fire. The Fire Department also takes part in emergency preparedness, response and recovery. Coordination with the City of Shoreline can ensure impacts from a disaster event are reduced.

**Implementation Strategy:** The Emergency Management Coordinator outlined in M-1 could implement this strategy.

- Develop a contact person for the City of Shoreline as well as the Shoreline Fire Department so that there is an ongoing dialog between the two agencies.
- Work together on emergency preparedness, response, recovery and mitigation measures so that in the event of a disaster the City of Shoreline and the Shoreline Fire Department can work efficiently together to ensure that impacts from the event are reduced.

**Lead Agency:** Police Department

**Funding Source:** Shoreline Operating Budget

**Implementation Cost:** No significant additional cost for Shoreline

**Timeline:** Ongoing

**Associated Hazards:** All Hazards

**Related Goal and Objective:** Goal 3, Objective 3.1

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**M-19: Create and maintain a partnership between the City of Shoreline and the Shoreline School District so there is coordination in implementing mitigation measures as well as coordination during and immediately after a disaster.**

**Problem/Opportunity:** The Shoreline School District is a special district serving the City of Shoreline. By creating a partnership between the City of Shoreline and the Shoreline School District there can be coordination in implementing mitigation measures that can reduce the risk to School District employees

as well as the children who attend the schools. Also, School District Buildings are a valuable resource for disaster shelters and in the past have been utilized as shelters. Creating this partnership can help to reduce the impacts from a disaster event.

**Implementation Strategy:** The Emergency Management Coordinator outlined in M-1 could implement this strategy.

- Develop a contact person for the City of Shoreline as well as the Shoreline School District so that there is an ongoing dialog between the two agencies.
- Work together on emergency preparedness, response, recovery and mitigation measures so that in the event of a disaster the City of Shoreline and the Shoreline School District can work efficiently together to ensure that impacts from the event are reduced.

**Lead Agency:** Police Department

**Funding Source:** Shoreline Operating Budget

**Implementation Cost:** No significant additional cost for Shoreline

**Timeline:** Ongoing

**Associated Hazards:** All Hazards

**Related Goal and Objective:** Goal 3, Objective 3.1

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#### **M-20: Create and maintain a partnership with Snohomish County.**

**Problem/Opportunity:** Snohomish County borders the City of Shoreline to the north. It is important to create and maintain a partnership with Snohomish County so that there is coordination in implementing mitigation measures as well as response, recovery and preparedness. This partnership is especially important because the City of Shoreline provides emergency services to Point Wells, which is located in Snohomish County.

**Implementation Strategy:** The Emergency Management Coordinator outlined in M-1 could implement this strategy.

- Develop a contact person for the City of Shoreline and Snohomish County so that there is an ongoing dialog.
- Work together on emergency preparedness, response, recovery and mitigation measures so that in the event of a disaster the City of Shoreline and Snohomish County can work efficiently together to ensure that impacts from the event are reduced.

**Lead Agency:** Police Department

**Funding Source:** Shoreline Operating Budget

**Implementation Cost:** No significant additional cost for Shoreline

**Timeline:** Ongoing

**Associated Hazards:** All Hazards

**Related Goal and Objective:** Goal 3, Objective 3.1

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**M-21: Reassess the City of Shoreline evacuation and primary response routes.**

**Problem/Opportunity:** The Emergency Operations Plan identifies evacuation and primary response routes. Some of the same roads are used and may cause problems in the event of a disaster. An analysis of other potential routes is needed to ensure that traffic congestion does not impede response efforts during or after a disaster. Additional work may need to be done to roads so that they can serve as an evacuation or primary response route. The Emergency Management Coordinator outlined in M-1 could implement this strategy.

**Implementation Strategy:**

- Reassess the City of Shoreline evacuation and primary response routes.
- Develop new routes where necessary.

**Lead Agency:** Police Department

**Funding Source:** Shoreline Operating Budget

**Implementation Cost:** No significant additional cost for Shoreline

**Timeline:** Short Term

**Associated Hazards:** All Hazards

**Related Goal and Objective:** Goal 4, Objective 4.1

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**M-22: Educate business owners about potential hazards and hazard mitigation.**

**Problem/Opportunity:** Businesses are more than a collection of buildings and inventories. They act as suppliers, customers and have products making up a larger independent business environment. Planning ahead for disasters and developing strong partnerships have enabled businesses to recover from disasters.

**Implementation Strategy:** Develop a business education program to educate business owners about potential hazards and hazard mitigation. The Emergency Management Coordinator outlined in M-1 could implement this strategy. Some measures that should be taken are:

- Secure Chamber of Commerce and business associations' support and elicit active involvement and leadership from the organizations in hazard mitigation planning.
- Research potential business participants and build a database/ mailing list.
- Develop a direct mail/publicity campaign to get businesses' attention.
- Tie information dispersal to business license issuance (new and renewal).
- Distribute guides to businesses and/or post on the city's website.
- Educate businesses about forming partnerships so that businesses can maintain operations after a disaster event.
- Assist and educate businesses about creating resumption plans for after a disaster event.

**Lead Agency:** Police Department

**Funding Source:** Shoreline Operating Budget

**Implementation Cost:** Included in M-2

**Timeline:** Ongoing

**Associated Hazards:** All Hazards

**Related Goal and Objective:** Goal 1, Objective 1.1

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**M-23: Educate private homeowners about how to implement measures to reduce impacts of wildland fires.**

**Problem/Opportunity:** Wildland fire is a hazard that puts structures in the wildland urban interface areas at risk. The city can educate homeowners in the interface areas about what specific steps can be taken to reduce the risk to their homes from wildland fire.

**Implementation Strategy:** Educate private homeowners in the interface areas about measures to reduce risk from wildland fire that are outlined in programs such as Firewise. The Emergency Management Coordinator outlined in M-1 could implement this strategy. Some of these measures are:

- **Survivable Space:** Homeowners can reduce the amount of fuel around a structure that is burnable. The survivable space area around the structure can include gravel pathways, healthy lawns and driveways.
- **Landscaping:** To reduce risk, homeowners can plant species that are acclimated to Northwest Washington and plants that have high moisture content in their leaves. Maintaining a healthy landscape can also reduce risk from wildland fire. Some things that can be done are adequately spacing and pruning plants, removing dead leaves and litter and providing the landscape with sufficient moisture.
- **Roofing Materials:** The choice of roofing material in intermix areas is important in reducing risk from Wildland fire. Some roofing materials such as asphalt or tile are recommended to reduce risk. It is also recommended that wooden shingles and shakes be treated with fire retardant.

To implement this program refer to M-2, which describes the methodology of how to distribute information community wide.

**Lead Agency:** Planning & Development Services Department

**Funding Source:** Shoreline Operating Budget

**Implementation Cost:** Included in M-2

**Timeline:** Ongoing

**Associated Hazards:** Wildland Fire

**Related Goal and Objective:** Goal 1, Objective 1.2

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**M-24: Utilize the most current data and technology to develop a work program to regulate development and re-development on NEHRP E soils.**

**Problem/Opportunity:** NEHRP E soils are susceptible to ground shaking and liquefaction. Structures and infrastructure located on E soils are vulnerable during an earthquake. Regulation of these structures can reduce the risk and loss to the community.

**Implementation Strategy:**

- Require evaluations for new and redevelopment construction on sites that are located on NEHRP E Soils.
- Based on evaluation require implementation of successful earthquake mitigation technologies.

**Lead Agency:** Planning and Development Services

**Funding Source:** Shoreline Operating Budget

**Implementation Cost:** No significant additional cost for Shoreline

**Timeline:** Ongoing

**Associated Hazards:** Earthquakes

**Related Goal and Objective:** Goal 4, Objective 4.2

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**M-25: Target code enforcement of abatement of nuisance vegetation on both City right-of-ways and public property.**

**Problem/Opportunity:** Shoreline Municipal Code 20.30.750 allows for the abatement of nuisance vegetation. Nuisance vegetation includes any trees, plants, shrubs, vegetation or parts thereof that interfere with sidewalks, streets, poles, wires, pipes, fixtures or any other part of any public utility situated in the street as well as shrubs, brush, vines, trees or other vegetation growing or which has grown and died, and organic debris, which constitutes a fire hazard.

In Shoreline, the power lines are above ground and one of the most common reasons for power supply disruptions is trees and other vegetation damaging the lines. Also, high fuel loads are an ignition source for wild fires. Enforcement of the code would reduce the amount of damage to the power lines as well as the potential for wildland fires.

**Implementation Strategy:**

- Evaluate the effectiveness of the current code and ensure that there are no conflicts with other regulation.
- Create a work plan that ensures proper code enforcement of abatement of nuisance vegetation.
- Evaluate vegetation management plans for city properties and ensure that the plans are adequately keeping vegetation clear of power lines and removing vegetation that constitutes a fire hazard.
- Produce an educational pamphlet to give to residents. This would include information about why maintaining vegetation around power lines is important and what vegetation constitutes a fire hazard. It would also include a recommended tree planting guide for areas near power lines.
- Partner with utility provider to ensure that transmission corridors are maintained.

**Lead Agency:** Public Works Department, Planning & Development Services Department

**Funding Source:** Shoreline Operating Budget

**Implementation Cost:** No significant additional cost to Shoreline

**Timeline:** Ongoing

**Associated Hazards:** Severe Storms, Wildland Fire

**Related Goal and Objective:** Goal 2, Objective 2.1

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**M-26: Utilize Geographic Information Systems (GIS) in decision-making processes.**

**Problem/Opportunity:** GIS offers a quick and comprehensive tool to identify problems and opportunities.

**Implementation Strategy:** Utilize GIS software to aid in reducing risk from hazard. This would include educating decision makers about how hazards can be analyzed using GIS. Some of the functions GIS can be used for include:

- Determination of areas of high risk, exposure, coding, retrofitting, and education priorities.
- Planning for road network and utility network expansions
- Evaluating the risk to existing and new developments.
- Update and maintain data so that there is consistency and data coordination among all city departments.

**Lead Agency:** Finance Department

**Funding Source:** Shoreline Operating Budget

**Implementation Cost:** There is no significant additional cost to Shoreline unless additional software is needed. The cost of the additional software cannot be determined at this time.

**Timeline:** Ongoing

**Associated Hazards:** All Hazards

**Related Goal and Objective:** Goal 4, Objective 4.2

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**M-27: Utilize the most current data and technology when regulating landslide areas.**

**Problem/Opportunity:** Landslide hazard areas create risk for the structures, roads and utilities located within these areas. Regulations can help to decrease the risks of landslides by requiring the use of the most current data and technology.

**Implementation Strategy:**

- Require geotechnical evaluations for new construction sites that are located on landslide hazard areas.
- Based on geotechnical evaluations require implementation of successful landslide mitigation technologies.

**Lead Agency:** Planning & Development Services Department

**Funding Source:** Shoreline Operating Budget, Private Developers

**Implementation Cost:** No significant additional cost to Shoreline, Private developer would pay through permitting process

**Timeline:** Ongoing

**Associated Hazards:** Landslides

**Related Goal and Objective:** Goal 2, Objective 2.1

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**M-28: Remove the Robinson Water Tower.**

**Problem/Opportunity:** In November of 2000, the Shoreline Building Official declared the Robinson Water Tower, located at intersection of NW 195<sup>th</sup> and 3<sup>rd</sup> Ave NW, to be a hazardous structure. In the event of an earthquake or a severe storm, the tower could collapse potentially harming people or infrastructure.

**Implementation Strategy:**

- Demolish the Robinson Water Tower

**Lead Agency:** Planning & Development Services Department

**Funding Source:** Shoreline Operating Budget

**Implementation Cost:** Approximately \$17,000

**Timeline:** Short Term

**Associated Hazards:** Earthquake, Severe Weather

**Related Goal and Objective:** Goal 2, Objective 2.1