

Section 5

Mitigation Strategy Requirements

Mitigation Strategy---Requirement §201.6(c)(3):

The plan **shall** include a strategy that provides the jurisdiction's blueprint for reducing the potential losses identified in the risk assessment, based on existing authorities, policies, programs and resources, and its ability to expand on and improve these existing tools.

Local Hazard Mitigation Goals---Requirement §201.6(c)(3)(i):

[The hazard mitigation strategy **shall** include a] description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards.

- Does the new or updated plan include a description of mitigation **goals** to reduce or avoid long-term vulnerabilities to the identified hazards?

Identification and Analysis of Mitigation Actions---Requirement §201.6(c)(3) (ii):

[The mitigation strategy **shall** include a] section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard, with particular emphasis on new and existing buildings and infrastructure.

Identification and Analysis of Mitigation Actions: National Flood Insurance Program (NFIP) Compliance--Requirement §201.6(c)(3)(ii):

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

- Does the new or updated plan identify and analyze a **comprehensive range** of specific mitigation actions and projects for each hazard?
- Do the identified actions and projects address reducing the effects of hazards on **new** buildings and infrastructure?
- Do the identified actions and projects address reducing the effects of hazards on **existing** buildings and infrastructure?
- Does the new or updated plan describe the jurisdiction(s) participation in the NFIP?
- Does the mitigation strategy identify, analyze and prioritize actions related to continued compliance with the NFIP?

Implementation of Mitigation Actions---Requirement: §201.6(c)(3) (iii):

[The mitigation strategy section **shall** include] an action plan describing how the actions identified in section (c)(3)(ii) will be prioritized, implemented, and administered by the local jurisdiction. Prioritization **shall** include a special emphasis on the extent to which benefits are maximized according to a cost benefit review of the proposed projects and their associated costs.

- Does the new or updated mitigation strategy include how the actions are **prioritized**? (For example, is there a discussion of the process and criteria used?)
- Does the new or updated mitigation strategy address how the actions will be **implemented and administered**, including the responsible department, existing and potential resources and the timeframe to complete each action?
- Does the new or updated prioritization process include an emphasis on the use of **cost-benefit review** to maximize benefits?
- Does the updated plan identify the completed, deleted or deferred mitigation actions as a benchmark for progress, and if activities are unchanged (i.e., deferred), does the updated plan describe why no changes occurred?

SECTION 5

REGION 5 ALL HAZARD MITIGATION PLAN 2015-2020 EDITION MITIGATION STRATEGY

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Table 5-1 Pierce County Mitigation Strategy Matrix

Implementation Mechanism	Mitigation Measure (<i>Hazard(s)</i>) ¹	Lead Jurisdiction(s) / Department(s)	Timeline (years)	Plan Goals					
				Life and Property	Operations Community	Partnerships	Natural Resources	Preparedness	Sustainable Economy
Startup	1. Existing Mitigation Actions (<i>E,L,V,D,F,WUI,SW,MM</i>)	PC DEM; Local Jurisdictions	Ongoing	✓	✓	✓	✓	✓	✓
	2. Plan Maintenance (<i>E,L,V,D,F,WUI,SW,MM</i>)	PC DEM; Local Jurisdictions	Ongoing	✓	✓	✓	✓	✓	✓
HMF	3. Pierce County Hazard Mitigation Forum (<i>E,L,T,V,D,F,WUI,SW, MM</i>)	PC DEM; Local Jurisdictions	Ongoing	✓	✓	✓	✓	✓	✓
Emergency Management and Local Jurisdictions	1. Underground Utilities (<i>All</i>)	PC DEM; Local Utility Providers	Ongoing	✓	✓	✓			✓
	2. Retrofit of Lower Puyallup Levee System (<i>F</i>)	Local Jurisdictions	Ongoing	✓	✓	✓	✓	✓	✓
	3. Fire District Annexations (<i>WUI</i>)	PC DEM; Local Jurisdictions	Ongoing	✓	✓	✓	✓	✓	✓
	4. Develop Firewise Communities (<i>WUI</i>)	PC DEM; Local Jurisdictions	Ongoing	✓	✓	✓	✓	✓	✓
Emergency Management	1. Hazard Mitigation Committee (<i>All</i>)	PC DEM	Ongoing	N/A					
	2. All Hazards Mitigation Plan (<i>All</i>)	PC DEM	Ongoing	N/A					
	3. Continuity of Government Plan (<i>All</i>)	PC DEM	Ongoing		✓	✓			✓
	4. Disaster Recovery Plan (<i>All</i>)	PC DEM	Ongoing		✓	✓			✓
	5. NOAA All-Hazards Program (<i>All</i>)	PC DEM	Ongoing	✓	✓			✓	
	6. Natural Hazard Insurance Information (<i>All</i>)	PC DEM; Insurance Industry	Ongoing	✓		✓		✓	✓
Emergency Management Public Education	1. Public Education: Severe Weather (<i>SW</i>)	PC DEM	Ongoing	✓				✓	
	2. Public Education: Lahar (<i>V</i>)	PC DEM	Ongoing	✓				✓	
	3. Public Education: Volcanic Ashfall (<i>V</i>)	PC DEM	Ongoing	✓				✓	
	4. Public Education: Evacuation Routes (<i>V</i>)	PC DEM	Ongoing	✓				✓	
	5. Public Education: Pierce County Neighborhood Emergency Teams (<i>All</i>)	PC DEM	Ongoing	✓	✓	✓	✓	✓	✓
	6. Public Education Campaigns: All Hazards (<i>All</i>)	PC DEM	Ongoing	✓				✓	✓
	7. Public Education Campaigns: Post-Disaster, All Hazards (<i>All</i>)	PC DEM	Ongoing	✓				✓	✓

Implementation Mechanism	Mitigation Measure (<i>Hazard(s)</i>) ¹	Lead Jurisdiction(s) / Department(s)	Timeline (years)	Plan Goals					
				Life and Property	Operations Community	Partnerships	Natural Resources	Preparedness	Sustainable Economy
<u>Facilities Management</u>	1. Critical Infrastructure: Access Limitation Evaluation (<i>All</i>)	Facilities Management; PC DEM	Ongoing	N/A					
	2. Pierce County Human Services South Bldg.: Nonstructural Retrofit (<i>All</i>)	Facilities Management	Ongoing	✓	✓				
	3. Volcanic Hazards Response and Recovery Standard Operating Procedures (<i>V</i>)	Facilities Management	Ongoing	✓	✓				
<u>Public Works & Utilities</u>	1. FEMA Flood Insurance Rate Maps (<i>F</i>)	Surface Water Management Programs	Ongoing	✓			✓	✓	✓
	2. Channel Migration Zone Mapping (<i>F</i>)	Surface Water Management Programs	Ongoing	✓			✓	✓	✓
	3. Levee System: Facility Assessment Plan Development (<i>E, V, LS</i>)	Surface Water Management Programs	1 year	✓	✓				
	4. Setback Levees (<i>F</i>)	Surface Water Management Programs	Ongoing	✓			✓		✓
	5. Protection of critical Facilities and Infrastructure (<i>F</i>)	Surface Water Management Programs	Ongoing	✓	✓		✓		
	6. Preventative Maintenance: Flood Control Infrastructure (<i>F</i>)	Surface Water Management Programs	Ongoing	✓	✓		✓		
	7. Repetitive Flood Loss Properties (<i>F</i>)	Surface Water Management Programs	Ongoing	✓				✓	✓
	8. New Construction: Flood Control Infrastructure (<i>F</i>)	Surface Water Management Programs	Ongoing	✓	✓		✓	✓	✓
	9. Surface Water Management Programs Emergency Response Management Plan (<i>F</i>)	Surface Water Management Programs	Ongoing	✓	✓	✓			
	10. Purdy Road Shop: Develop Program to Place Utilities Underground (<i>E, F, SW, MM</i>)	Road Operations Division	Ongoing	✓	✓				
	11. Bridge Retrofit Program (<i>All</i>)	Transportation Division	Ongoing	✓	✓				✓
	12. Bridge for Kids (<i>All</i>)	PWU; City or Orting; PC DEM; B4K with Orting School Dist.	Ongoing	✓				✓	

Implementation Mechanism	Mitigation Measure (<i>Hazard(s)</i>) ¹	Lead Jurisdiction(s) / Department(s)	Timeline (years)	Plan Goals					
				Life and Property	Community Operations	Partnerships	Natural Resources	Preparedness	Sustainable Economy
	13. Evacuation Planning: New Roads and Development (<i>All</i>)	Transportation Division; PC DEM	Ongoing	✓	✓				
	14. Elevation of 192 nd St East above Flood Elevation (<i>F</i>)	PC PWU & Transportation; Port of Tacoma	Ongoing	✓	✓				✓
	15. Protection of Road Corridors from Channel Migration Hazards (<i>F</i>)	PWU	Ongoing	✓				✓	
	16. Facility Security Enhancements (<i>All</i>)	Sewer Division; PC Security	N/A	✓					
	17. Security Plan and Security Investments for Wastewater Treatment Plant (<i>All</i>)	Sewer Division; PC Security	Ongoing	✓			✓		
	18. Spill Containment Procedures and Structures at the wastewater Treatment Plant (<i>MM</i>)	Sewer Division	2 years	✓	✓		✓		
	19. Spill Containment and Recovery Measures for Sewer Pipeline Failures (<i>MM</i>)	Sewer Division	Ongoing	✓			✓		
	20. Continuity of Operations measures (<i>All</i>)	Sewer Division	Ongoing	✓			✓		
	21. Rehabilitate Sewer System Manholes for longevity and Structural Integrity (<i>All</i>)	Sewer Division	Ongoing	✓	✓				
	22. Parkland/Brookdale Sewer Main Replacement (<i>E, MM</i>)	Sewer Division	20+ years		✓		✓		
<u>PWU Public Education</u>	1. Public Education: Flood (<i>F</i>)	Surface Water Management Programs (PC PWU); PC DEM	Ongoing		✓		✓		
<u>Community Services</u>	1. Tree Maintenance Program (<i>SW, WUI</i>)	PC DEM; Cooperative Extension (PC Community Services)	Ongoing	✓	✓		✓	✓	✓
<u>Economic Development</u>	1. Pre-Disaster Business Mitigation Loan Program (<i>All</i>)	SBA with PC DEM; PC Chambers of Commerce; PC Economic Development; PC Historically Underutilized Businesses Program (HUB)	Ongoing	✓		✓			✓
<u>Information</u>	1. Information Technology: Essential Records Protection (<i>All</i>)	Tacoma Public Works-BLUS	Ongoing		✓				

Implementation Mechanism	Mitigation Measure (<i>Hazard(s)</i>) ¹	Lead Jurisdiction(s) / Department(s)	Timeline (years)	Plan Goals					
				Life and Property	Operations Continuity	Partnerships	Natural Resources	Preparedness	Sustainable Economy
<u>Technology</u>	2. Pierce County Information Technology Department Fiber Ring (<i>All</i>)	PC IT	Ongoing		✓				
<u>Planning and Land Services</u>	1. Tsunami Critical Area Regulation (<i>F, T</i>)	PC PALS; PC DEM; Surface Water Management Programs (PC PWU)	Ongoing	N/A					
<u>Pierce County Sheriff</u>	1. Infrastructure: Response Considerations (<i>All</i>)	Pierce County Sheriff's Department; Fire Districts	Ongoing	N/A					
	2. Pierce County Sheriff Peninsula Detachment: Back-up system for loss of system and sewer (<i>All</i>)	PC Facilities Management	Ongoing	✓	✓				
	3. Pierce County Sheriff Peninsula Detachment Nonstructural Retrofit (<i>E</i>)	PC Facilities Management	Ongoing	✓	✓				
	4. Sheriff South Hill Precinct: Nonstructural Retrofit (<i>E</i>)	PC DEM	Ongoing	✓				✓	

Startup Mitigation Measures

Existing Mitigation Actions

Hazards: E, L, V, D, F, WUI, SW¹, MM²

Pierce County will integrate the hazard mitigation plan into existing plans, ordinances, and programs to dictate land uses within the jurisdiction. Further, Pierce County will continue to implement existing programs, policies, and regulations as identified in the Capability Identification Section of this Plan. This includes such actions as updating the Critical Area Regulations and any ensuing land use policies with best available science. It also includes continuing those programs that are identified as technical capabilities.

1. **Goal(s) Addressed** = Protect Life and Property; Promote A Sustainable Economy; Ensure Continuity of Operations; Increase Public Preparedness for Disasters; Preserve or Restore Natural Resources; Establish and Strengthen Partnerships for Implementation.
2. **Cost of Measure** = TBD
3. **Funding Source and Situation** = Funding could be accomplished with local budgets or grants.
4. **Lead Department(s)** = PC DEM
5. **Timeline** = Ongoing
6. **Benefit** = City-Wide
7. **Life of Measure** = Perpetual
8. **Community Reaction** = the proposal is likely to be endorsed by the entire community.

Plan Maintenance

Hazards: E, L, V, D, F, WUI, SW¹, MM

P will adopt those processes outlined in the Plan Maintenance Section of this Plan.

1. **Goal(s) Addressed** = Protect Life and Property; Promote A Sustainable Economy; Ensure Continuity of Operations; Increase Public Preparedness for Disasters; Preserve or Restore Natural Resources; Establish and Strengthen Partnerships for Implementation.
2. **Cost of Measure** = TBD
3. **Funding Source and Situation** = Funding could be obtained through local budget.
4. **Lead Department(s)** = PC DEM
5. **Timeline** = Ongoing
6. **Benefit** = City-Wide
7. **Life of Measure** = Perpetual
8. **Community Reaction** = The proposal is likely to be endorsed by the entire community.

Hazard Mitigation Forum

Pierce County Hazard Mitigation Forum

Hazards: E, L, T, V, D, F, WUI, SW¹, MM

The County will continue to maintain the Pierce County Hazard Mitigation Forum. The Forum will continue as a means of coordinating mitigation planning efforts among all jurisdictions within the County that have completed a mitigation plan. This ensures efficient use of resources and a more cooperative approach to making a disaster resistant county. The HMF meets annually; every October. This is addressed in the Plan Maintenance Section of this Plan.

1. **Goal(s) Addressed** = Protect Life and Property; Promote A Sustainable Economy; Ensure Continuity of Operations; Increase Public Preparedness for Disasters; Preserve or Restore Natural Resources; Establish and Strengthen Partnerships for Implementation.
 2. **Cost of Measure** = Minor
 3. **Funding Source and Situation** = Funding could be obtained through local budget.
 4. **Lead Department(s)** = PC DEM
 5. **Timeline** = Ongoing
 6. **Benefit** = County-Wide
 7. **Life of Measure** = Perpetual
 8. **Community Reaction** = The proposal is likely to be endorsed by the entire community.
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Underground Utilities

Hazards: All

The County will continue to encourage the placement of all utilities (i.e., power lines) underground. This will limit the potential damage to infrastructure as well as the damage that infrastructure could cause to life and property. Events like the windstorm of February 2006 and December 2006 where power lines were down all over the County show the viability of this measure. Where this is not economically feasible for the utility provider, homeowners could have the option to have their utilities placed underground through an individualized rate structure.

1. **Goal(s) Addressed** = Protect Life and Property; Promote A Sustainable Economy; Ensure Continuity of Operations; Establish and Strengthen Partnerships for Implementation
 2. **Cost of Measure** = Varies
 3. **Funding Source and Situation** = Funding could be obtained through local budget.
 4. **Lead Department(s)** = PC DEM; Local utility providers
 5. **Timeline** = Long-term
 6. **Benefit** = County-Wide
 7. **Life of Measure** = Varies
 8. **Community Reaction** = The proposal would be somewhat controversial.
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Retrofit of Lower Puyallup Levee System

Hazards: F

The County will coordinate with other jurisdictions on the flood retrofit of the Lower Puyallup Levee System through the Pierce County Flood Control Zone District Advisory Board. The Flood Control Zone District has partnered with the United States Army Corps of Engineers (USACE) on a General Investigation for the Puyallup River basin. Levee studies conducted in 2007 – 2008 indicate the levees are generally structurally sound and in reasonably good condition. However, this system was built in the early 1900's under prior construction standards which did not include adequate free board under today's standards. Freeboard as defined by FEMA at three feet above the 100-year flood event elevations. Lack of free board made the levees ineligible for accreditation by the Federal Emergency Management Agency (FEMA). This de-accreditation resulted in changes to FEMA's flood plain maps and new flood plain designations and restrictions along the Puyallup River. Given the value of the commercial, industrial and residential land this levee system protects, Pierce County believes there is regional consensus on the need to increase flood protection along this segment of the river. The Pierce County Rivers Flood Hazard Management Plan, 2013 advocates for increasing the level of flood protection from 100- year to a 200-year level of service. Pierce County has historically been responsible for maintaining the levee system along the Puyallup River. Recent flood events in November 2006, November 2008, and January 2009, provide a further impetus to move this long-term project along for the greater sustainability of Pierce County.

1. **Goal(s) Addressed** = Protect Life and Property; Promote A Sustainable Economy; Ensure Continuity of Operations; Establish and Strengthen Partnerships for Implementation; Increase Public Preparedness; Protect the Environment
2. **Cost of Measure** = Estimated \$150 Million
3. **Funding Source and Situation** = Funding could be obtained through local budgets.
4. **Lead Department(s)** = Puyallup River Executive Task Force; Federal Jurisdictions; State Jurisdictions; Tribal Jurisdictions; Local Jurisdictions
5. **Timeline** = Long-term
6. **Benefit** = County-Wide
7. **Life of Measure** = Perpetual
8. **Community Reaction** = The proposal would be somewhat controversial.

Fire District Annexations

Hazards: WUI

The County will continue to encourage rural residents to annex to local fire districts. This will transfer fire response capabilities to local control and increase funds available for firefighting services at the local level. In some areas residents have not annexed to their local fire districts and instead are served by the Department of Natural Resources. Washington State law provides that annexations may occur by petition when the owners of 60% of the assessed valuation of the

annexation area submit a petition that is subsequently approved by the Board of Fire Commissioners. One example of this is the annexation of Pierce County Fire Districts 12 and 20 with East Pierce County Fire District 22.

1. **Goal(s) Addressed** = Protect Life and Property; Promote A Sustainable Economy; Ensure Continuity of Operations; Establish and Strengthen Partnerships for Implementation; Increase Public Preparedness; Protect the Environment
2. **Cost of Measure** = Staff time and materials
3. **Funding Source and Situation** = Funding could be obtained through local budget or grants
4. **Lead Department(s)** = Local fire districts; WA Department of Natural Resources; Fire Prevention Bureau (PC DEM)
5. **Timeline** = Long-term
6. **Benefit** = County-Wide
7. **Life of Measure** = Perpetual
8. **Community Reaction** = The proposal would be somewhat controversial.

Develop Firewise Communities

Hazards: WUI

The County will continue to expand upon Firewise training by planning and carrying out Firewise workshops in high hazard areas of Pierce County in collaboration with local fire districts, homeowners, developers, and others. Each workshop will result in a local action plan for homeowners, fire safety professionals, land use planners, and others. The National WUI Fire Program created this innovative mitigation program so that communities and individuals can learn how to recognize, evaluate and mitigate the Wildland/Urban Interface fire dangers in their communities. The workshops gather private and public sector citizens including architects, bankers, fire marshals, insurance representatives, realtors and property owners for a two-day mitigation exercise in which participants review a case study community, identify hazards, resolve conflicting interests and develop a mitigation plan. This program is already being tried in Pierce County by South Pierce Fire District 17.

1. **Goal(s) Addressed** = Protect Life and Property; Promote A Sustainable Economy; Ensure Continuity of Operations; Establish and Strengthen Partnerships for Implementation; Increase Public Preparedness; Protect the Environment
2. **Cost of Measure** = Varies
3. **Funding Source and Situation** = Funding could be obtained through local budget.
4. **Lead Department(s)** = PC DEM; Local utility providers
5. **Timeline** = Long-term
6. **Benefit** = County-Wide
7. **Life of Measure** = Varies
8. **Community Reaction** = The proposal would be somewhat controversial.

Emergency Management –Mitigation Measures

Hazard Mitigation Committee

Hazards: All

The County will continue the coordination of the Pierce County Hazard Mitigation Committee (HMC). The HMC functions as a means of coordinating, evaluating, and updating mitigation planning efforts among County departments with mitigation capabilities. This ensures efficient use of resources and a more cooperative approach to making a disaster resilient county. The HMC will meet annually to coincide with the normal County budgetary processes. This is addressed in the Plan Maintenance Section of this Plan.

1. **Goal(s) Addressed** = N/A. Goals addressed are contingent upon the mitigation measures resulting from this priority.
2. **Cost of Measure** = Cost of meeting room, refreshments and documentation
3. **Funding Source and Situation** = Funding could be obtained through local budget.
4. **Lead Department(s)** = PC DEM
5. **Timeline** = Long-term
6. **Benefit** = County-Wide
7. **Life of Measure** = Perpetual
8. **Community Reaction** = The proposal is likely to be endorsed by the entire community.

All-Hazards Mitigation Plan

Hazards: All

The County will continue to develop an All-Hazards Mitigation Plan as an expansion of this Plan. Based on recent guidance and best practices from the Emergency Management Accreditation Program and the Department of Homeland Security the County will build the 2009 Addendum. Combining human-caused hazards and terrorism threat assessments with this Plan will result in a more complete analysis of the County’s vulnerabilities and mitigation strategies. In doing so, duplications of mitigation measures can be reduced and a more comprehensive prioritization of projects be achieved. Consolidating this information into one document will allow decision makers and those involved in the four phases of emergency management to better coordinate resources and eliminate duplication in efforts to reduce vulnerabilities and respond to and recover from disasters.

1. **Goal(s) Addressed** = N/A/ Goals addressed are contingent upon the mitigation measures resulting from this priority.
2. **Cost of Measure** = Staff time and materials for plan development
3. **Funding Source and Situation** = Funding could be obtained through local budget or grants.
4. **Lead Department(s)** = PC DEM
5. **Timeline** = Long-term

6. **Benefit** = County-Wide
7. **Life of Measure** = Perpetual
8. **Community Reaction** = The proposal would be somewhat controversial.

Continuity of Government Plan

Hazards: All

The County will continue with its current effort of Continuity of Operations Planning with all County Departments and Agencies. Their efforts are summarized and then added to the Continuity of Government (COG) Plan as a matrix. COG is the capability to ensure survivability of constitutional and democratic government and the continuity of essential government functions. This is vital to all phases of emergency management including hazard mitigation. By establishing baselines of what services have to be provided, with what personnel, at what locations, and with proper resources, the County can refine what is essential and provide more guidance in hazard mitigation measures.

1. **Goal(s) Addressed** = Promote A Sustainable Economy; Ensure Continuity of Operations; Establish and Strengthen Partnerships for Implementation
2. **Cost of Measure** = Varies
3. **Funding Source and Situation** = Funding could be obtained through local budget.
4. **Lead Department(s)** = PC DEM;
5. **Timeline** = Long-term
6. **Benefit** = County-Wide Services
7. **Life of Measure** = Perpetual
8. **Community Reaction** = The proposal would be somewhat controversial.

Disaster Recovery Plan

Hazards: All

The County will develop a comprehensive Disaster Recovery Plan. This will be a pre-event plan for post-disaster recovery and reconstruction, composed of policies, plans, actions and responsibilities. It will include an element of business resumption and long-term economic sustainability. There will be an emphasis on the transition of recovery to mitigation and the synergy of these two phases of emergency management.

1. **Goal(s) Addressed** = Promote A Sustainable Economy; Ensure Continuity of Operations; Establish and Strengthen Partnerships for Implementation;
2. **Cost of Measure** = Varies
3. **Funding Source and Situation** = Budget-Development costs
4. **Lead Department(s)** = PC DEM is coordinating every other department in the County on this plan
5. **Timeline** = Long-term
6. **Benefit** = County-Wide
7. **Life of Measure** = Perpetual

8. **Community Reaction** = The proposal would be somewhat controversial.
-

NOAA All-Hazards Program

Hazards: All

The County will expand on its current program in order that all residents of the valleys, and eventually all residents in the County, will have access to ownership of All Hazards Radios. The County will also install NOAA All Hazards Radios in all County government facilities and train County employees in the radio's use. NOAA Weather Radio, in conjunction with the Federal Communication Commission's (FCC) Emergency Alert System, is an "all hazards" radio network, making it the single source for the most comprehensive weather and emergency information available to the public. NOAA All Hazards Radio also broadcasts warning and post-event information for all types of hazards—both natural (such as earthquake and volcano activity) and environmental (such as chemical releases or oil spills).

1. **Goal(s) Addressed** = Protect Life and Property; Ensure Continuity of Operations; Increase Public Preparedness
 2. **Cost of Measure** = Government Facilities: \$50,000. County-Wide: TBD
 3. **Funding Source and Situation** = Funding could be obtained through local budget or grants.
 4. **Lead Department(s)** = PC DEM
 5. **Timeline** = Long-term
 6. **Benefit** = County-Wide
 7. **Life of Measure** = Life of Unit
 8. **Community Reaction** = The proposal likely to be endorsed by the entire community.
-

Natural Hazard Insurance Information

Hazards: All

The County will partner with the WA Office of Insurance Commissioner to help increase public awareness of natural hazard insurance options and the benefits of carrying various hazard insurance. This will entail dissemination of a FAQ list regarding hazard insurance topics.

1. **Goal(s) Addressed** = Protect Life and Property; Promote A Sustainable Economy; Establish and Strengthen Partnerships for Implementation; Increase Public Preparedness
 2. **Cost of Measure** = Minor – Staff time for meetings and cost of literature
 3. **Funding Source and Situation** = Funding could be obtained through local budget or grants.
 4. **Lead Department(s)** = PC DEM and the Insurance industry.
 5. **Timeline** = Short-term
 6. **Benefit** = County-Wide
 7. **Life of Measure** = Pilot (perpetual)
 8. **Community Reaction** = The proposal is likely to be endorsed by the entire community.
-

Public Education: Severe Weather

Hazards: SW

Pierce County will continue education programs relating to winter preparedness as part of their preparedness education program. These programs will be expanded to include information on such topics as protecting a home from damage from falling branches, generator use, and in some cases will target those areas identified as having the greatest potential wind loading. This will be incorporated into the Pierce County Neighborhood Emergency Team (PC NET) program.

1. **Goal(s) Addressed** = Protect Life and Property; Increase Public Preparedness
2. **Cost of Measure** = Staff time and materials
3. **Funding Source and Situation** = Funding could be obtained through local budget or grants.
4. **Lead Department(s)** = PC DEM
5. **Timeline** = Ongoing
6. **Benefit** = County-Wide
7. **Life of Measure** = Continuous
8. **Community Reaction** = The proposal is likely to be endorsed by the entire community.

Public Education: Lahar

Hazards: V

The County will continue public education programs for all valleys of the County directly threatened by lahars. The following education and awareness options for the inundation areas will be pursued to varying degrees in each of the valleys.

- Vulnerability Information
 - Evacuation Planning
 - Siren Information
 - Radio Warning Information
 - NOAA All-Hazards Radio Training
 - Teacher Training on Hazards
1. **Goal(s) Addressed** = Protect Life and Property; Increase Public Preparedness
 2. **Cost of Measure** = Varies depending on program
 3. **Funding Source and Situation** = Funding could be obtained through local budget or grants.
 4. **Lead Department(s)** = PC DEM
 5. **Timeline** = Ongoing
 6. **Benefit** = County-Wide (Especially Carbon, Nisqually, Puyallup, and White River Valleys)
 7. **Life of Measure** = Continuous
 8. **Community Reaction** = The proposal would benefit those affected, with no adverse reaction from others.

Public Education: Volcanic Ashfall

Hazards: V

The County will continue to expand on its ashfall preparedness and education module stressing individual preparedness for tephra events. The result is to limit structural damage to buildings, limit damage to vehicles, engines and buildings air intake systems, and decrease respiratory problems in the general population from ash inhalation (i.e., distribute masks).

1. **Goal(s) Addressed** = Protect Life and Property; Increase Public Preparedness
2. **Cost of Measure** = Varies
3. **Funding Source and Situation** = Funding could be obtained through local budget or grants.
4. **Lead Department(s)** = PC DEM
5. **Timeline** = Long-term
6. **Benefit** = County-Wide
7. **Life of Measure** = Continuous
8. **Community Reaction** = The proposal is likely to be endorsed by the entire community.

Public Education: Evacuation Routes

Hazards: V

The County will continue to pursue the placement of lahar evacuation route maps in all phone books as a means of public education and a standard response aid.

1. **Goal(s) Addressed** = Protect Life and Property; Increase Public Preparedness
2. **Cost of Measure** = Minor
3. **Funding Source and Situation** = Funding could be obtained through local budget or grants.
4. **Lead Department(s)** = PC DEM
5. **Timeline** = Short-term
6. **Benefit** = County-Wide (Especially Carbon, Nisqually, Puyallup, and White River Valleys)
7. **Life of Measure** = Perpetual
8. **Community Reaction** = The proposal is likely to be endorsed by the entire community.

Pierce County Neighborhood Emergency Teams

Hazards: All

The County will continue to work with neighborhoods to create Pierce County Neighborhood Teams (PC NETs). The County will work to secure funding for the continued operation of the PC NET program.

PC NET is a neighborhood-oriented approach to emergency preparedness and homeland security. It is based on the belief that a cooperative effort between a county and its citizens is the only sure way to protect a neighborhood and to prepare for a major disaster. The program helps individuals and their neighborhoods prepare to mutually assist each other so that lives can be saved, property can be spared, and emergency services can be freed to respond to the most devastated areas. This is accomplished by organizing block groups into a variety of disaster response teams, each of which has a simple one-page list that clearly outlines necessary tasks. No special skills or equipment are required to participate – and only a minimal time commitment is needed. Such programs are critical to reminding the public of the hazards in Pierce County, and of the necessity of having on hand the supplies and materials to survive independently for a minimum of one week. There are currently almost 500 PC Net communities in Pierce County. These programs will be continued and will be expanded upon.

1. **Goal(s) Addressed** = Protect Life and Property, Promote A Sustainable Economy; Ensure Continuity of Operations; Establish and Strengthen Partnerships for Implementation; Increase Public Preparedness; Protect the Environment
2. **Cost of Measure** = Cost for supplies, materials and staff time
3. **Funding Source and Situation** = Funding could be obtained through a federal or state mitigation grant.
4. **Lead Department(s)** = PC DEM
5. **Timeline** = Ongoing
6. **Benefit** = County-Wide
7. **Life of Measure** = Varies
8. **Community Reaction** = The proposal is likely to be endorsed by the entire community.

Public Education Campaigns: All Hazards

Hazards: All

The County will continue to deliver public education campaigns many times throughout the year to audiences ranging from preschoolers to senior citizens, on topics from appropriate use of 911 to organizing communities for disaster response such as the Pierce County Neighborhood Emergency Team (PC NET) project. In general these programs focus on preparing citizens to prepare for and respond to disasters. Such programs are critical to reminding the public of the natural hazards in Pierce County, and of the necessity of having on hand the supplies and materials to survive independently for a minimum of one week. These programs will be continued and be expanded upon.

1. **Goal(s) Addressed** = Protect Life and Property; Promote A Sustainable Economy; Increase Public Preparedness
2. **Cost of Measure** = Varies
3. **Funding Source and Situation** = Funding could be obtained through local budget or grants or a federal or state mitigation grant.
4. **Lead Department(s)** = PC DEM
5. **Timeline** = Ongoing
6. **Benefit** = County-Wide
7. **Life of Measure** = Varies
8. **Community Reaction** = The proposal is likely to be endorsed by the entire community.

Public Education Campaigns: Post-Disaster, All Hazards

Hazards: All

The County will expand on its current post-disaster public education campaigns. These campaigns will speak specifically to the previously occurring disaster, and will focus on at-risk and affected areas. This campaign will work in conjunction with the FEMA post-disaster public education efforts to ensure that local needs and issues are addressed. This will be an element of the recovery plan.

1. **Goal(s) Addressed** = Protect Life and Property; Promote A Sustainable Economy; Increase Public Preparedness
2. **Cost of Measure** = Varies
3. **Funding Source and Situation** = Funding could be obtained through local budget or grants.
4. **Lead Department(s)** = PC DEM
5. **Timeline** = Ongoing
6. **Benefit** = County-Wide
7. **Life of Measure** = Varies
8. **Community Reaction** = The proposal is likely to be endorsed by the entire community.

Facilities Management – Mitigation Measures

Critical Infrastructure: Access Limitation Evaluation

Hazards: All

The County will continue to evaluate critical facilities to determine what infrastructure requires access limitations for security purposes. The County will take the necessary steps to provide access limitation security to those facilities. This will occur in accordance with the FEMA 426 planning recommendations.

1. **Goal(s) Addressed** = Protect Life and Property
2. **Cost of Measure** = Cost of study and equipment
3. **Funding Source and Situation** = Funding could be obtained through local budget or grants.
4. **Lead Department(s)** = PC DEM; PC Facilities Management
5. **Timeline** = Short-term
6. **Benefit** = Facility Specific, County-Wide Services
7. **Life of Measure** = Life of equipment or policy
8. **Community Reaction** = The proposal is likely to be endorsed by the entire community.

Pierce County Human Services South Bldg.: Nonstructural Retrofit

Hazards: All

The Pierce County Human Services Bldg. will undergo a nonstructural seismic retrofit including: securing and bracing HVAC, lighting, ductwork, and ceiling systems. This is a multiple year project due to the amount of work and the project costs related to available funding sources.

1. **Goal(s) Addressed** = Protect Life and Property; Ensure Continuity of Operations
2. **Cost of Measure** = \$2,000,000
3. **Funding Source and Situation** = Future Remodeling Budgets. Funding could be obtained through local budget or grants.
4. **Lead Department(s)** = PC Facilities Management
5. **Timeline** = Long-term
6. **Benefit** = Pierce County Human Services Employees, and de facto the citizens of Pierce County
7. **Life of Measure** = 30 Years
8. **Community Reaction** = The proposal would benefit those affected, with no adverse reaction from others.

Volcanic Hazard Response and Recovery Standard Operating Procedures

Hazards: V

If a volcanic eruption blanketed the area with ash, multiple infrastructures in the County would immediately institute cleanup procedures to prevent infrastructure damage to the roof and HVAC system. This measure would develop those measures for cleanup and identify needed resources. The infrastructure identified include: Pierce County Jail (old), Pierce County Jail (new), Remann Hall, Pierce County Human Services South Building, Law Enforcement Support Agency, County/City Building, Medical Examiners Building, Pierce County Sheriff South Hill Precinct, Pierce County Sheriff Peninsula Detachment, and 2501 Building.

1. **Goal(s) Addressed** = Protect Life and Property; Ensure Continuity of Operations
 2. **Cost of Measure** = Varies
 3. **Funding Source and Situation** = Annual Operating Budget. Funding could be obtained through local budget or grants.
 4. **Lead Department(s)** = PC Facilities Management
 5. **Timeline** = Long-term
 6. **Benefit** = Infrastructure Specific; County-Wide
 7. **Life of Measure** = Life of Infrastructure
 8. **Community Reaction** = The proposal would benefit those affected, with no adverse reaction from others.
-

Public Works and Utilities – Mitigation Measures

FEMA Flood Insurance Rate Maps

Hazards: F

The County will continue to work with FEMA as a Cooperating Technical Partner (CTP) in updating the countywide Digital Flood Insurance Rate Maps (DFIRM) and Flood Insurance Study to replace the effective maps issued in 1987. This leads to more accurate implementation of floodplain regulations and an opportunity to increase public awareness. Pierce County seeks to update flood studies and flood plain maps for the Nisqually River, the lower and upper White River and Greenwater River and incorporate the results into the DFIRM.

1. **Goal(s) Addressed** = Protect Life and Property; Increase Public Preparedness; Protect the Environment; Promote A Sustainable Economy
2. **Cost of Measure** = Cost for information and maps, staff time
3. **Funding Source and Situation** = FEMA Map Modernization Program.
4. **Lead Department(s)** = Surface Water Management Programs (PC PWU) with FEMA
5. **Timeline** = Ongoing
6. **Benefit** = County-Wide
7. **Life of Measure** = Life of Flood Insurance Program
8. **Community Reaction** = The proposal is likely to be endorsed by the entire community.

Channel Migration Zone Mapping

Hazards: F

Pierce County experiences two major types of hazards associated with flooding; flood inundation and channel migration. FEMA publishes the DFIRM which shows areas at risk for inundation, but FEMA has not developed an erosion-prone map for areas at risk of channel migration. The County will continue to work to develop and adopt channel migration maps for all its major rivers. Pierce County seeks to develop maps for Greenwater River, upper White River, middle Nisqually River and the Mashel River.

1. **Goal(s) Addressed** = Protect Life and Property; Increase Public Preparedness; Protect the Environment; Promote A Sustainable Economy
2. **Cost of Measure** = Cost for information and maps, staff time
3. **Funding Source and Situation** =
4. **Lead Department(s)** = Surface Water Management Programs (PC PWU)
5. **Timeline** = Ongoing
6. **Benefit** = County-Wide
7. **Life of Measure** = perpetual
8. **Community Reaction** = The Proposal is likely to be endorsed by the entire community once properly educated

Levee system: Facility Assessment Plan Development

Hazards: E, V, LS

The entire river levee system needs to be systematically assessed following an earthquake, lahar, or the effected portions after a landslide. Surface Water Management will develop an assessment plan to efficiently use available staff. Assessment should be done as soon as possible after the event, preferably within 24 hours. Measures shall include: training personnel in assessment protocol, collection of facility status information, notification of EOC of any structure deficiencies & prioritization of needed repairs.

1. **Goal(s) Addressed** = Protect Life and Property; Ensure Continuity of Operations
2. **Cost of Measure** = Minor
3. **Funding Source and Situation** = REET Fund.
4. **Lead Department(s)** = Surface Water Management Division (PC PWU)
5. **Timeline** = Short-term (One year)
6. **Benefit** = Entire area served by the levee system
7. **Life of Measure** = Perpetual
8. **Community Reaction** = The proposal is likely to be endorsed by the entire community.

Setback Levees

Hazards: F

Continue to construct setback levees to increase flood conveyance within the active channel area and manage downstream sediment transport and deposition. Levee setbacks reduce water surface elevations and stream velocity reconnect floodplains, restore natural riverine process, and enhance sediment deposition. Further work should be done to align sites in the Levee Set-Back Feasibility Study to sites that are being considered for flood hazard reduction and fish habitat sustainability.

1. **Goal(s) Addressed** = Protect Life and Property; Promote A Sustainable Economy; Protect the Environment
2. **Cost of Measure** = Engineering studies, permits, equipment, materials, etc.
3. **Funding Source and Situation** = REET Fund, and Private Funding where applicable. Funding could be obtained through local budget or grants.
4. **Lead Department(s)** = Surface Water Management Division (PC PWU)
5. **Timeline** = Long-term
6. **Benefit** = County-Wide
7. **Life of Measure** = Life of levee
8. **Community Reaction** = The proposal is likely to be endorsed by the entire community.

Protection of Critical Facilities and Infrastructure

Hazards: F

Pierce County code requires the location of critical facilities and infrastructure to be outside of the 500-year flood plain unless no feasible alternative exists. For infrastructure and facilities which do not have a feasible alternative location, such as a wastewater treatment plant, alternative protective measures are required. The County will pursue the development of floodwalls and other protective measures for:

- North Levee Road Setback levee – protects the Port of Tacoma and I-5 in addition to other commercial, residential and industrial areas
- Tacoma Wastewater Treatment Plant Flood Wall
- Puyallup Wastewater Treatment Plant Flood Wall
- State Street Floodwall – protects access to the Sumner Wastewater Treatment Plant
- Oxbow Lake Flooding/Sewer Lift Station Protection
- South Prairie Fire Station flood protection
- Mashel River Bridge Scour.

1. **Goal(s) Addressed** = Protect Life and Property; Ensure Continuity of Operations; Protect the Environment
2. **Cost of Measure** = TBD
3. **Funding Source and Situation** = County’s Surface Water Management Utility Fee, REET funds. Funding could be obtained through local budget or grants.
4. **Lead Department(s)** = Surface Water Management Programs (PC PWU)
5. **Timeline** = Ongoing
6. **Benefit** = County-Wide (Especially Clear Creek and Clover Creek Repetitive Flood Loss Areas)
7. **Life of Measure** = Perpetual
8. **Community Reaction** = The proposal is likely to be endorsed by the entire community.

Preventative Maintenance: Flood Control Infrastructure

Hazards: F

The County will continue to maintain and rehabilitate existing county-owned flood hazard reduction facilities and infrastructure (i.e. ponds, levees and revetments) to reduce the flood risk to public and private property and infrastructure during flood events. Maintaining a consistent level of flood protection requires an annual program composed of vegetation maintenance, repairs, and rehabilitation.

1. **Goal(s) Addressed** = Protect Life and Property; Ensure Continuity of Operations; Protect the Environment
2. **Cost of Measure** = TBD
3. **Funding Source and Situation** = County’s Surface Water Management Utility Fee, REET funds. Funding could be obtained through local budget or grants.

4. **Lead Department(s)** = Surface Water Management Programs (PC PWU)
5. **Timeline** = Ongoing
6. **Benefit** = County-Wide (Especially Clear Creek and Clover Creek Repetitive Flood Loss Areas)
7. **Life of Measure** = Perpetual
8. **Community Reaction** = The proposal is likely to be endorsed by the entire community.

Repetitive Flood Loss Properties

Hazards: F

The County will continue to offer relocation incentives to current flood hazard area residents and businesses to reduce repeated property damage, contamination hazards, and personal safety risks associated with their current activities.

The County will continue to develop, advertise, and generate a contact list for a repetitive flood loss property acquisition program including a comprehensive property management plan outlining use options of acquired properties to prevent development or redevelopment and to preserve acquired properties as open space in perpetuity.

1. **Goal(s) Addressed** = Protect Life and Property; Promote A Sustainable Economy; Protect the Environment
2. **Cost of Measure** = TBD
3. **Funding Source and Situation** = REET Fund, and Private Funding where applicable. Funding could be obtained through local budget or grants. FEMA HMGP, PDM and WS FCAAP Grants.
4. **Lead Department(s)** = Surface Water Management (PC PWU)
5. **Timeline** = Long-term
6. **Benefit** = County-Wide (Especially Clear Creek, Clover Creek, and Nisqually River Repetitive Flood Loss Areas)
7. **Life of Measure** = TBD
8. **Community Reaction** = The proposal is likely to be endorsed by the entire community.

New Construction: Flood Control Infrastructure

Hazards: F

The County will continue to design and construct new facilities to enhance flood conveyance and storage during storm events such as ponds and setback levees. The Pierce County Rivers Flood Hazards Management Plan and the various basin plans recommends numerous capital projects to address flood hazards and their impacts. Examples of the capital projects include the following measures (but not limited to) that are specific to flood loss areas:

- **Property Acquisition:** Clear Creek, Clover Creek, Nisqually River Repetitive Flood Loss Areas
- **Setback Levees:** Several setback levee project along the Puyallup, Carbon and White Rivers
- **Culvert Replacements and Property Acquisitions:** Clover Creek Repetitive Flood Loss Area
- **Retention/Detention Ponds:** Clear Creek, Clover Creek, Nisqually River Repetitive Flood Loss Areas
- **Permanent Pump Station:** Clear Creek Repetitive Flood Loss Area

- **Setback Levees:** Clear Creek Repetitive Flood Loss Area
 - **Culvert Replacements:** Clover Creek Repetitive Flood Loss Area
1. **Goal(s) Addressed** = Protect Life and Property; Promote A Sustainable Economy; Ensure Continuity of Operations; Increase Public Preparedness; Protect the Environment
 2. **Cost of Measure** = Engineering studies, equipment, materials, labor and more
 3. **Funding Source and Situation** = County Surface Water Management Utility Fee, REET funds. Funding could be obtained through local budget or grants.
 4. **Lead Department(s)** = Surface Water Management (PC PWU)
 5. **Timeline** = Long-term
 6. **Benefit** = County-Wide
 7. **Life of Measure** = Life of Structure
 8. **Community Reaction** = The proposal is likely to be endorsed by the entire community

Surface Water Management Programs Emergency Response Management Plan

Hazards: F

The County will continue to maintain the resources needed to respond to emergency flood situations. This includes the following:

- Continue implementation of the Surface Water Management emergency response plan so that the staff, equipment, communication tools, technology, materials, and contractors needed to respond to emergency events effectively prepared.
 - Continue to update emergency evaluation/hot spot areas.
 - Continue to coordinate with other local, state, and federal agencies to review and update flood response efforts.
1. **Goal(s) Addressed** = Protect Life and Property; Ensure Continuity of Operations; Establish and Strengthen Partnerships for Implementation.
 2. **Cost of Measure** = TBD
 3. **Funding Source and Situation** = REET Fund, and Private Funding where applicable. Funding could be obtained through local budget or grants.
 4. **Lead Department(s)** = Surface Water Management Programs (PC PWU)
 5. **Timeline** = Ongoing
 6. **Benefit** = County-Wide (Especially Clear Creek, Clover Creek, and Nisqually River Repetitive Flood Loss Areas)
 7. **Life of Measure** = Extent of the life of the program
 8. **Community Reaction** = The proposal is likely to be endorsed by the entire community.

Purdy Road Shop: Develop Program to Place Utilities Underground

Hazards: All

This measure will continue to pursue implementation of a program to place utilities underground at the Purdy Road Shop facilities.

1. **Goal(s) Addressed** = Protect Life and Property; Ensure Continuity of Operations
2. **Cost of Measure** = \$100,000
3. **Funding Source and Situation** = Road Fund. Funding could be obtained through local budget or grants.
4. **Lead Department(s)** = Road Operations Division (PC PWU)
5. **Timeline** = Long-term
6. **Benefit** = Facility specific
7. **Life of Measure** = Life of the facility
8. **Community Reaction** = The proposal would benefit those affected, with no adverse reaction from others.

Bridge Retrofit Program

Hazards: All

The County will continue its Bridge Retrofit Program that includes 160 bridges in Pierce County. The Retrofit Program provides for either systemic retrofitting to current seismic and other hazard standards or for eventual replacement of the subject bridges. Bridges should be designed in consideration of scour and freeboard above the base flood elevation and include assessments of future peak discharge flows and backwater effects.

1. **Goal(s) Addressed** = Protect Life and Property; Ensure Continuity of Operations; Promote A Sustainable Economy
2. **Cost of Measure** = Cost of engineering study and then the cost of actual retrofit
3. **Funding Source and Situation** = Funding could be obtained through local budget or grants.
4. **Lead Department(s)** = Transportation Division (PC PWU)
5. **Timeline** = Ongoing
6. **Benefit** = Facility Specific; County-Wide
7. **Life of Measure** = Life of project
8. **Community Reaction** = The proposal is likely to be endorsed by the entire community.

Bridge for Kids

Hazards: All

The County will continue to support the construction of a pedestrian bridge in downtown Orting across the Carbon River connecting with recreation trails coming down the hill from the development in Cascadia. This will allow students and others in the City of Orting a quick and easy evacuation route from the town. A second bridge will be constructed over SR 162 near the entrance to Ptarmigan Ridge School. This bridge, by the school, will allow children from Ptarmigan Ridge to safely cross the highway giving them access to the bridge over the Carbon. In the last 5 years, PC DEM has

played a support role and lead role in this project. Recently, PC PWU has taken on a project lead role in assisting in the development of this measure.

1. **Goal(s) Addressed** = Protect Life and Property; Increase Public Preparedness
2. **Cost of Measure** = Engineering, contractor, equipment and materials and labor.
3. **Funding Source and Situation** = The only potential funding source is a federal or state mitigation grant.
4. **Lead Department(s)** = PC Public Works; B4K's (Bridge For Kids) with Orting School District, City of Orting and PC DEM
5. **Timeline** = Long-term
6. **Benefit** = County-Wide (Especially Puyallup River Valley in Orting area)
7. **Life of Measure** = Life of bridge when built
8. **Community Reaction** = The proposal is would benefit those affected, with no adverse reaction from others.

Evacuation Planning: New Roads and Development

Hazards: All

The County will continue to review evacuation routes to incorporate into the evacuation plan new roads and developments as they are created. For example, Lake Tapps Parkway, the East Valley Overpass, the Rhodes Lake Road Corridor, and other roads identified in the Transportation Improvement Program will be considered in this review.

1. **Goal(s) Addressed** = Protect Life and Property; Ensure Continuity of Operations
2. **Cost of Measure** = Staff time and materials
3. **Funding Source and Situation** = Funding could be obtained through local budget or grants.
4. **Lead Department(s)** = PC DEM; Transportation Division (PC PWU)
5. **Timeline** = Long-term
6. **Benefit** = County-Wide (Especially Carbon, Nisqually, Puyallup, and White River Valleys)
7. **Life of Measure** = Perpetual
8. **Community Reaction** = The proposal is likely to be endorsed by the entire community.

Elevation of 192nd St East above Flood Elevation

Hazards: F

192nd Street East (between 38th Ave W and Canyon Road) is vulnerable to flooding conditions which disrupts traffic flow for businesses and for residents. PC Public Works & Utilities: Transportation Programs will reconstruct the roadway above the flood elevation and provide culverts for drainage as needed.

1. **Goal(s) Addressed** = Protect Life and Property; Promote a Sustainable Economy; Ensure Continuity of Operations
2. **Cost of Measure** = \$2,260,000
3. **Funding Source and Situation** = FY2010 Mitigation Program.

4. **Lead Department(s)** = PC PW's & Transportation; Port of Tacoma
5. **Timeline** = Long-term
6. **Benefit** = County-Wide
7. **Life of Measure** = 30 years
8. **Community Reaction** = The proposal is likely to be endorsed by the entire community.

Protection of Road Corridors from Channel Migration Hazards

Hazards: F

The County will seek to improve existing roadway corridors to ensure the main safety routes and access points are accessible as much as possible. Construction of new roads and rehabilitation of existing roadways to at least one foot above the base flood elevation should be explored. Additional study should be done to determine the best method to protect roadway corridors from Channel Migration Hazards. Specific projects include:

- Orville Road Channel Migration Protection
- Neadham Road Flooding and Channel Migration Protection
- Upper Carbon/Fairfax Road Channel Migration Protection

1. **Goal(s) Addressed** = Protect Life and Property
2. **Cost of Measure** = N/A
3. **Funding Source and Situation** = N/A
4. **Lead Department(s)** = N/A
5. **Timeline** = N/A
6. **Benefit** = County-Wide
7. **Life of Measure** = 30 years
8. **Community Reaction** = The proposal is likely to be endorsed by the entire community.

Facility Security Enhancements

Hazards: All

Assess and identify security risks at the Environmental Services Building (ESB) and Sewer/Traffic Operations Complex (STOP) in order to detect and prevent harm to staff or visitors, or damage to facilities or the environment. Install recommended security measures and improve the four legacy cameras at the ESB for enhanced external and internal video coverage. Establish plans and procedures for public/employee evacuation, building lockdown, and active shooter scenarios. Enable remote monitoring from the Pierce County Security Operations Center for faster law enforcement response and security checks during and after public events at the ESB.

1. **Goal(s) Addressed** = Protect Life and Property; Public Safety; Protect Environment; Ensure Continuity of Operations.
2. **Cost of Measure** = \$60,000
3. **Funding Source and Situation** = Ratepayer funds, annual budget, or grant funds.
4. **Lead Jurisdiction(s)** = Sewer Division (PC PWU); Pierce County Security

5. **Timeline** = Short-term
6. **Benefit** = At ESB, benefits PC Parks and Recreation Department customers and users of Chambers Creek Properties. At both ESB and STOP, benefits county employees and their families, law enforcement and first responder agencies, protection of county assets
7. **Life of Measure** = Ongoing
8. **Community Reaction** = The proposal is likely to be endorsed by the entire community.

Security Plan and Security Investments for Wastewater Treatment Plant

Hazards: All

Per the 2013 DHS Wastewater Treatment Plant Vulnerability Assessment, create a wastewater treatment plant site security plan that addresses needs for security force, security management, information sharing (including first responder plan), security activity background, and physical security improvements. Invest in security force elements and surveillance camera technology monitored via the Lenel system from the Pierce County Security Operations Center.

1. **Goal(s) Addressed** = Protect Life and Property; Protect Environment; Ensure Continuity of Operations.
2. **Cost of Measure** = \$500,000 - \$1,000,000
3. **Funding Source and Situation** = Ratepayer funds, annual budget, or grant funds.
4. **Lead Jurisdiction(s)** = Sewer Division (PC PWU); Pierce County Security
5. **Timeline** = Short-term (1-2 years)
6. **Benefit** = Enhanced protection for multi-million dollar facility and infrastructure
7. **Life of Measure** = 5 years
8. **Community Reaction** = the proposal is likely to be endorsed by the entire community. The community has an expectation that the County will enact measures to protect public facilities to prevent interruption of sewer services.

Spill Containment Procedures and Structures at the Wastewater Treatment Plant

Identify and install measures to contain and retain accidental spills of untreated or partially treated wastewater at the WWTP in the headworks and ultraviolet disinfection areas, including but not limited to, early alert systems, diversion mechanisms, containment basins, and clean-up equipment and supplies.

1. **Goal(s) Addressed** = Protect Life and Property; Protect Public Health and the Environment.
2. **Cost of Measure** = \$100,000
3. **Funding Source and Situation** = Ratepayer funds; annual budget
4. **Lead Jurisdiction(s)** = Sewer Division (PC PWU)
5. **Timeline** = Ongoing
6. **Benefit** = Enhanced Puget Sound, shoreline areas, public-access beaches
7. **Life of Measure** = Long-term
8. **Community Reaction** = the proposal is likely to be endorsed by the entire community. Protecting Puget Sound was ranked high in a survey of customer priorities for the Sewer Division.

Spill Containment and Recovery Measures for Sewer Pipeline Failures

Hazards: MM

Identify and purchase equipment and hardware to contain and reduce the impact of accidental spills resulting from sewer pipeline failures. This includes purchasing lengths of various pipe sizes, pumps, pressure pipe, connectors, and containment/environmental clean-up supplies in order to reduce and repair pipe failures as quickly as possible.

1. **Goal(s) Addressed** = Protect Life and Property; Protect Public Health and the Environment.
2. **Cost of Measure** = \$50,000
3. **Funding Source and Situation** = Ratepayer funds; annual budget
4. **Lead Jurisdiction(s)** = Sewer Division (PC PWU)
5. **Timeline** = Ongoing
6. **Benefit** = Puget Sound, shoreline areas, streams, public-access areas, roadways, and private property public-access beaches
7. **Life of Measure** = Long-term
8. **Community Reaction** = the proposal is likely to be endorsed by the entire community. Rapid spill recovery reduces impacts to the public and environment.

Continuity of Operations Measures

Hazards: All

Implement selected elements of the Sewer Division Continuity of Operations plan to promote rapid restoration of mission-essential functions following a localized disaster or more widespread incident. Elements include:

- Retrofit an existing space at the wastewater treatment plant to function as an Incident Command Center (ICC) and outfit it with provisions sufficient to operate as an ICC, including ICC-dedicated radios for Command staff.
- Stockpile a supply of universal repair parts for the sewer collection (pipe) system, to include lengths of generic large bore pipe and a supply of adaptors in assorted sizes.
- Translate sewer emergency messages into foreign languages for distribution to rate payers during an interruption of service.
- Plan and outfit a basic employee base camp to facilitate 12-hour work shifts during an incident response, to address shelter, heat, food, rest, sleeping, and sanitation needs.

1. **Goal(s) Addressed** = Protect Life and Property; Ensure Continuity of Operations; Increase Public Communication.
2. **Cost of Measure** = \$50,000
3. **Funding Source and Situation** = Ratepayer funds; annual budget, or grant funded
4. **Lead Jurisdiction(s)** = Sewer Division (PC PWU)
5. **Timeline** = Ongoing
6. **Benefit** = County-wide within the sewer service area
7. **Life of Measure** = Long-term for facilities and durable goods, five years for expendables

8. **Community Reaction** = the proposal is likely to be endorsed by the entire community. The community has an expectation that essential sewer services will be continued without interruption even during a power failure.

Rehabilitate Sewer System Manholes for Longevity and Structural Integrity

Hazards: All

Rehabilitate 34 manholes by removing corroded concrete, installing a protective coating to prevent future corrosion, and performing minor structural improvements. Corrosion occurs naturally in the presence of sewer gas. Rehabilitation is less expensive than manhole replacement and contributes to the structural integrity of the sewer system, preventing collapse and failure.

1. **Goal(s) Addressed** = Protect Public Health and the Environment; Continuity of Operations
2. **Cost of Measure** = \$400,000
3. **Funding Source and Situation** = Ratepayer funds; annual budget
4. **Lead Jurisdiction(s)** = Sewer Division (PC PWU)
5. **Timeline** = Short-term (1-2 years)
6. **Benefit** = Countywide within the sanitary sewer service area
7. **Life of Measure** = Long-term (20+ years)
8. **Community Reaction** = the proposal is likely to be endorsed by the entire community. The community has an expectation that essential sewer services will deliver services without interruption.

Parkland/Brookdale Sewer Main Replacement

Hazards: E, MM

Replace undersized, damaged concrete sewer pipe that is vulnerable to failure with larger high density polyethylene (HDPE) pipe. HDPE is more flexible and resistant to earth movement than concrete. In addition, the new pipe will eliminate the existing groundwater intrusion into the sewer system at this location and reduce the possibility of raw sewage leaking out of the pipe.

1. **Goal(s) Addressed** = Protect Public Health and the Environment; Continuity of Operations
2. **Cost of Measure** = \$1,000,000
3. **Funding Source and Situation** = Ratepayer funds; annual budget
4. **Lead Jurisdiction(s)** = Sewer Division (PC PWU)
5. **Timeline** = Short-term
6. **Benefit** = Residents of Pierce County's Parkland/Brookdale community sewer service area
7. **Life of Measure** = Long-term
8. **Community Reaction** = the proposal is likely to be endorsed by the entire community, especially residents of the Parkland/Brookdale area. The community has an expectation that the sewer system will deliver services without interruption or compromising the environment.

PWU Public Education – Mitigation Measure

Public Education: Flood

Hazards: F

The County will continue and expand the Surface Water Management Public Information Plan regarding public education related to flooding . The purpose is to increase the ability of residents to react appropriately during a flood event and reduce the potential for injuries and/or loss of life and property damage impacts of a flood event through education and outreach. This program employs a variety of means including:

- Direct mail to flood hazard area residents with information on how to respond to floods and the availability of insurance.
- Offer and advertise technical assistance to farmers and business owners on how to reduce property and livestock losses during floods and on how to prevent hazardous substance spills.
- Develop and implement a general advertising campaign addressing the potential dangers of flood events and their avoidance, as well as explaining how floodplains and floodways function.
- Canvas areas of high potential for flooding with comprehensive information on flood hazards, flood insurance and other specific information. Communities often canvassed are Orting, Sumner, Riverside, Puyallup and South Prairie.

1. **Goal(s) Addressed** = Protect Life and Property; Promote a Sustainable Economy; Increase Public Preparedness; Protect the Environment
2. **Cost of Measure** = Varies depending on staff time, materials and postage
3. **Funding Source and Situation** = County’s Surface Water Management Utility Fee, REET Funds. Funding could be obtained through local budget or grants.
4. **Lead Department(s)** = Surface Water Management Programs (PC PWU), PC DEM
5. **Timeline** = Ongoing
6. **Benefit** = County-Wide (Especially Clear Creek, and Nisqually River Repetitive Loss Areas)
7. **Life of Measure** = Varies depending on project
8. **Community Reaction** = The proposal is likely to be endorsed by the entire community.

Community Services – Mitigation Measure

Tree Maintenance Program

Hazards: SW, WUI

The County will continue programs to trim tree branches and cut down trees which might threaten the safety of either the citizens or the public infrastructure. The County will expand the program to work with gardening centers, Master Gardeners, and the Pierce County Cooperative Extension to develop a continuing program to assist the public with preventing storm damage through the proper use of vegetation and trimming of dangerous limbs. This program will be developed in unison with similar information on fire mitigation through creation of —defensible space.

1. **Goal(s) Addressed** = Protect Life and Property; Promote a Sustainable Economy; Ensure Continuity of Operations; Increase Public Preparedness; Establish and Strengthen Partnerships for Implementation
2. **Cost of Measure** = Staff time and materials, equipment
3. **Funding Source and Situation** = Funding could be obtained through local budget
4. **Lead Department(s)** = PC DEM; Cooperative Extension (PC Community Services)
5. **Timeline** = Short-term
6. **Benefit** = County-Wide (Especially Eastern PC and Peninsula Region)
7. **Life of Measure** = Continuous
8. **Community Reaction** = The proposal is likely to be endorsed by the entire community.

Economic Development – Mitigation Measure

Pre-Disaster Business Mitigation Loan Program

Hazards: All

The County will pursue implementation of the Small Business Administration (SBA) Pre-Disaster Mitigation Loan Program. The purpose is to make low-interest, fixed-rate loans eligible to small businesses for the purpose of implementing mitigation measures.

1. **Goal(s) Addressed** = Protect Life and Property; Promote a Sustainable Economy; Establish and Strengthen Partnerships for Implementation
2. **Cost of Measure** = TBD
3. **Funding Source and Situation** = SBA loan program and possible other grants.
4. **Lead Department(s)** = SBA with PC DEM; PC Chambers of Commerce; PC Economic Development; PC Historically Underutilized Businesses Program (HUB)
5. **Timeline** = Long-term
6. **Benefit** = County-Wide (business)
7. **Life of Measure** = Pilot (TBD)
8. **Community Reaction** = The proposal is likely to be endorsed by the entire community.

Information Technology – Mitigation Measures

Information Technology-Essential Records Protection

Hazards: All

The County will continue to ensure that all essential records are protected and/or provided with safe backup. All County Departments will continue to implement their essential records protection schedules. This will be implemented through their disaster record plans. This effort will be tied to the County COOP Coordinator Group.

1. **Goal(s) Addressed** = Establish Continuity of Operations
2. **Cost of Measure** = Staff time, contract for security oversight
3. **Funding Source and Situation** = Funding could be obtained through local budget or grants.
4. **Lead Department(s)** = PC Information Technology; PC DEM; COOP Coordinator Group
5. **Timeline** = Ongoing
6. **Benefit** = all Pierce County Departments
7. **Life of Measure** = Perpetual
8. **Community Reaction** = The proposal is likely to be endorsed by the entire community.

Pierce County Information Technology Department Fiber Ring

Hazards: All

Protection of Pierce County Information Technology fiber ring which connects all departments to the County information system.

1. **Goal(s) Addressed** = Ensure Continuity of Operations
2. **Cost of Measure** = Staff time, contract for security oversight
3. **Funding Source and Situation** = Funding could be obtained through local budget or grants.
4. **Lead Department(s)** = PC Information Technology
5. **Timeline** = Ongoing
6. **Benefit** = all Pierce County Departments
7. **Life of Measure** = Perpetual
8. **Community Reaction** = The proposal is likely to be endorsed by the entire community.

Planning and Land Services – Mitigation Measures

Tsunami Critical Area Regulation

Hazards: F, T

The County will explore how land use regulations related to new tsunami inundation hazard maps could be implemented. These maps and related hazard information provide new best available science for the tsunami threat facing the County. The strongest mitigation capability the County has resides in land use codes and building codes. There may be a potential link to existing flood hazard regulations and opportunity to provide guidance on how to build in these potential inundation areas. Research from Washington State Coastal Communities best practices and from Countries in the Indian Ocean may provide guidance in exploring these regulations.

1. **Goal(s) Addressed** = N/A. Goals addressed are contingent upon the area-specific mitigation measures resulting from this priority
2. **Cost of Measure** = Research costs, staff time, materials
3. **Funding Source and Situation** = Funding could be obtained through local budget or grants.
4. **Lead Department(s)** = PC Pals; PC DEM; Surface Water Management Programs (PC PWU)
5. **Timeline** = Long-term
6. **Benefit** = County-Wide (Especially coastal regions)
7. **Life of Measure** = Perpetual
8. **Community Reaction** = The proposal is likely to be endorsed by the entire community.

Pierce County Sheriff – Mitigation Measures

Infrastructure: Response Considerations

Hazards: All

The County will continue to re-evaluate infrastructure to take into considerations the tactical needs of response agencies following natural disasters. This may result in identifying areas where new infrastructure is needed for staging personnel and equipment to support natural and human caused hazard response.

1. **Goal(s) Addressed** = N/A.
2. **Cost of Measure** = TBD
3. **Funding Source and Situation** = Funding could be obtained through local budget or grants.
4. **Lead Department(s)** = Pierce County Sheriff Department; Fire Districts
5. **Timeline** = Short-term
6. **Benefit** = Facility Specific, County-Wide Services
7. **Life of Measure** = PTBD
8. **Community Reaction** = The proposal is likely to be endorsed by the entire community.

Pierce County Sheriff-Peninsula Detachment: Back-up System for loss of Water and Sewer

Hazards: All

The Sheriff's Peninsula Detachment will conduct an analysis of the available water supply, delivery system and sewer system to determine their adequacy and the need for additional water sources and sewage removal options.

1. **Goal(s) Addressed** = Protect Life and Property; Ensure Continuity of Operations
2. **Cost of Measure** = TBD
3. **Funding Source and Situation** = Funding could be obtained through local budget or grants.
4. **Lead Department(s)** = PC Facilities Management
5. **Timeline** = Long-term
6. **Benefit** = Sheriff's Peninsula Detachment Building employs about 20, their varying number of clients and the indirect services provided to County residents
7. **Life of Measure** = 30 Years
8. **Community Reaction** = The proposal will benefit those affected, with no adverse reaction from others.

Pierce County Sheriff: Peninsula Detachment Nonstructural Retrofit

Hazards: E

The Sheriff's Peninsula Detachment would undergo a nonstructural seismic retrofit including: securing and bracing HVAC, lighting, ductwork, and ceiling system to prevent their falling. This measure would take place over many years due to the amount of work needed to be done and the project costs related to available funding sources.

1. **Goal(s) Addressed** = Protect Life and Property; Ensure Continuity of Operations
2. **Cost of Measure** = TBD
3. **Funding Source and Situation** = Future Remodeling Budgets. Funding could be obtained through local budget or grants.
4. **Lead Department(s)** = PC Facilities Management
5. **Timeline** = Long-term
6. **Benefit** = Sheriff's Peninsula Detachment Building employs about 20, their varying number of clients and the indirect services provided to County residents
7. **Life of Measure** = 30 Years
8. **Community Reaction** = The proposal would benefit those affected, with no adverse reaction from others.

Sheriff South Hill Precinct: Nonstructural Retrofit

Hazards: E

The Sheriff's South Hill Precinct will undergo a nonstructural seismic retrofit including: securing and bracing HVAC, lighting, ductwork, and ceiling systems. This is a multiple year project due to the amount of work and the project costs related to available funding sources.

1. **Goal(s) Addressed** = Protect Life and Property; Increase Public Preparedness
2. **Cost of Measure** = Staff time and materials
3. **Funding Source and Situation** = Funding could be obtained through local budget or grants.
4. **Lead Department(s)** = PC DEM
5. **Timeline** = Ongoing
6. **Benefit** = County-Wide
7. **Life of Measure** = Continuous
8. **Community Reaction** = The proposal is likely to be endorsed by the entire community.

Mitigation Measure Monitoring

In comparison to the previous update, Pierce County has 25 new mitigation strategies, numerous continuing, 5 that have been removed and 1 that has been accomplished.

Mitigation Strategy	New	Continuing	Accomplished	Removed from update (if applicable)
Existing Mitigation Actions (<i>All</i>)		X		
Plan Maintenance (<i>All</i>)		X		
Pierce County Hazard Mitigation Forum (<i>E,L,V,D,F,WUI,SW,MM</i>)		X		
Capability Identification and Evaluation (<i>E,L,V,D,F,WUI,SW,MM</i>)		X		
Underground Utilities (<i>All</i>)		X		
Retrofit of Lower Puyallup Levee System (<i>F</i>)	X			
Fire District Annexations (<i>WUI</i>)		X		
Develop Firewise Communities (<i>WUI</i>)		X		
Hazard Mitigation Committee (<i>All</i>)		X		
All Hazards Mitigation Plan (<i>All</i>)		X		
Continuity of Government Plan (<i>All</i>)	X			

Mitigation Strategy	New	Continuing	Accomplished	Removed from update (if applicable)
Disaster Recovery Plan <i>(All)</i>		X		
NOAA All-Hazards Program <i>(All)</i>		X		
Natural Hazard Insurance Information <i>(All)</i>		X		
Public Education: Severe Weather <i>(SW)</i>		X		
Public Education: Lahar <i>(V)</i>		X		
Public Education: Volcanic Ashfall <i>(V)</i>		X		
Public Education: Evacuation Routes <i>(V)</i>		X		
Public Education: Pierce County Neighborhood Emergency Teams <i>(All)</i>		X		
Public Education Campaigns: All Hazards <i>(All)</i>		X		
Public Education Campaigns: Post-Disaster, All Hazards <i>(All)</i>		X		
Critical Infrastructure: Access Limitation Evaluation <i>(All)</i>		X		

Mitigation Strategy	New	Continuing	Accomplished	Removed from update (if applicable)
Pierce County Human Services South Bldg.: Nonstructural Retrofit (<i>All</i>)	X			
Volcanic Hazards Response and Recovery Standard Operating Procedures (<i>V</i>)	X			
FEMA Flood Insurance Rate Maps (<i>F</i>)		X		
Channel Migration Zone Mapping (<i>F</i>)	X			
Levee System: Facility Assessment Plan Development (<i>E, V, LS</i>)	X			
Setback Levees (<i>F</i>)		X		
Protection of critical Facilities and Infrastructure (<i>F</i>)	X			
Preventative Maintenance: Flood Control Infrastructure (<i>F</i>)		X		
Repetitive Flood Loss Properties (<i>F</i>)		X		
New Construction: Flood Control Infrastructure (<i>F</i>)		X		
Surface Water Management Programs Emergency Response Management Plan (<i>F</i>)	X			

Mitigation Strategy	New	Continuing	Accomplished	Removed from update (if applicable)
Purdy Road Shop: Develop Program to Place Utilities Underground (<i>E, F, SW, MM</i>)	X			
Bridge Retrofit Program (<i>All</i>)	X			
Bridge for Kids (<i>All</i>)		X		
Evacuation Planning: New Roads and Development (<i>All</i>)		X		
Elevation of 192 nd St East above Flood Elevation (<i>F</i>)	X			
Protection of Road Corridors from Channel Migration Hazards (<i>F</i>)	X			
Facility Security Enhancements (<i>All</i>)	X			
Security Plan and Security Investments for Wastewater Treatment Plant (<i>All</i>)	X			
Spill Containment Procedures and Structures at the wastewater Treatment Plant (<i>MM</i>)	X			
Spill Containment and Recovery Measures for Sewer Pipeline Failures (<i>MM</i>)	X			

Mitigation Strategy	New	Continuing	Accomplished	Removed from update (if applicable)
Continuity of Operations measures <i>(All)</i>	X			
Rehabilitate Sewer System Manholes for longevity and Structural Integrity <i>(All)</i>	X			
Parkland/Brookdale Sewer Main Replacement <i>(E, MM)</i>	X			
Public Education: Flood <i>(F)</i>		X		
Tree Maintenance Program <i>(SW, WUI)</i>		X		
Evacuation Planning: New Roads and Development <i>(All)</i>		X		
Pre-Disaster Business Mitigation Loan Program <i>(All)</i>		X		
Information Technology: Essential Records Protection <i>(All)</i>	X			
Pierce County Information Technology Department Fiber Ring <i>(All)</i>	X			
Tsunami Critical Area Regulation <i>(F, T)</i>	X			

Mitigation Strategy	New	Continuing	Accomplished	Removed from update (if applicable)
Infrastructure: Response Considerations (<i>All</i>)	X			
Pierce County Sheriff Peninsula Detachment: Back-up system for loss of system and sewer (<i>All</i>)		X		
Pierce County Sheriff Peninsula Detachment Nonstructural Retrofit (<i>E</i>)	X			
Sheriff South Hill Precinct: Nonstructural Retrofit (<i>E</i>)	X			
Property Acquisition Program: Selection Process		X		
Preventative Maintenance Plan PC DEM Communications Division		X		
Critical Facilities: Auxiliary Power (Facilities Management)		X		
Critical Facilities: Access Limitation Evaluation		X		
Critical Facilities: Response Considerations (PCSD)		X		
Critical Facilities: PC SD Water and Sewer Requirements		X		

Mitigation Strategy	New	Continuing	Accomplished	Removed from update (if applicable)
Critical Facilities: Fire Stations				X
LIDAR Mapping Project		X		
Ortho-Based Hazard Mapping		X		
Risk Assessment: Hazard Modeling		X		
County Facilities Strengthening Project		X		
Shelter Evaluation		X		
DEM University: Mitigation and Recovery Classes		X		
Hazard Abatement Districts		X		
Disaster Response and Recovery Procedures: Pierce County Aging and Long Term Care Plan		X		
Disaster Resistant Universities				X
Critical Facilities: Seismic Evaluation		X		
Non-Structural Retrofitting Policies for Remodel Projects		X		
Natural Resource Protection		X		

Mitigation Strategy	New	Continuing	Accomplished	Removed from update (if applicable)
New Construction: Flood Control Infrastructure		X		
Transportation Routes: Bridge and Bridge Mitigation		X		
Transportation Routes: Alternative Routes		X		
Coordination with Local Cities and Towns		X		
Project Prioritization				X
Floodplain regulation: Limit Development		X		
Surface Water Reduction: Financial Incentives		X		
Surface Water Reduction: Control Standards		X		
Surface Water Reduction: Absorbent Building Material		X		
Response: Water Programs Emergency Resource Maintenance		X		
Response: Emergency Monitoring and Communication System		X		

Mitigation Strategy	New	Continuing	Accomplished	Removed from update (if applicable)
Surface Water Reduction: Low Impact Developments		X		
Mt. Rainier Closure Zones		X		
Dam Draw Down Agreements			X	
Lahar Flow Control		X		
176 th Street East Extension				X
Tax or Insurance Disincentives		X		
Public Education: Education for Self Warning and Evacuation		X		
Public Education: Bus Driver Evacuation Training Program				X
Risk Assessment: Landslide Occurrence Map		X		
Landslide-Warning System		X		
Buy-Out Program: Landslide Hazard		X		
Tsunami Inundation Zone Maps		X		
Public Education: WUI Fire		X		

Endnotes

¹ Hazard Codes:

Where necessary, the specific hazards addressed are noted as follows:

A:	Avalanche
E:	Earthquake
F:	Flood
D:	Drought
T:	Tsunami
V(L OR T):	Volcanic (lahar or tephra-specific)
SW:	Severe Storm (wind-specific)
L:	Landslide
WUI:	Wildland/Urban Interface Fire
MM:	Manmade to include terrorism
ALL:	All hazards, including some man-made. Where only natural hazards are addressed, it is noted.

² While this Plan is strictly a *Natural* hazard mitigation plan, where a measure stems from a facility recommendation (Infrastructure Section) that deals specifically with terrorism, the mitigation strategy will use that analysis. Other measures, such as those that deal with multi-hazard community preparedness or recovery planning, mitigate man-made hazards and are noted as such. It is not the intent of this notation to imply that all measures were analyzed with regards to man-made hazards or that measures were identified with that in mind. Rather, the notation merely illustrates the potential on this template for the inclusion of man-made hazard analysis.