

## 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  
2020-2025 EDITION  
UNINCORPORATED PIERCE COUNTY  
MITIGATION STRATEGY**

Table of Contents

**MITIGATION STRATEGY REQUIREMENTS..... 1**  
**TABLE OF CONTENTS ..... 2**  
**STARTUP MITIGATION MEASURES ..... 8**  
    EXISTING MITIGATION ACTIONS .....8  
    PLAN MAINTENANCE .....8  
**HAZARD MITIGATION FORUM..... 10**  
    PIERCE COUNTY HAZARD MITIGATION FORUM .....10  
**EMERGENCY MANAGEMENT AND LOCAL JURISDICTIONS – MITIGATION MEASURES ..... 11**  
    UNDERGROUND UTILITIES.....11  
    FIRE DISTRICT ANNEXATIONS .....11  
    CREATE FIRE RESILIENT COMMUNITIES .....12  
**EMERGENCY MANAGEMENT –MITIGATION MEASURES ..... 14**  
    HAZARD MITIGATION COMMITTEE.....14  
    ALL-HAZARDS MITIGATION PLAN .....14  
    CONTINUITY OF OPERATIONS .....15  
**EMERGENCY MANAGEMENT PUBLIC EDUCATION ..... 17**  
    PUBLIC EDUCATION: SEVERE WEATHER.....17  
    PUBLIC EDUCATION: LAHAR .....17  
    PUBLIC EDUCATION: VOLCANIC ASHFALL .....18  
    PUBLIC EDUCATION CAMPAIGNS: ALL HAZARDS.....19  
**FACILITIES MANAGEMENT – MITIGATION MEASURES ..... 20**  
    CRITICAL INFRASTRUCTURE: ACCESS LIMITATION EVALUATION .....20  
    VOLCANIC HAZARD RESPONSE AND RECOVERY STANDARD OPERATING PROCEDURES.....20  
    INFRASTRUCTURE: RESPONSE CONSIDERATIONS.....21  
    SHERIFF SOUTH HILL PRECINCT: NONSTRUCTURAL RETROFIT .....22  
**INFORMATION TECHNOLOGY – MITIGATION MEASURES..... 23**  
    INFORMATION TECHNOLOGY-ESSENTIAL RECORDS PROTECTION .....23

PIERCE COUNTY INFORMATION TECHNOLOGY DEPARTMENT FIBER RING .....	23
ENSURE USER CONNECTIVITY TO SAAS CRITICAL BUSINESS SYSTEMS .....	24
SUPPORT SECURE REMOTE COMPUTING.....	25
PROTECT EXISTING ON PREMISES DATA CENTER FACILITIES.....	25
<b>PLANNING AND PUBLIC WORKS-SEWER CHAMBERS BAY WASTEWATER TREATMENT PLANT (WWTP) MITIGATION MEASURES .....</b>	<b>27</b>
FACILITY SECURITY ENHANCEMENTS.....	27
FACILITY SECURITY .....	27
DAY ISLAND PUMP STATION-GRINDER PUMP PROJECT .....	28
EQUIPMENT-PORTABLE GODWIN PUMP STATION BYPASS .....	29
STREAMLINED EMERGENCY COMMUNICATIONS-SATELLITE PHONE SYSTEMS.....	30
UPDATE EMERGENCY SUPPLIES FOR ON-SITE FOOD, WATER, AND SUPPLIES.....	30
EMERGENCY EQUIPMENT-BOOM TRUCK .....	31
KAPOWSIN FIRE RESPONSE UPGRADE .....	32
CONTINUITY OF OPERATIONS MEASURES .....	33
REHABILITATE SEWER SYSTEM MANHOLES FOR LONGEVITY AND STRUCTURAL INTEGRITY.....	34
<b>PLANNING AND PUBLIC WORKS-SWM – MITIGATION MEASURES .....</b>	<b>35</b>
FEMA FLOOD INSURANCE RATE MAPS .....	35
CHANNEL MIGRATION ZONE MAPPING.....	36
LEEVE SYSTEM: FACILITY ASSESSMENT PLAN DEVELOPMENT .....	37
SETBACK LEVEES .....	38
PROTECTION OF CRITICAL FACILITIES AND INFRASTRUCTURE .....	39
PREVENTATIVE MAINTENANCE: FLOOD CONTROL INFRASTRUCTURE .....	40
REPETITIVE FLOOD LOSS PROPERTIES.....	41
NEW CONSTRUCTION: FLOOD CONTROL INFRASTRUCTURE .....	42
SURFACE WATER MANAGEMENT PROGRAMS EMERGENCY RESPONSE MANAGEMENT PLAN.....	43
PROTECTION OF ROAD CORRIDORS FROM CHANNEL MIGRATION HAZARDS .....	44
TSUNAMI CRITICAL AREA REGULATION.....	45
<b>PLANNING AND PUBLIC WORKS PUBLIC EDUCATION – MITIGATION MEASURE .....</b>	<b>47</b>
PUBLIC EDUCATION: FLOOD .....	47
<b>PLANNING AND PUBLIC WORKS-TRANSPORTATION DIVISION – MITIGATION MEASURES .....</b>	<b>49</b>
BRIDGE RETROFIT PROGRAM .....	49
<b>ENDNOTES .....</b>	<b>50</b>

## Mitigation Measure Overview

The measures having been identified, defined, and evaluated; the rest of the process involved prioritization. The process relied upon the identified risks and vulnerabilities, the planning team's local expertise, public participation, each organization's needs and capabilities, a cost/benefit review, and input from the chief elected officials. In order to promote implementation of the measures, they were grouped based on the level at which they would be implemented, as described in the Plan Maintenance Section. These levels were:

- **Startup Mitigation Measures:** Those mitigation measures already in existence within the organization and including the maintenance of the Mitigation Plan.
- **Hazard Mitigation Forum (HMF):** Multi-organizational implementation mechanism.
- **Organization-Wide Mitigation Measures:** Mechanism depends on organization.
- **Public Education Mitigation Measures:** Localized level based on targeted communities and their needs and vulnerabilities.

The measures are prioritized within each implementation category. In order to provide consistency, the evaluation process including the eight categories, was used as the basis for the prioritization of measures. This allows for emphasis on the extent to which each measure is cost-effective.

The planning team members from each organization prioritized their organization's potential mitigation measures based on goals addressed with special attention paid to the measure's benefit-cost review, its ability to be implemented, and the extent to which it would mitigate one or multiple relevant hazards.

## Prioritization of Measures

The list was prioritized based on the ongoing work and projects within the individual County Departments. Development is occurring at a rapid pace within the County and the inevitable growth that follows helps and hinders some of the projects and mitigation strategies. We based the County's mitigation measures on what seemed reasonable, possible, and plausible given the abilities and time of the County and its staff members due to the COVID-19 pandemic.

**Table 5-1 Pierce County Mitigation Strategy Matrix**

Implementation Mechanism	Mitigation Measure ( <i>Hazard(s)</i> ) <sup>1</sup>	Lead Jurisdiction(s) / Department(s)	Timeline (years)	Plan Goals					
				Life and Property	Continuity Operations	Partnerships	Natural Resources	Preparedness	Sustainable Economy
<b><u>Startup</u></b>	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	✓	✓	✓	✓	✓	✓
<b><u>HMF</u></b>	3. Pierce County Hazard Mitigation Forum ( <i>E,L,T,V,D,F,WUI,SW, MM</i> )	PC DEM; Local Jurisdictions	Ongoing	✓	✓	✓	✓	✓	✓
<b><u>Emergency Management and Local Jurisdictions</u></b>	1. Underground Infrastructure ( <i>All</i> )	PC DEM; Local Utility Providers	Ongoing	✓	✓	✓			✓
	2. Fire District Annexations ( <i>WUI</i> )	PC DEM; Local Jurisdictions	Ongoing	✓	✓	✓	✓	✓	✓
	3. Create Fire Resilient Communities ( <i>WUI</i> )	PC DEM; Local Jurisdictions	Ongoing	✓	✓	✓	✓	✓	✓
<b><u>Emergency Management</u></b>	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 Operations ( <i>All</i> )	PC DEM	Ongoing		✓	✓			✓
<b><u>Emergency Management Public Education</u></b>	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 Campaigns: All Hazards ( <i>All</i> )	PC DEM	Ongoing	✓				✓	✓
<b><u>Facilities Management</u></b>	1. Critical Infrastructure: Access Limitation Evaluation ( <i>All</i> )	Facilities Management; PC DEM	Ongoing	N/A					
	2. Volcanic Hazards Response and Recovery Standard Operating Procedures ( <i>V</i> )	Facilities Management	Ongoing	✓	✓				
	3. Infrastructure: Response Considerations ( <i>All</i> )	PC Facilities Management PCSD; Fire Districts	Ongoing	N/A					
	4. Sheriff South Hill Precinct: Nonstructural Retrofit ( <i>E</i> )	PC Facilities Management, PC DEM	Ongoing	✓				✓	
<b><u>Information Technology</u></b>	1. Information Technology: Essential Records Protection ( <i>All</i> )	Tacoma Public Works-BLUS	Ongoing		✓				
	2. Pierce County Information Technology Department Fiber Ring ( <i>All</i> )	PC IT	Ongoing		✓				

Implementation Mechanism	Mitigation Measure ( <i>Hazard(s)</i> ) <sup>1</sup>	Lead Jurisdiction(s) / Department(s)	Timeline (years)	Plan Goals					
				Life and Property	Operations Continuity	Partnerships	Natural Resources	Preparedness	Sustainable Economy
	3. Ensure User Connectivity to SAAS Critical Business Systems	PC IT	Short-term		✓				
	4. Support Secure Remote Computing	PC IT	Ongoing		✓				
	5. Protect Existing on Premises Data Center Facilities	PC IT	Long-term		✓				
<b><u>Planning &amp; Public Works-Sewer</u></b>	1. Facility Security Enhancements ( <i>All</i> )	Sewer Division; PC Security	N/A	✓					
	2. Facility Security ( <i>All</i> )	Sewer Division; PC Security	Ongoing	✓			✓		
	3. Day Island Pump Station-Grinder Pump Project	Sewer Division		✓	✓		✓		
	4. Equipment-Portable Godwin pump Station Bypass	Sewer Division		✓			✓		
	5. Streamlined Emergency Communication-Satellite phone systems	Sewer Division	Short-term	✓	✓		✓		
	6. Update Emergency Supplies for On-Site Food, Water and Supplies	Sewer Division	Ongoing	✓	✓		✓		
	7. Emergency Equipment-Boom Truck	Sewer Division	Long-term	✓	✓		✓		
	8. Kapowsin Fire Response Upgrade	Sewer Division	Long-term	✓	✓		✓		
	9. Continuity of Operations Measures ( <i>All</i> )	Sewer Division	Ongoing	✓			✓		
	10. Rehabilitate Sewer System Manholes for longevity and Structural Integrity ( <i>All</i> )	Sewer Division	Ongoing	✓	✓				
<b><u>Planning &amp; Public Works-SWM</u></b>	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	✓			✓		✓

Implementation Mechanism	Mitigation Measure ( <i>Hazard(s)</i> ) <sup>1</sup>	Lead Jurisdiction(s) / Department(s)	Timeline (years)	Plan Goals					
				Life and Property	Operations Continuity	Partnerships	Natural Resources	Preparedness	Sustainable Economy
	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. Protection of Road Corridors from Channel Migration Hazards ( <i>F</i> )	PWU	Ongoing	✓				✓	
	11. Tsunami Critical Area Regulation ( <i>F, T</i> )	PC Planning; PC DEM; Surface Water Management Programs (PC PWU)	Ongoing	N/A					
<b><u>PWU Public Education</u></b>	1. Public Education: Flood ( <i>F</i> )	Surface Water Management Programs (PC PWU); PC DEM	Ongoing		✓		✓		
<b><u>Planning &amp; Public Works-Transportation</u></b>	12. Bridge Retrofit Program ( <i>All</i> )	Transportation Division	Ongoing	✓	✓				✓

# Startup Mitigation Measures

## Existing Mitigation Actions

**Hazards:** E, L, V, D, F, WUI, SW<sup>1</sup>, MM<sup>ii</sup>

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.

*Status Update: 2020 – 2025 Edition*

Complete	Ongoing	Partially Complete	Deferred
	X		
Comments			
<b>This is an ongoing mitigation measure Unincorporated Pierce County intends to keep acting on.</b>			

*Origin*

Previous Plan	Current Plan
X	X

## Plan Maintenance

**Hazards:** E, L, V, D, F, WUI, SW<sup>1</sup>, MM

Pierce County 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.

*Status Update: 2020 – 2025 Edition*

Complete	Ongoing	Partially Complete	Deferred
	X		
Comments			
This is an ongoing mitigation measure Unincorporated Pierce County intends to keep acting on.			

*Origin*

Previous Plan	Current Plan
X	X

# Hazard Mitigation Forum

## Pierce County Hazard Mitigation Forum

**Hazards:** E, L, T, V, D, F, WUI, SW<sup>1</sup>, 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 November. 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.

### *Status Update: 2020 – 2025 Edition*

Complete	Ongoing	Partially Complete	Deferred
	X		
Comments			
<p><b>This is an ongoing mitigation strategy that is held every year in November. The 2019 Mitigation Forum was held in January of 2020 due to the update of the plan during 2019. Both WA-EMD and FEMA Region X were invited as guest speakers providing jurisdictions added information on the mitigation program and the opportunity to meet and ask questions of them.</b></p>			

### *Origin*

Previous Plan	Current Plan
X	X

# Emergency Management and Local Jurisdictions – Mitigation Measures

## 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.

*Status Update: 2020 – 2025 Edition*

Complete	Ongoing	Partially Complete	Deferred
	X		
Comments			
Utility companies continue to underground power lines where it is economically feasible for them.			

*Origin*

Previous Plan	Current Plan
X	X

## Fire District Annexations

Hazards: WUI

The County will continue to encourage rural residents to annex to or join nearby local fire protection districts. This will transfer fire response capabilities to rural communities and increase funds available for firefighting services at the local level. In some area’s 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.

*Status Update: 2020 – 2025 Edition*

Complete	Ongoing	Partially Complete	Deferred
<b>Comments</b>			

*Origin*

Previous Plan	Current Plan

## Create Fire Resilient Communities

Hazards: WUI

The County will continue to promote delivery of Firewise USA® training and workshops in high hazard areas of Pierce County, in collaboration with fire protection districts, residents, land use planners, and others. Each participating site develops an action plan containing a prioritized list of risk reduction projects/investments specific to their communities. The National Fire Protection Association provides this voluntary incentive program for communities and individuals to learn how to recognize, evaluate, and reduce wildfire risks. The workshops gather private and public sector interests including architects, bankers, fire prevention professionals, insurance representatives, developers, 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.

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.

*Status Update: 2020 – 2025 Edition*

Complete	Ongoing	Partially Complete	Deferred
	X		
Comments			
<p><b>This has largely been promoted through the Fire Districts. As climate change alters weather patterns and increases WUI risk PC-EM will coordinate efforts to work more with Fire Districts and communities to incorporated elements of the Community Wildfire Protection Plan into the mitigation plan of jurisdictions with a high risk for WUI. This will also promote the development of more Firewise communities within Pierce County.</b></p>			

*Origin*

Previous Plan	Current Plan
X	X

# 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.

*Status Update: 2020 – 2025 Edition*

Complete	Ongoing	Partially Complete	Deferred
	X		
Comments			
The Hazard Mitigation Committee group plans to meet semiannually to work on the plan and smaller sub-groups may form to continue to work on isolated projects between County Departments.			

*Origin*

Previous Plan	Current Plan
X	X

## All-Hazards Mitigation Plan

Hazards: All

The County will continue to maintain and update 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 2020 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.

*Status Update: 2020 – 2025 Edition*

Complete	Ongoing	Partially Complete	Deferred
	X		
Comments			
The County continues to maintain and update their All Hazards Mitigation Plan. The Hazard Mitigation Committee group plans to meet semiannually to work on the plan and smaller sub-groups may form to continue to work on isolated projects between County Departments.			

*Origin*

Previous Plan	Current Plan
X	X

## Continuity of Operations

Hazards: All

As part of continuity planning with county departments and cities/towns, Pierce County DEM incorporates mitigation strategies into Continuity of Operations (COOP) programs and plans. Through continuity planning, an organization demonstrates the need for their critical facilities by identifying and prioritizing their essential functions; establishing what services have to be provided, with what personnel, at what locations, and with what resources. Physical mitigation strategies that increase the resilience of an organization and reduce disruption to essential functions include: (1) implementing structural changes, such as elevating facilities, flood proofing, or implementing earthquake retrofitting measures; (2) hardening infrastructure, including implementing security measures for facilities, systems, and applications or re-rerouting utilities underground; and (3) creating redundancy, such as installing a generator. For example, the building containing the DEM main offices and Tacoma-Pierce County Emergency Operations Center also contains the Pierce County Elections Center, evidence storage for the Pierce County Sheriff’s Department, and the data center providing most of the telecommunications capabilities for county government. The capabilities of these facilities are

critical for continuing fundamental public services that reduce threats to life, public health and safety, or improved property. Additionally, these facilities have a role in preserving of our form of government (maintaining elected civilian leadership and integrity of criminal investigations and court proceedings).

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 is likely to be endorsed by the entire community.

*Status Update: 2020 – 2025 Edition*

Complete	Ongoing	Partially Complete	Deferred
	X		
Comments			
<p><b>During 2017-2018 Pierce County Emergency Management partnered with other county departments, cities/towns, tribe, and other local jurisdictions to update the Departmental COOP Plans and CEMP plan. This is an ongoing dynamic process and as events/incidents occur these plans are reviewed and revised if necessary.</b></p>			

*Origin*

Previous Plan	Current Plan
X	X



# Emergency Management Public Education

## 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.

*Status Update: 2020 – 2025 Edition*

Complete	Ongoing	Partially Complete	Deferred
	X		
Comments			
This is an ongoing effort and is achieved through a variety of outreach efforts such as the PC-NET program, fairs, and community events.			

*Origin*

Previous Plan	Current Plan
X	X

## 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.

*Status Update: 2020 – 2025 Edition*

Complete	Ongoing	Partially Complete	Deferred
	X		
Comments			
<p>This is an ongoing effort and is achieved through a variety of outreach efforts such as the PC-NET program, fairs, and community events. Pierce County partners with the City of Orting and the Orting School District for their annual Lahar Evacuation Drill. Currently in 2020 the sirens are being upgraded in the lahar valleys and community outreach is occurring to education the public to the new siren system. May is designated as Volcano Preparedness Month.</p>			

*Origin*

Previous Plan	Current Plan
X	X

## 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.

*Status Update: 2020 – 2025 Edition*

Complete	Ongoing	Partially Complete	Deferred
	X		

Comments
<b>This is an ongoing effort and is achieved through a variety of outreach efforts such as the PC-NET program, fairs, and community events. Pierce County Emergency Management partners with USGS and other local jurisdictions in promoting education and awareness around lahar and volcanic ashfall.</b>

*Origin*

Previous Plan	Current Plan

## 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.

*Status Update: 2020 – 2025 Edition*

Complete	Ongoing	Partially Complete	Deferred
Comments			
<b>This is an ongoing effort and is achieved through a variety of outreach efforts such as the PC-NET program, fairs, and community events, school presentations, rotary clubs just to name a few.</b>			

*Origin*

Previous Plan	Current Plan
X	X

# 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.

*Status Update: 2020 – 2025 Edition*

Complete	Ongoing	Partially Complete	Deferred
	X		
Comments			
This continues to be an ongoing strategy for Pierce County, and we are carrying this measure forward with this update.			

*Origin*

Previous Plan	Current Plan
X	X

## 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.

*Status Update: 2020 – 2025 Edition*

Complete	Ongoing	Partially Complete	Deferred
	X		
Comments			
This has been an ongoing effort and the goal is complete this strategy in 2021.			

*Origin*

Previous Plan	Current Plan
X	X

## 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.

*Status Update: 2020 – 2025 Edition*

Complete	Ongoing	Partially Complete	Deferred
	X		
Comments			
This continues to be an ongoing strategy for Pierce County, and we are carrying this measure forward with this update.			

*Origin*

Previous Plan	Current Plan
X	X

## 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.

*Status Update: 2020 – 2025 Edition*

Complete	Ongoing	Partially Complete	Deferred
		X	
Comments			
The lightening is complete, and we continue to work on the nonstructural seismic retrofit to include securing and bracing HVAC, ductwork, and ceiling systems.			

*Origin*

Previous Plan	Current Plan
X	X

# 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.

*Status Update: 2020 – 2025 Edition*

Complete	Ongoing	Partially Complete	Deferred
	X		
Comments			
We continue to ensure that all electronic essential records are stored in appropriately secure and resilient technology environments, including data backups and data recovery plans. During the 2020-21 biennium we are planning to implement improved redundant data center facilities to improve resiliency of internally hosted records systems. An outstanding risk area involves paper-only documents (typically older) for which no backups exist. We will support department efforts to identify and create digital copies of these documents.			

*Origin*

Previous Plan	Current Plan
X	X

## 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, maintenance and operations.
3. **Funding Source and Situation** = Funding could be obtained through local budget or grants or through cooperative interagency contributions for this shared infrastructure.
4. **Lead Department(s)** = Finance - 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.

*Status Update: 2020 – 2025 Edition*

Complete	Ongoing	Partially Complete	Deferred
	X		
Comments			
<p>The County will continue to ensure the protection of the fiber ring used by Pierce County, and managed by Finance - Information Technology, for interconnecting all departments to the County information systems and internet. Pierce County shares 24 pairs of fiber with City of Tacoma agencies, Tacoma Pierce County Health Department, and LESA/South Sound 911. Pierce County uses 2 of the 24 pairs for Pierce County network connectivity. During the 2020-21 biennium, surveys and research are planned to determine what, if any investments, need to be budgeted to repair or replace this fiber which was installed in 1992</p>			

*Origin*

Previous Plan	Current Plan
X	X

## Ensure User Connectivity to SAAS Critical Business Systems

Hazards: All

Establish infrastructure and process to ensure connectivity to critical SAAS applications.

1. **Goal(s) Addressed** = Ensure Continuity of Operations
2. **Cost of Measure** = Staff time, cost of cloud-based MFA solution.
3. **Funding Source and Situation** = Funding could be obtained through local budget or state and federal grants.
4. **Lead Department(s)** = Pierce County Finance-Information Technology
5. **Timeline** = Short-term – within 1 to 2 years
6. **Benefit** = all Pierce County Department employees.
7. **Life of Measure** = Perpetual
8. **Community Reaction** = The proposal would benefit those affected, with no adverse reaction from others.

*Status Update: 2020 – 2025 Edition*

Complete	Ongoing	Partially Complete	Deferred



	X		
Comments			
This is a new mitigation strategy.			

*Origin*

Previous Plan	Current Plan
	X

## Support Secure Remote Computing

Hazards: All

Assess and support secure remote computing in the event of loss of workplace or another emergency.

1. **Goal(s) Addressed** = Ensure Continuity of Operations
2. **Cost of Measure** = Staff time and hardware to implement.
3. **Funding Source and Situation** = Funding could be obtained through local budget or federal and state grants.
4. **Lead Department(s)** = PC Information Technology
5. **Timeline** = Ongoing
6. **Benefit** = This is critical to all Pierce County employees as defined by Department COOP plans.
7. **Life of Measure** = Perpetual
8. **Community Reaction** = The proposal would benefit those affected, with no adverse reaction from others.

*Status Update: 2020 – 2025 Edition*

Complete	Ongoing	Partially Complete	Deferred
	X		
Comments			
This is a new mitigation strategy.			

*Origin*

Previous Plan	Current Plan
	X

## Protect Existing on Premises Data Center Facilities

Hazards: All

Regularly assess potential weaknesses in on premises environment and establish secondary data center as a failover option.

**Goal(s) Addressed** = Ensure Continuity of Operations

1. **Cost of Measure** = Staff time, secondary site operational costs, secondary site equipment costs.

2. **Funding Source and Situation** = Funding could be obtained through local budget or state and federal grants.
3. **Lead Department(s)** = Pierce County Finance-Information Technology
4. **Timeline** = Long-term
5. **Benefit** = all Pierce County Department employees and the public indirectly.
6. **Life of Measure** = Perpetual
7. **Community Reaction** = The proposal would benefit those affected, with no adverse reaction from others.

*Status Update: 2020 – 2025 Edition*

Complete	Ongoing	Partially Complete	Deferred
	X		
Comments			
This is a new mitigation strategy.			

*Origin*

Previous Plan	Current Plan
	X

# Planning and Public Works-Sewer Chambers Bay Wastewater Treatment Plant (WWTP) Mitigation Measures

## 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.

*Status Update: 2020 – 2025 Edition*

Complete	Ongoing	Partially Complete	Deferred
	X		
Comments			
<b>Portions of this effort are complete; however, security is an ongoing effort for the Sewer Division. The Division took over operation of an additional treatment facility, Cascadia at Tehaleh, and these measures will need to be addressed there as well.</b>			

### *Origin*

Previous Plan	Current Plan
X	X

## Facility Security

Hazards: E, V, CD, MM

Security fencing round the UV system and installation of Lenel security doors.

1. **Goal(s) Addressed** = Protect Life and Property; Protect Environment; Ensure Continuity of Operations.
2. **Cost of Measure** = \$90,000
3. **Funding Source and Situation** = Annual budget, or state and federal grant funds.
4. **Lead Jurisdiction(s)** = Sewer Division (PC PPW)
5. **Timeline** = Long-term
6. **Benefit** = Enhanced protection for multi-million-dollar facility and infrastructure and 60 CCRWWTP employees
7. **Life of Measure** = Perpetual
8. **Community Reaction** = the proposal would benefit those affected, with no adverse reaction from others.

*Status Update: 2020 – 2025 Edition*

Complete	Ongoing	Partially Complete	Deferred
Comments			
This is a new mitigation strategy.			

*Origin*

Previous Plan	Current Plan
	X

## Day Island Pump Station-Grinder Pump Project

Hazards: E, T F, SW, CC, P

The Day Island pump station and wet/dry wells are below sea level during certain parts of the day. Installing grinder pumps at homes and at the Marina would allow for removal of the antiquated underwater and beach lines.

1. **Goal(s) Addressed** = Protect Life and Property; Public Safety; Protect Environment; Ensure Continuity of Operations.
2. **Cost of Measure** = \$2,500,000
3. **Funding Source and Situation** = State or Federal grants or other State sources.
4. **Lead Jurisdiction(s)** = Pierce County Planning and Public Works-Sewer Division
5. **Timeline** = Long-term
6. **Benefit** =
7. **Life of Measure** = 50 years
8. **Community Reaction** = The proposal would benefit those affected, with no adverse reaction from others.

Objectives:

- Would remove the possibility of leakage from homes and lines into the Puget Sound;
- would be easier, cheaper and more efficient to maintain the line;
- access to lines and manholes are restricted by tide and sand shifting;
- and rising sea levels impact beach lines.

*Status Update: 2020 – 2025 Edition*

Complete	Ongoing	Partially Complete	Deferred
Comments			
This is a new mitigation measure.			

*Origin*

Previous Plan	Current Plan
	X

## Equipment-Portable Godwin Pump Station Bypass

Hazards: E, L, T, V, F, SW, CC, EE, P, MM, HM

This piece of equipment is used in situations where a sewer line or force main is damaged. It allows for flow to bypass the damaged area.

1. **Goal(s) Addressed** = Protect Life and Property; Public Safety; Protect Environment; Ensure Continuity of Operations.
2. **Cost of Measure** = \$50,000
3. **Funding Source and Situation** = State or Federal grants or other State sources.
4. **Lead Jurisdiction(s)** = Pierce County Planning and Public Works-Sewer Division
5. **Timeline** = Long-term
6. **Benefit** = Benefits the public/jurisdictions throughout Pierce County where broken lines are possible.
7. **Life of Measure** = Perpetual but is a onetime purchase.
8. **Community Reaction** = The proposal would benefit those affected, with no adverse reaction from others.

Objectives:

- Allows sewage flows to bypass a damaged force main or sewer line and continue to the treatment facility;
- Can help mitigate a spill helping to reduce health issues due to sewage exposure.

*Status Update: 2020 – 2025 Edition*

Complete	Ongoing	Partially Complete	Deferred
Comments			
This is a new mitigation strategy.			

*Origin*

Previous Plan	Current Plan
	X

## Streamlined Emergency Communications-Satellite phone systems

Hazards: E, T, V, D, F, SW, TA, CC, CD, EE, P, MM, HM

The Sewer Division is spread between four separate locations. In an emergency it is integral to communicate to all places.

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 would benefit those affected, with no adverse reaction from others.

Objectives:

- Communication-all four facilities could communicate during major events;
- The Sewer Division could assist responders with communication across the country;
- Response time could be shortened if communication is not disrupted.

*Status Update: 2020 – 2025 Edition*

Complete	Ongoing	Partially Complete	Deferred
Comments			
This is a new mitigation strategy.			

*Origin*

Previous Plan	Current Plan
	X

## Update Emergency Supplies for On-Site Food, Water, and Supplies

Hazards: E, T, V, D, SW, CC, E, EE, MM

The Sewer Division maintains water, food, emergency sleeping bags and other necessary supplies on-site in case of a major emergency. Some of these supplies are aging and need to be replaced.

1. **Goal(s) Addressed** = Protect Life and Property; Public Safety; Protect Environment; Ensure Continuity of Operations.
2. **Cost of Measure** = \$4,000
3. **Funding Source and Situation** = Annual budget or state or federal grants.
4. **Lead Jurisdiction(s)** = Pierce County Planning & Public Works-Sewer Division.

5. **Timeline** = On-going
6. **Benefit** = At the CCRWWTP it will directly benefit 60 employees and related county 20 employee staff. Indirectly it will benefit approximately 20 visitors.
7. **Life of Measure** = Perpetual
8. **Community Reaction** = The proposal would benefit those affected, with no adverse reaction from others.

Objectives:

- Supplies will allow Sewer Division staff to be housed on-site in case of a major disaster;
- Supplies will help in case members of the public try to shelter at the facility;
- Allows staff to assist other County responders when necessary
- Water is currently rotated out to assist on high heat index days. This may occur more frequently in the future.

*Status Update: 2020 – 2025 Edition*

Complete	Ongoing	Partially Complete	Deferred
Comments			
This is a new mitigation strategy.			

*Origin*

Previous Plan	Current Plan
	X

## Emergency Equipment-Boom Truck

Hazards: E, T, V, F, TA, CC, CD, P, HM

The Sewer Division would purchase a boom truck for emergencies. This piece of equipment would allow us to have a truck in two separate locations with the ability to support the entire sewer service area.

1. **Goal(s) Addressed** = Protect Life and Property; Public Safety; Protect Environment; Ensure Continuity of Operations.
2. **Cost of Measure** = \$175,000
3. **Funding Source and Situation** = Annual budget or state or federal grants.
4. **Lead Jurisdiction(s)** = Pierce County Planning & Public Works-Sewer Division.
5. **Timeline** = Long-term
6. **Benefit** = This would have a direct benefit on Pierce County Public Works and would also have an indirect benefit on the surrounding jurisdictions.
7. **Life of Measure** = Perpetual
8. **Community Reaction** = The proposal would benefit those affected, with no adverse reaction from others.

Objectives:

- A boom truck is a necessary in most emergency situations;
- Inter-local agreements could be made to help other jurisdictions;
- We have geographical challenges due to our large service area and the potential for I-5 dividing our districts.

*Status Update: 2020 – 2025 Edition*

Complete	Ongoing	Partially Complete	Deferred
Comments			
This is a new mitigation strategy.			

*Origin*

Previous Plan	Current Plan
	X

## Kapowsin Fire Response Upgrade

Hazards: E, V, D, SW, WUI

This project would upgrade the fire flow system associated with the Kapowsin Water District to acceptable standards.

1. **Goal(s) Addressed** = Protect Life and Property; Public Safety; Protect Environment; Ensure Continuity of Operations.
2. **Cost of Measure** = \$240,000
3. **Funding Source and Situation** = State or federal grants.
4. **Lead Jurisdiction(s)** = Pierce County Planning & Public Works-Sewer Division acting as Receiver for Kapowsin Water District
5. **Timeline** = Long-term
6. **Benefit** = Directly benefits the residents connected to the Kapowsin Water System. Indirectly benefits the surrounding community by providing a place for Graham Fire to re-fill equipment.
7. **Life of Measure** = Perpetual
8. **Community Reaction** = The proposal is likely to be endorsed by the entire community.

Objectives:

- This project would help with safety and security to the public now and into the future during an emergency;
- his upgrade would bring the system into compliance with current standards.

*Status Update: 2020 – 2025 Edition*

Complete	Ongoing	Partially Complete	Deferred
Comments			
This is a new mitigation strategy.			



*Origin*

Previous Plan	Current Plan
	X

## 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.

*Status Update: 2020 – 2025 Edition*

Complete	Ongoing	Partially Complete	Deferred
	X		
Comments			
<b>This continues to be an ongoing strategy that we must always be prepared to activate.</b>			

*Origin*

Previous Plan	Current Plan

# 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.

## *Status Update: 2020 – 2025 Edition*

Complete	Ongoing	Partially Complete	Deferred
	X		
Comments			
This is an ongoing maintenance issue.			

## *Origin*

Previous Plan	Current Plan

# Planning and Public Works-SWM – 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. This leads to more accurate implementation of floodplain regulations and an opportunity to increase public awareness. In the next five years Pierce County seeks to update flood studies and floodplain maps for the Nisqually River, Muck Creek, South Creek, and areas with levees that had been secluded from the 2017 DFIRM and incorporate the results into the effective DFIRM. Additionally, letters of map change will be sought where better LiDAR based topography can improve the mapped area and when capital project make significant changes in the floodplain.

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 Risk Map program PPW-SWM.
4. **Lead Department(s)** = Surface Water Management Program (PC PPW) with FEMA
5. **Timeline** = Ongoing
6. **Benefit** = County-Wide
7. **Life of Measure** = Life of Flood Insurance Program
8. **Community Reaction** = 95% of the county is not in a high-risk hazard so the majority will not see this as affecting them. A small percentage will now be shown in a lower flood risk zone and be quite pleased that their flood insurance cost can be greatly reduced. Another small percentage will be notified the flood risk is greater than previously thought and see increased insurance cost and requirements.

### *Status Update: 2020 – 2025 Edition*

Complete	Ongoing	Partially Complete	Deferred
	X		
Comments			
<p>On March 7, 2017, the Digital Flood Insurance Rate Maps (DFIRM) became the official flood maps for Pierce County. These new maps, with studies from the early 2000’s, replaced flood hazards that were developed in the late 1970’s. The new maps are more accurate and include coastal properties. However, properties adjacent to leveed rivers in Pierce County were “secluded” from the update meaning insurance rates are still based on the information from the original 1970s-era maps. Unincorporated Pierce County regulates these secluded areas with best available data. This can lead to confusion by property owners as FEMA’s maps and surrounding communities don’t use this better data.</p>			

*Origin*

Previous Plan	Current Plan
X	X

## Channel Migration Zone Mapping

Hazards: F

Pierce County experiences two major types of hazards associated with flooding; flood inundation and erosion. 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 has sponsored geomorphic studies which identify areas with low, moderate and severe risk of riverine erosion or channel migration. The County regulates the severe areas under our floodway code that greatly limits development in these areas. The County currently has adopted channel migration zone maps for the Puyallup, Carbon, Lower White, Upper Nisqually Rivers and South Prairie Creek. The County will continue to work to develop and adopt channel migration maps for all its major rivers that include the 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 Program (PC PPU)
5. **Timeline** = Ongoing
6. **Benefit** = County-Wide
7. **Life of Measure** = perpetual
8. **Community Reaction** = The studies have endorsed by the majority of the community once fully informed. Homeowners with structures at severe risk of migration have a mixed reaction to this newly mapped hazard. These range from acceptance, denial, to a variant of “why didn’t you tell me sooner?”

*Status Update: 2020 – 2025 Edition*

Complete	Ongoing	Partially Complete	Deferred
		X	
Comments			
Channel Migration Zone (CMZ) studies for Upper Nisqually and South Prairie Creek were recently adopted as part of Digital Flood Insurance Rate Map (DFIRM) ordinance. new channel migration zone study was completed in 2017 for the Greenwater River. Currently, Pierce County Surface Water Management is conducting a study for the Upper White River that scheduled to be completed in 2020 after which both will be presented to County Council for adoption.			

*Origin*

Previous Plan	Current Plan
X	X

## 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 PPW)
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.

*Status Update: 2020 – 2025 Edition*

Complete	Ongoing	Partially Complete	Deferred
	X		
Comments			
<p>The Maintenance and Operations Division (M&amp;O) has developed Rapid Damage Assessment protocols (RDA) that are paired with the Division’s Emergency Response program. If Pierce County experiences flooding, wind/ice storms, lahars, earthquakes, wildfire, or landslides, M&amp;O will implement the RDA protocols and subsequently assess the affected public infrastructure. Response times will vary based on the individual severity and location of each event, but generally RDA’s can be activated within 24 hours, if warranted. RDA teams will be dispatched 24 hours/day by the assigned Incident Commander and the assessment teams will provide a continuous flow of real-time assessment data to Incident Command and the Department of Emergency Management’s Emergency Operations Center (EOC). Data is collected in the field using iPads, Unmanned Aerial Vehicles (drones), or mobile GPS devices. Most commonly, the assessment data is collected on iPads equipped with the Arc GIS Online geospatial application, which allows RDA teams to collect point, line, or polygon data with associated attribute information describing the extent and severity of the affected/damaged locations. Assessment data is also relayed to the EOC and other emergency response agencies by using “WebEOC” software, which is also a geospatial database designed to display real-time crisis information. Upon collection of the assessment data, Incident Command will dispatch M&amp;O work crews to respond with repairs or risk reduction efforts. Assessment teams, M&amp;O work crews, and Incident Command staff are trained annually to ensure they can respond safely and efficiently.</p>			

*Origin*

Previous Plan	Current Plan
X	X

## 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. Construction of setback levees will also reduce future maintenance needs at those locations. 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 PPW)
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.

*Status Update: 2020 – 2025 Edition*

Complete	Ongoing	Partially Complete	Deferred
Comments			
Pierce County operates and maintains 69 miles of levees and revetments. There was a Levee Set-Back Feasibility Study completed in 2008 which included 32 levee sites. In 2014, this study was updated to re-rank the locations considering a fish habitat component. The study was revisited to include the Clear Creek floodplain reconnection in 2019. During the update of the 2023 Pierce County Rivers Flood Hazard Management Plan, Surface Water Management will update the Levee Set-Back Feasibility Study. The updated Levee Set-back Feasibility Study will provide a status on the original 32 levee sites and include incorporating additional sites to the original setback locations.			

*Origin*

Previous Plan	Current Plan
X	X

## 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.

*Status Update: 2020 – 2025 Edition*

Complete	Ongoing	Partially Complete	Deferred
		X	
Comments			
<p>North Levee Road Setback levee: This project is a part of the United States Army Corps of Engineers (USACE), Seattle District Office General Investigation study for the Puyallup River Basin. As of January 2018, the USACE completed a draft report called the Integrated Feasibility Report and Environmental Impact Statement. This draft report went through a public review and comment period in April 2016. At this time, this project is currently on hold and USACE has dropped the general Investigation.</p> <p>Tacoma Wastewater Treatment Plant Flood Wall: The City of Tacoma designed a floodwall with automatic gates at vehicle entrances and an emergency pump station inside the Central Wastewater Treatment Plant. This project earned the American Public Works Association 2016 Public Works Project of the Year Award. It was completed a few years ago and it won a National American Public Works Association award in 2016 for Public Works project of the year.</p>			

Puyallup Wastewater Treatment Plant Flood Wall: This project was designed to protect the City of Puyallup’s Water Pollution Control Plant (WPCP). In lieu of constructing a wall around the plant, the City decided it was more efficient to provide protection through a combination of flood proofing and elevation of critical infrastructure within the plant. This project began construction in October 2017 and was completed in 2018.

Oxbow Lake Flooding/Sewer Lift Station Protection

South Prairie Fire Station flood protection: Flood valves on the storm drains in the Fire station were installed and the project is complete.

Mashel River Bridge Scour

*Origin*

Previous Plan	Current Plan
X	X

**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.

*Status Update: 2020 – 2025 Edition*

Complete	Ongoing	Partially Complete	Deferred
	X		
Comments			
The System Wide Infrastructure Framework (SWIF) levee management strategy represents Pierce County’s local approach to improving the system of levees by addressing identified levee deficiencies, including the correction of unacceptable			



inspection items in a prioritized manner to optimize flood risk reduction. Levees will be inspected annually to identify maintenance deficiencies based on current or evolving conditions. Those deficiencies determined to be unacceptable will be evaluated for level of risk associated with the levee segment. Corrective actions will be prioritized on the basis of potential consequences if the deficiency is left uncorrected. Levee deficiencies with the greatest potential consequences will be corrected first. Identified deficiencies posing a lower and tolerable risk will be monitored and IRRMs implemented as appropriate. Deficiencies that directly affect the structural integrity of the levee will be listed as a high priority and scheduled for correction based on level of risk.

Deficiencies will be addressed through the levee maintenance program, the capital maintenance program, the capital improvement program or engineering analysis. Structural and non-structural interim flood risk reduction measures will be implemented as needed to address identified levee deficiencies where maintenance or capital improvement action is needed by implementation is delayed. Measures to address levee segments exhibiting chronic maintenance problems and areas of highest risk are addressed with appropriate corrective actions to reduce repetitive damage. Corrective actions are prioritized as near term, mid-term, and long-term, based on the severity of the deficiency and the prioritization schedule (determined by level of risk and available resources). Postponed corrective actions will be monitored, with interim risk reduction measures applied as appropriate. Interim risk reduction measures (IRRM) may include non-structural measures such as evacuation plans, public notices and alerts, or may include structural solutions such as placement of temporary sandbags to offset the risk until such time a long-term solution is implemented.

*Origin*

Previous Plan	Current Plan
X	X

---

## Repetitive Flood Loss Properties

Hazards: F

The County will continue to seek grant funding for 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. The County, State and FEMA use different definitions of repetitive loss which can lead to some confusion during funding discussions, but all seek to incentivize removal of repeated flood damaged structures. The County continues to develop a comprehensive property management plan that outlines use options of acquired properties. The primary goal is to prevent development or redevelopment in flood hazard areas of acquired properties and uses tools such as open space dedications in perpetuity or incorporation into a flood reduction project.

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** = County REET Fund; private funding where applicable; public grant sources including FEMA HMGP, PDM and WA FCAAP Grants; appropriations from local, state or federal agencies for specific projects.
4. **Lead Department(s)** = Surface Water Management (PC PPW)
5. **Timeline** = Long-term
6. **Benefit** = County-Wide (recent targeted areas include: Clear Creek, Clover Creek, Upper Puyallup River and middle Nisqually River)
7. **Life of Measure** = perpetual
8. **Community Reaction** = The proposal is likely to be endorsed by the entire community.

*Status Update: 2020 – 2025 Edition*

Complete	Ongoing	Partially Complete	Deferred
	X		
Comments			
Since September 2014, Pierce County Surface Water Management has acquired and demolished 60 structures that qualify as primary flood prone structures. An additional 39 barns, detached garages and outbuildings were also removed from the floodplain.			

*Origin*

Previous Plan	Current Plan
X	X

---

## 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
- **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

*Status Update: 2020 – 2025 Edition*

Complete	Ongoing	Partially Complete	Deferred
	X		
Comments			
<p><b>Property Acquisition:</b> Clear Creek, Clover Creek, Nisqually River Repetitive Flood Loss Areas</p> <p><b>Setback Levees:</b> Several setback levee project along the Puyallup, Carbon and White Rivers</p> <p><b>Culvert Replacements and Property Acquisitions:</b> Clover Creek Repetitive Flood Loss Area</p> <p><b>Retention/Detention Ponds:</b> Clear Creek, Clover Creek, Nisqually River Repetitive Flood Loss Areas</p> <p><b>Permanent Pump Station:</b> Clear Creek Repetitive Flood Loss Area</p> <p><b>Setback Levees:</b> Clear Creek Repetitive Flood Loss Area</p> <p><b>Culvert Replacements:</b> Clover Creek Repetitive Flood Loss Area</p>			

*Origin*

Previous Plan	Current Plan
X	X

---

## 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.

*Status Update: 2020 – 2025 Edition*

Complete	Ongoing	Partially Complete	Deferred
	X		
Comments			
Surface Water Management updates the Surface Water Management Emergency Response Plan annually. In 2018, this document was updated to include additional elements such as a Maintenance & Operations section, a Quarry section, and an Emergency Management section.			

*Origin*

Previous Plan	Current Plan
X	X

## 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 Levee Removal
- 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.

*Status Update: 2020 – 2025 Edition*

Complete	Ongoing	Partially Complete	Deferred
	X		

### Comments

Orville Road Channel Migration Protection: This project is currently under construction and will be completed in multiple phases. The Orville Road Setback revetment project seeks to protect approximately two miles of Orville Road between River Mile 28.2 and 26.4. The project will construct setback revetment consisting of engineered logs jams to resist Puyallup River left bank channel migration that threatens the road. At the closest point, the river channel is about 200 feet away from Orville Road. This project will be constructed at three separate locations. Due to the size and cost of the overall project it will require between five and seven phases to complete. Construction of Phase 1 was completed in 2013. Phase 2A construction was completed in 2018. Construction of Phase 2B was completed at the end of 2019. Final design on a fourth phase (Phase 2C) will be completed in 2020, with construction for this phase scheduled for 2020 and 2021. Preliminary design on a fifth phase will begin in 2020 with construction tentatively scheduled for 2023.

Neadham Road Levee Removal: This project is currently in the property acquisition and design phase. When this project is complete, it will remove 3700 liner feet of levee allowing the river to reconnect with the floodplain. The project will remove all residences along Neadham Road, abandon and remove Neadham Road and remove all manmade alterations that would affect floodplain reconnection. The project is located on the right bank Upper Puyallup River between RM 25.5 and 26.8 south of Orting.

Neadham Road is proposed to be abandoned and removed entirely to the intersection of Brooks Road. This will allow the river to access its full historical right bank floodplain for the first time in a century. This project will ultimately result in the reconnection of 1.3 miles of uninterrupted floodplain and riparian area along the right bank of the Puyallup River.

Upper Carbon/Fairfax Road Channel Migration Protection: No project update at this time.

---

## 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.

*Status Update: 2020 – 2025 Edition*

Complete	Ongoing	Partially Complete	Deferred
	X		
Comments			
<p>Tsunami and Seiche Hazard Areas area regulated under the Pierce County Code 18E .90.040 and 18E.70 and are defined as areas that are designated “A” or “V” zones as defined by FEMA. New maps for flood hazards, including a more detailed coastal hazard map was adopted by Pierce County March 2017. These maps area regulated under Pierce County Code 18E.70 Flood Hazard Areas. As new more detailed maps for tsunamis inundation mapping are developed, these maps may be used in determining flood hazard information as best available data as allowed for under 18E.70.020.2 and 18E.10.140.H.3</p>			

*Origin*

Previous Plan	Current Plan
X	X

# Planning and Public Works Public Education – Mitigation Measure

## Public Education: Flood

Hazards: F

The County will continue and expand the Surface Water Management Communication 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 prepare and respond to floods including the availability of insurance to provide financial protection and quicker recovery.
- 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.

*Status Update: 2020 – 2025 Edition*

Complete	Ongoing	Partially Complete	Deferred
	X		
Comments			
Surface Water Management mails two sets of approximately 15,000 postcards out to property owners with land in the floodplains each year just before flood season. An initial postcard discusses a specific flooding source and a follow up postcard is sent out concurrent with a forecasted rain event to remind residents to contact Pierce County Surface Water Management to determine their flood risk.			

*Origin*

Previous Plan	Current Plan
X	X



# Planning and Public Works-Transportation Division – Mitigation Measures

---

## 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.

### *Status Update: 2020 – 2025 Edition*

Complete	Ongoing	Partially Complete	Deferred
	X		
Comments			
The Department completes an Engineer’s Bridge Inspection Report on an annual basis. This report provides details on each bridge location and their specific needs. This report should be referenced when information on this program is required.			

### *Origin*

Previous Plan	Current Plan
X	X

---

# Endnotes

<sup>1</sup> Hazard Codes:

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

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

<sup>ii</sup> 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.