Thurston County Annex to the
Hazards Mitigation Plan for the Thurston Region

June 13, 2017

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Placeholder for Adopting Resolution
Annex: Thurston County

<table>
<thead>
<tr>
<th>Community Profile: Thurston County</th>
<th>Information: (360) 754-3800 <a href="http://www.co.thurston.wa.us">www.co.thurston.wa.us</a></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Population, 2000</strong></td>
<td>207,355</td>
</tr>
<tr>
<td><strong>Population, 2010</strong></td>
<td>252,264</td>
</tr>
<tr>
<td><strong>Population, 2016</strong></td>
<td>272,700</td>
</tr>
<tr>
<td><strong>Avg. Ann. Pop. Growth, 2000-2010</strong></td>
<td>2.0%</td>
</tr>
<tr>
<td><strong>Avg. Ann. Pop. Growth, 2010-2016</strong></td>
<td>1.6%</td>
</tr>
<tr>
<td><strong>Households, 2010</strong></td>
<td>100,650</td>
</tr>
<tr>
<td><strong>Avg. Household Size, 2010</strong></td>
<td>2.46</td>
</tr>
<tr>
<td><strong>Age Structure, 2010:</strong></td>
<td></td>
</tr>
<tr>
<td>17 and under</td>
<td>58,122</td>
</tr>
<tr>
<td>18 - 64</td>
<td>161,378</td>
</tr>
<tr>
<td>65 and over</td>
<td>32,764</td>
</tr>
<tr>
<td>Median Age</td>
<td>39</td>
</tr>
<tr>
<td><strong>Race and Ethnicity, 2010:</strong></td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>207,856</td>
</tr>
<tr>
<td>Black/African American</td>
<td>6,752</td>
</tr>
<tr>
<td>American Indian &amp; Alaska Native</td>
<td>3,515</td>
</tr>
<tr>
<td>Asian</td>
<td>13,037</td>
</tr>
<tr>
<td>Native Hawaiian &amp; Other Pacific Islander</td>
<td>1,961</td>
</tr>
<tr>
<td>Other Race</td>
<td>5,648</td>
</tr>
<tr>
<td>Two or More Races</td>
<td>13,495</td>
</tr>
<tr>
<td><strong>Hispanic or Latino (Of Any Race), 2010:</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>17,787</td>
</tr>
<tr>
<td><strong>Housing, 2016 Estimate:</strong></td>
<td></td>
</tr>
<tr>
<td>Single-Family</td>
<td>76,400</td>
</tr>
<tr>
<td>Multifamily</td>
<td>25,600</td>
</tr>
<tr>
<td>Manufactured Homes</td>
<td>13,200</td>
</tr>
<tr>
<td><strong>Average House Sale Price, 2014:</strong></td>
<td>$247,828</td>
</tr>
<tr>
<td><strong>Median Household Income:</strong></td>
<td></td>
</tr>
<tr>
<td>1999 (Census 2000)</td>
<td>$46,975</td>
</tr>
<tr>
<td>2010-2014 (ACS Estimate)</td>
<td>$62,286</td>
</tr>
<tr>
<td><strong>Households by Income Category, 2010-2014:</strong></td>
<td></td>
</tr>
<tr>
<td>Less than $24,999</td>
<td>17,658</td>
</tr>
<tr>
<td>$25,000 to $44,999</td>
<td>21,560</td>
</tr>
<tr>
<td>$50,000 to $74,999</td>
<td>21,364</td>
</tr>
<tr>
<td>$75,000 to $99,999</td>
<td>16,247</td>
</tr>
<tr>
<td>$100,000 or more</td>
<td>24,701</td>
</tr>
<tr>
<td><strong>Subdivision Activity, 2015:</strong></td>
<td># Appl.</td>
</tr>
<tr>
<td>Avg. Ann. New Unit Permits 2000-10</td>
<td>2,069</td>
</tr>
<tr>
<td>Avg. Ann. New Unit Permits 2011-14</td>
<td>1,212</td>
</tr>
<tr>
<td>Total New Unit Permits 2015</td>
<td>1,290</td>
</tr>
<tr>
<td>Short Plat</td>
<td>15</td>
</tr>
<tr>
<td>Long Plat</td>
<td>14</td>
</tr>
<tr>
<td>Large Lot</td>
<td>2</td>
</tr>
</tbody>
</table>

Salish Indian groups from the tribes now known as Nisqually, Squaxin, and Chehalis gathered shellfish and frequented the inlets and prairies of Puget Sound for centuries before Euro-American exploration and settlement.

The arrival of the early settlers established an American foothold in the area. By 1846, the settlers helped determine that the area would be part of the American Oregon Territory, rather than British (now Canadian) land.

Thurston County, originally to be called Simmons County, was named for Samuel Thurston when it was founded in 1852. By the end of 1853, the area north of the Columbia divided from Oregon and became its own territory – the Washington Territory. Thurston County was the most populous community in the new Washington in 1853 and continued to be so until the mid-1870s, when the Northern Pacific Railroad by-passed Olympia and made Tacoma its terminus on Puget Sound.

Explanation: 1Estimates based on survey data and may have a large margin of error. 2Numbers may not add due to rounding. 3Source: TRPC, Profile 2016 (www.trpc.org).
Thurston County Plan Development Process

Hazard Mitigation Plan Development Staff

Thurston County Emergency Services – Emergency Management Division led the development of the county’s update to its hazard mitigation strategy and plan process. The following individuals served as key staff throughout the planning process:

<table>
<thead>
<tr>
<th>Department/Title</th>
<th>Representative(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emergency Management, Program Manager</td>
<td>Sandy Eccker</td>
</tr>
<tr>
<td>Emergency Management, Emergency Management Coordinator</td>
<td>Andrew Kinney</td>
</tr>
</tbody>
</table>

Additional staff played a key role in providing technical and staff support throughout the plan process. These functions included reviewing and updating the region’s risk assessment, providing information on flood hazards, documenting the county’s participation in the National Flood Insurance Program, and assisting with public outreach. The following staff provided key support functions throughout the planning process:

<table>
<thead>
<tr>
<th>Department/Title</th>
<th>Representative(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resource Stewardship Department, Senior Plans Examiner and Floodplain Manager</td>
<td>Tim Rubert</td>
</tr>
<tr>
<td>Resource Stewardship Department – Water Resources Department, Water Resource Specialist III</td>
<td>Mark Biever</td>
</tr>
<tr>
<td>Public Works Department, Environmental Coordinator</td>
<td>Jeanne Kinney</td>
</tr>
<tr>
<td>Emergency Management, Emergency Management Coordinator</td>
<td>Vivian Eason</td>
</tr>
</tbody>
</table>

Hazard Mitigation Plan Development

To develop the Hazards Mitigation Plan Annex for Thurston County a Hazard Mitigation Plan Development Team (HMPDT) was formed of staff from departments and programs involved in mitigation work within Thurston County. The HMPDT consisted of the following staff:

<table>
<thead>
<tr>
<th>Representative</th>
<th>Department/Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pat Allen</td>
<td>Resource Stewardship Department, Senior Civil Engineer</td>
</tr>
<tr>
<td>Jim Bachmeier</td>
<td>Resource Stewardship Department, Water Resources Program Manager</td>
</tr>
<tr>
<td>Mark Biever</td>
<td>Resource Stewardship Department, Water Resource Specialist III</td>
</tr>
<tr>
<td>Mike Clark</td>
<td>Public Works Department, Assistant Design Engineer</td>
</tr>
<tr>
<td>Vivian Eason</td>
<td>Emergency Services Department, Emergency Management Coordinator</td>
</tr>
<tr>
<td>Sandy Eccker</td>
<td>Emergency Services Department, Emergency Management Manager</td>
</tr>
<tr>
<td>David Icenhower</td>
<td>Public Works Department, County Survey (former)</td>
</tr>
<tr>
<td>Jeanne Kinney</td>
<td>Public Works Department, Public Works Environmental Coordinator</td>
</tr>
<tr>
<td>Andrew Kinney</td>
<td>Emergency Services Department, Emergency Management Coordinator</td>
</tr>
</tbody>
</table>
Annex: Thurston County

Sonya Kroese  Emergency Services Department, Education and Outreach Program Assistant
Ryan Langan  Resource Stewardship Department, Storm and Surface Water Operations Manager
Scott Lindblom  Public Works Department, Public Works Director, Interim
Lucy Mills  Public Works Department, Road Operations Manager
Brad Murphy  Resource Stewardship Department, Senior Planner
Tim Rubert  Resource Stewardship Department, Plans Examiner/Floodplain Manager
James Yates  Emergency Services Department, Emergency Management Coordinator

The following activities supported the development of the county’s local hazard mitigation planning process:

<table>
<thead>
<tr>
<th>Date</th>
<th>Location</th>
<th>Activity</th>
<th>Subject</th>
</tr>
</thead>
<tbody>
<tr>
<td>02/17/2015</td>
<td>Thurston County Emergency Operation Center (TCEOC)</td>
<td>Meeting led by Sandy Eccker, Andrew Kinney and Paul Brewster, Associate Planner, TRPC attended by the HMPDT</td>
<td>Strategy for mitigation plan development</td>
</tr>
<tr>
<td>03/04/2015</td>
<td>TCEOC</td>
<td>Meeting led by Andrew Kinney and attended by HMPDT</td>
<td>Hazard assessment review, start on mitigation initiatives</td>
</tr>
<tr>
<td>06/03/2015</td>
<td>TCEOC</td>
<td>Meeting led by Andrew Kinney and attended by HMPDT</td>
<td>Discussed and developed new mitigation initiatives</td>
</tr>
<tr>
<td>09/15/2015</td>
<td>Email</td>
<td>Email to HMPDT</td>
<td>Email updates and review of mitigation initiatives</td>
</tr>
<tr>
<td>11/15/2015</td>
<td>Email</td>
<td>Email to HMPDT</td>
<td>Thurston County goals and Objectives</td>
</tr>
<tr>
<td>01/12/2016</td>
<td>TCEOC</td>
<td>Meeting led by Andrew Kinney and attended by HMPDT</td>
<td>Finalized Thurston County goals and objectives and discussed mitigation initiatives</td>
</tr>
<tr>
<td>06/22/2017</td>
<td>Email</td>
<td>Email to HMPDT</td>
<td>Finalized mitigation initiatives</td>
</tr>
<tr>
<td>08/16/2016</td>
<td>Email</td>
<td>Email to HMPDT</td>
<td>Prioritized migration initiatives to HIGH-MEDIUM-LOW</td>
</tr>
<tr>
<td>09/14/2016</td>
<td>TCEOC</td>
<td>Meeting led by Andrew Kinney and attended by Tim Rubert, Jeanne Kinney and Mark Beiver</td>
<td>Prioritized mitigation initiatives in their current numerical rank.</td>
</tr>
<tr>
<td>12/14/2016</td>
<td>TCEOC</td>
<td>Public Open House</td>
<td>Thurston County Draft Mitigation Initiatives shared with meeting attendees.</td>
</tr>
</tbody>
</table>
Mitigation Initiative Prioritization Process

The prioritization process initially ranked the county initiatives into a preliminary “high,” “medium,” and “low” rating. The plan development team then selected a subgroup of staff representing Water Resources, the county’s Permit Assistance Center, Emergency Management, and Public Works to determine the final ranking. Each member of the subgroup independently ranked the initiatives in the three groupings. The subgroup then discussed the benefits and the significance of each initiative related to Thurston County’s goals and objectives and the benefit cost review criteria presented in Chapter 2 of the core plan: life safety, property protection, technical, political, legal, environmental, social, administrative, local champion, and other community objectives. After two iterations of ranking, the subgroup reached consensus for the preferred ranking of the 29 initiatives shown in this annex.

The order of implementation may vary from the identified priority due to changing hazard conditions or the criteria of available county and grant funding. The county will pursue funding for projects that stand the greatest chance of competing for limited state and federal mitigation grant programs.

Plan Implementation and Integration:

Thurston County recognizes that sustainability, resiliency, and mitigation all help facilitate community recovery. To that end, Thurston County has integrated the concepts and data developed for the Hazards Mitigation Plan for the Thurston Region directly or indirectly into many county plans and programs including: Sustainable Thurston and the Thurston Climate Adaptation Plan (see pages 3.01-20 to 22. The county is also developing a strategy for community resiliency through its Thurston Thrives! initiative (http://www.co.thurston.wa.us/health/thrives/).

The county is currently updating its Flood Hazards Mitigation Plan in support of maintaining its participation in the Community Rating System. This plan update will draw extensively from the Hazards Mitigation Plan including hazard data, mitigation goals, objectives, and initiatives. Thurston County periodically assesses and updates its Comprehensive Plan. For a more detailed example and explanation of how mitigation is integrated into the Thurston County Comprehensive Plan. In fact, in 2013, FEMA Region X cited Thurston County as an example community for integration of Hazards Mitigation Planning into Comprehensive Plans.

The “Thurston County Annex to the Hazard Mitigation Plan for the Thurston Region” has mitigation initiatives derived from Thurston County Stormwater Manual, the Public Works Six Year Project Plan, and from basin plans. The County also partnered with Washington State Emergency Management Division (WA EMD), WA Department of Natural Resources (DNR), and the Office of Superintendent of Public Instruction to conduct seismic assessments of 20 K-12 schools in the county to develop a better understanding of building codes for schools and seismic vulnerability.

In addition to this work, Thurston County is working with FEMA on a RISK MAP project. As part of this project FEMA will be meeting with elected officials, department heads and county staff to identify and help define additional ways to integrate data, goals, objectives and initiatives that were developed in the mitigation plan process into county plans, procedures, and programs.
Thurston County Risk Assessment

Introduction

Chapters 4.0 through 4.6 of the core plan address the Disaster Mitigation Act risk assessment planning requirements. The Risk Assessment summarizes the hazards and the risks that pose the greatest threat to Thurston County. The Risk Assessment includes hazard profiles that describe the hazards, their causes, sources, severity, effects and impacts, probability of occurrence, historical occurrences, geographic extent or delineation, and the portion of the population, assets, and essential facilities potentially exposed to the hazard. The information is presented for general audiences and includes figures, maps, and tables.

Hazards Impact on Community:

Thurston County’s population has increased from 207,355 in 2000 to 272,700 in 2016, averaging approximately two percent per year. Additionally, Thurston County is experiencing more commuter and visitor traffic. This includes more people commuting to work, shopping, and recreating in Thurston County and also just passing through the county to work, shop, and recreate in surrounding areas of Pierce, Lewis, Mason and Grays Harbor counties. Thurston County is at the crossroads from Portland to Seattle and from the Cascades to the Coast. Therefore, despite all the positive actions Thurston County has taken to reduce and minimize the risk and exposure to hazards the population exposed to hazards and any given time is greater.

The County has regulations related to natural hazards in our Comprehensive Plan and Code of Ordinances which includes: Title 14 Building and Construction; Title 17 Environment; Title 19 Shoreline Master Program: Title 20 Zoning; and Title 24 Critical Areas.

Generally, these rules prohibit development in the FEMA floodway and severely limit development in the FEMA Floodplain (limited infrastructure). Thurston County is also in the process of mapping frequently flooded areas that are not recognized by FEMA that could, if allowed to develop, would experience impacts and damage to property as well as present a risk to life safety and welfare. Additional negative impacts to floodplain function would also likely occur.

Since 2009, Thurston County has assertively pursued opportunities to reduce its vulnerabilities to hazards. The county has provided direct assistance to homeowners to elevate 38 single family homes with a combination of federal Hazard Mitigation Grant Programs, Housing and Urban Development block grants, and Chehalis River Basin Flood Authority funds. In 2013 and 2016, the county removed two properties, one each year, at risk of river bank erosion with Department of Ecology Flood Control Assistance Account Program grants. The county is presently awaiting funding to elevate six additional properties to reduce their flood risk.

Thurston County is also an active participant in the National Flood Insurance Program’s Community Rating System. In October 2016, Thurston County received sufficient credit for its flood management activities to receive a Class 2 rating. Only six communities in the United States of received a Class 2 or better rating.
Development in geologically hazardous areas (landslide and seismic) is also addressed. Development in these hazard areas requires additional geo-technical analysis by a qualified professional to certify that if a landslide or earthquake occurred structures would not be compromised, inhabitants would remain safe and abutting property owners would not incur damage from failed structures. These rules don’t necessarily limit where development can occur but rather, the form that it takes in order to be safe.

Thurston County is also working on a Thurston Climate Adaption Plan and is working with Federal Emergency Management Agency (FEMA) on a RISK MAP project. This RISK MAP project looks at sea-level rise along the marine coastal area of Thurston County and will help direct our shoreline management program.

Hazard Analysis Definitions

The *Hazards Mitigation Plan for the Thurston Region* uses a subjective risk measurement process based on Thurston County’s Hazard Inventory and Vulnerability Assessment or HIVA. This methodology rates elements of each hazard’s risk characteristics using the descriptors high, moderate, and low. These descriptors are applied to the hazards’ probability of occurrence, vulnerability, and overall risk. The following is an overview of this risk measurement model:

**Risk Rating:** A description (high, moderate, or low) of the subjective estimate of the combination of any given hazard’s probability of occurrence and the region’s vulnerability to the hazard.

- High – There is strong potential for a disaster of major proportions.
- Moderate – There is medium potential for a disaster of less than major proportions.
- Low – There is little potential for a disaster.

**Probability of Occurrence:** A description (high, moderate, or low) of the probability of a hazard impacting Thurston County within the next 25 years.

- High – There is great likelihood that a hazardous event will occur within the next 25 years.
- Moderate – There is medium likelihood that a hazardous event will occur within the next 25 years.
- Low – There is little likelihood that a hazardous event will occur within the next 25 years.

**Vulnerability:** A description (high, moderate, or low) of the potential impact a hazard could have on Thurston County. Vulnerability can be expressed as combination of the severity of a hazard’s effect and its consequential impacts to the community. It considers the population, property, commerce, infrastructure, and services at risk relative to the entire county.

- High – The total population, property,
commerce, infrastructure, and services of the county are uniformly exposed to the effects of a hazard of potentially great magnitude. In a worst-case scenario, there could be a disaster of major to catastrophic proportions.

- Moderate – The total population, property, commerce, infrastructure, and services of the county are exposed to the effects of a hazard of moderate influence; or the total population, property, commerce, infrastructure, and services of the county are exposed to the effects of a hazard of moderate influence, but not all to the same degree; or an important segment of population, property, commerce, infrastructure and services of the county are exposed to the effects of a hazard. In a worst-case scenario, a disaster could be moderate to major, but not catastrophic, proportions.

- Low – A limited area or segment of population, property, commerce, infrastructure, or service is exposed to the effects of a hazard. In a worst-case scenario, there could be a disaster of minor to moderate proportions.

Hazard Profiles

The core plan includes detailed profiles of hazards that pose the greatest risk to the Thurston County. Because the core plan treats the entire county as the planning area, the core plan’s risk assessment is the definitive risk assessment for Thurston County. Each hazard profile fulfills all the following criteria:

1. There is a high probability of the natural hazard occurring in Thurston County within the next 25 years
2. There is the potential for significant damage to buildings and infrastructure; and/or
3. There is the potential for loss of life.

The following hazards meet one or more of the above criteria. Every hazard profile was evaluated and updated during the plan update process.

**Summary Assessment of Thurston County’s Risks**

<table>
<thead>
<tr>
<th>Hazard</th>
<th>Probability of Occurrence</th>
<th>Vulnerability</th>
<th>Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Earthquake</td>
<td>High</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>Storm</td>
<td>High</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>Flood</td>
<td>High</td>
<td>Moderate</td>
<td>High</td>
</tr>
<tr>
<td>Landslide</td>
<td>High</td>
<td>Low</td>
<td>Moderate</td>
</tr>
<tr>
<td>Wildland Fire</td>
<td>High</td>
<td>Moderate</td>
<td>Moderate</td>
</tr>
<tr>
<td>Volcanic Events</td>
<td>Low</td>
<td>High</td>
<td>Moderate</td>
</tr>
</tbody>
</table>
Mitigation Initiatives – Adopted

The adopted mitigation initiatives are Thurston County’s specific actions for mitigating losses and protecting life and property. They consist of initiatives that carried over from the previous plan and new initiatives that were identified during the plan update process. All the county’s adopted initiatives were reviewed and updated by the development team.

<table>
<thead>
<tr>
<th>Priority</th>
<th>2009 Rank</th>
<th>ID Number</th>
<th>Category</th>
<th>Initiative</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 of 29</td>
<td>n/a</td>
<td>TC-EH 3</td>
<td>Critical Facilities - Provide training to Design and Construction Engineers on conducting seismic evaluation and inspection of bridges.</td>
<td></td>
</tr>
<tr>
<td>2 of 29</td>
<td>5</td>
<td>TC-FH 22</td>
<td>Hazard Damage Reduction</td>
<td>Draft a prioritized list of road segments and bridges that should be elevated above the 100-year floodplain and culverts that will fail under flood flow. Upgrade these structures if state or federal monies become available.</td>
</tr>
<tr>
<td>3 of 29</td>
<td>25</td>
<td>TC-FH 10</td>
<td>Development Regulations</td>
<td>Reevaluate land uses and zoning based upon new floodplain maps.</td>
</tr>
<tr>
<td>4 of 29</td>
<td>28</td>
<td>TC-FH 14</td>
<td>Data Collection and Mapping</td>
<td>Prepare new drainage basin plans in priority areas such as Salmon and Yelm Creeks.</td>
</tr>
<tr>
<td>5 of 29</td>
<td>4</td>
<td>TC-FH 25</td>
<td>Hazard Damage Reduction</td>
<td>Develop evacuation plans for communities and residents situated downstream from the Nisqually and Skookumchuck river dams.</td>
</tr>
<tr>
<td>6 of 29</td>
<td>18</td>
<td>TC-FH 8</td>
<td>Data Collection and Mapping</td>
<td>Map the channel migration zones for all rivers in the region and the extent of high quality riparian habitat.</td>
</tr>
<tr>
<td>7 of 29</td>
<td>20</td>
<td>TC-FH 16</td>
<td>Hazard Damage Reduction</td>
<td>Draft a prioritized list of which residences the county would help relocate out or elevate above the 100-year floodplain, if state or federal monies are available.</td>
</tr>
<tr>
<td>8 of 29</td>
<td>10</td>
<td>TC-FH 15</td>
<td>Hazard Damage Reduction</td>
<td>Draft a prioritized list of which floodway residences the county would relocate out or acquire (buyout) if state and federal monies are available.</td>
</tr>
<tr>
<td>9 of 29</td>
<td>8</td>
<td>TC-FH 7</td>
<td>Data Collection and Mapping</td>
<td>Remap the floodplains for all rivers, streams, and high groundwater areas and update the Flood Insurance Rate Maps (FIRMs).</td>
</tr>
<tr>
<td>10 of 29</td>
<td>24</td>
<td>TC-FH 20</td>
<td>Plan Coordination and Implementation</td>
<td>Implement the recommendations of the adopted stormwater drainage basin plans.</td>
</tr>
<tr>
<td>11 of 29</td>
<td>29</td>
<td>TC-FH 17</td>
<td>Hazard Damage Reduction</td>
<td>Work with landowners and others to establish reforested corridors along river and stream shorelines.</td>
</tr>
<tr>
<td>12 of 29</td>
<td>30</td>
<td>TC-FH 18</td>
<td>Hazard Damage Reduction</td>
<td>Encourage research into bioengineering and other techniques which provide streambank protection and improve fisheries using large woody debris. Support local demonstration projects which could provide such research.</td>
</tr>
<tr>
<td>Page</td>
<td>Task ID</td>
<td>Category</td>
<td>Task Description</td>
<td></td>
</tr>
<tr>
<td>------</td>
<td>---------</td>
<td>----------</td>
<td>------------------</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>TC-FH 1</td>
<td>Plan Coordination and Implementation</td>
<td>Continue Thurston County’s enrollment in the Community Rating System (CRS) program as a part of the National Flood Insurance Program.</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>TC_LH 2</td>
<td>Hazard Damage Reduction</td>
<td>Prepare a landslide vulnerability index for county roads.</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>TC-FH 11</td>
<td>Development Regulations</td>
<td>Revise shoreline regulations to encourage “shoreline protective structures” to be “bioengineered.”</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>TC-EH 4</td>
<td>Hazard Preparedness</td>
<td>Provide Education on the Assessment and Reduction of Non-Structural Earthquake Hazards.</td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>TC-MH 2</td>
<td>Hazard Preparedness</td>
<td>Coordinate existing plans for post disaster inspections of critical facilities and other publicly owned buildings.</td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>TC-LH 1</td>
<td>Development Regulations</td>
<td>Limit activities in identified potential and historical landslide areas through regulation and public outreach.</td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>TC-MH 1</td>
<td>Hazard Preparedness</td>
<td>Build a redundant network infrastructure at Tilley Road campus as an alternate site when a disaster hit and the Thurston County main courthouse campus data center becomes inoperable and unavailable.</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>TC-FH 21</td>
<td>Hazard Damage Reduction</td>
<td>Study repetitive public cost losses, this would include residential structures, but also include properties such as livestock, out-buildings and rescue costs not already identified by FEMA.</td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>TC-MH 8</td>
<td>Data Collection and Mapping</td>
<td>Conduct a Study to Assess County Private Sector Ability to meet public demand for critical resources in the Event of Supply Chain Disruption.</td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>TC-FH 12</td>
<td>Development Regulations</td>
<td>Work with others to determine the width and conditions of buffers along river and stream shorelines.</td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>TC-FH 4</td>
<td>Plan Coordination and Implementation</td>
<td>Continue to be actively involved in the multiple jurisdiction flood hazard reduction efforts within the Chehalis River Basin Flood Authority.</td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>TC-FH 9</td>
<td>Data Collection and Mapping</td>
<td>Develop mapping protocols to archive all flood maps and data sets so they can be reused later.</td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>TC-MH 7</td>
<td>Hazard Preparedness</td>
<td>Develop plans to address the medical needs of people who rely on electrically powered medical equipment and/or do not have dependable transportation.</td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>TC-MH 3</td>
<td>Hazard Preparedness</td>
<td>Improve the capability to identify moderate to long term road impedances, and put them into the CAD (Computer Aided Dispatch).</td>
<td></td>
</tr>
<tr>
<td>27</td>
<td>TC-FH 13</td>
<td>Development Regulations</td>
<td>Draft a Comprehensive Plan policy which encourages the creation and use of wetland mitigation bank.</td>
<td></td>
</tr>
<tr>
<td>28 of 29</td>
<td>19</td>
<td>TC-MH 6</td>
<td>Hazard Preparedness</td>
<td>Conduct a study of private roads and bridges to determine their capacity to provide access to emergency vehicles.</td>
</tr>
<tr>
<td>29 of 29</td>
<td>21</td>
<td>TC-FH 2</td>
<td>Plan Coordination and Implementation</td>
<td>Secure funding for flood related projects within the 20-year Stormwater Capital Facilities Plan.</td>
</tr>
</tbody>
</table>
Hazard Addressed: Earthquake Hazard
Category: Critical Facilities – Bridges in Unincorporated Thurston County seismic evaluation and inspection.

TC-EH 3: Provide training to Design and Construction Engineers within Thurston County Public Works on conducting seismic evaluations of bridges in the unincorporated areas of Thurston County.

Rationale: Bridges play a critical role in the transportation network within Thurston County. Rapid evaluation of bridge integrity is important to facilitate community recovery after an earthquake. Currently Thurston County Public Works maintains a sufficiency rating based on structural and geometric adequacy and other factors, but this does not effectively include any seismic evaluations. Public Works would like to provide the seismic evaluation training to engineering staff to facilitate bridge inspections after earthquakes.

In addition to this training the Federal Emergency Management Agency (FEMA) Region 10 office is conduction HUZAS model evaluations for both floods and earthquakes for the bridges in Thurston County. This analysis will help direct county staff to critical bridges for inspections in the event of floods and earthquakes.

Relates to Plan Goal(s) and Objectives: 1D, 2A

Implemeneter: Thurston County Public Works

Estimated Cost: $10,000

Time Period: 2016 - 2018

Funding Source: Grants and annual budgets

Source and Date:

Adopted Plan Number:

Reference Page:

Initiative and Implementation Status: Thurston County Public Works has completed the “Emergency Response Plan for Post-Earthquake Disaster Evaluation of Bridges and Roads”, but need the additional seismic evaluation training.
Priority: 2 of 29

Hazard Addressed: Flood Hazard
Category: Hazard Damage Reduction

TC-FH 22: Draft a prioritized list of road segments and bridges that should be elevated above the 100-year floodplain and culverts that will fail under flood flow. Upgrade these structures if state or federal monies become available.

Rationale: Thurston County has actively pursued grants and programs to elevate residential structures, this initiative would actively pursue public infrastructure elevation. Criteria will be developed to rank potential road segments and bridges for elevation opportunities and culverts that may fail during flooding, for replacement. This will assist the county in being more proactive to flood management, not reactive.

Relates to Plan Goal(s) and Objectives: 2A, 5C

Implementer: Thurston County Public Works, Thurston County Resource Stewardship, and Thurston County Central Services – Thurston GeoData Center

Estimated Cost: $25,000

Time Period: 2016 – 2021

Funding Source: Unknown

Source and Date: Natural Hazards Mitigation Plan for the Thurston Region, Thurston County Annex Sept. 2009

Plan Number: TC-FH 22

Page: Thurston County - 22

Initiative and Implementation Status: Culvert inventory has been completed. FEMA is conducting a RISKMap analysis for Thurston County that will model flood water distribution and depth. This analysis will assist in determining critical road segments and bridges. Thurston County Resource Stewardship is working on modeling urban flood potentials and identifying undersized culverts. Work is continuing identifying road segments and bridges that will be impacted by floods and/or landslides.
Priority: 3 of 29

Hazard Addressed: Flood Hazard
Category: Development Regulations

TC-FH 10: Reevaluate land uses and zoning based upon new floodplain maps.

Rationale: After preparing the new floodplain maps, the very next step will be to incorporate this new data into the development permit review process. It is likely to assume that the areas covered under these maps will increase, and that those new coverages (data sets) will extend into already built up areas or developing areas. Therefore, the adoption process for each new floodplain map will need to include a detailed analysis of impacts and options not unlike a sub-area plan. These reviews would be phased to coincide with the river system being mapped.

Relates to Plan Goal(s) and Objectives: 8A, 8B

Implementer: Thurston County Resource Stewardship

Estimated Cost: $5,500

Time Period: 2016 – 2021

Funding Source: Program annual budget

Source and Date: Thurston County Flood Hazard Management Plan (Revised 12/2012)

Adopted Plan Number: MR-6

Reference Page: VIII-11

Initiative and Implementation Status: All 100 year floodplains for Thurston County have not yet been re-mapped (see TC-FH 7). Under the FEMA RISKMAP program the Deschutes River floodplains have been remodeled and remapped and included in the Comprehensive Plan update in 2016. The Marine Coastal floodplains and Lower Chehalis River, including the Skookumchuck and lower Black Rivers and Scatter Creek, are underway in the RISKMAP program and the Nisqually River is planned to start in 2017. All floodplain revisions will be included in the Comprehensive Plan as updated.
**TC-FH 14:** Prepare new drainage basin plans in priority areas such as Salmon and Yelm Creeks.

**Rationale:** Drainage basin plans have been prepared for six watersheds within northern Thurston County. These plans have been the basis for recommended solutions for flooding, habitat, and water quality projects. These needs have been incorporated into a list of capital facility projects. It is also not possible to generate this sort of targeted list on a countywide level. The plans can also identify other aspects of land use or zoning that may require further integration or analysis.

**Relates to Plan Goal(s) and Objectives:** 4C, 8A, 8B

**Implementer:** Thurston County Storm and Surface Water Utility

**Estimated Cost:** $200,000 - $400,000

**Time Period:** 2010 - 2015

**Funding Source:** Unknown

**Source and Date:** Thurston County Flood Hazard Management Plan (1999)

**Adopted Plan Number:** MR-12

**Reference Page:** VIII-14

**Initiative and Implementation Status:** The City of Yelm began its Yelm Creek Comprehensive Flood Hazard Management Plan process in 1999 and adopted the plan in August 2001 via Resolution # 1234. Thurston County is presently working on the Yelm Basin Plan. Thurston County began working on Salmon Creek basin plan in 1999. The Salmon Creek Comprehensive Drainage Basin Plan was completed in June 2004 and was approved by Thurston County and the City of Tumwater.
**Annex: Thurston County**

**Priority:** 5 of 29

**Status:** Existing - In Progress

**Hazard Addressed:** Flood Hazard  
**Category:** Hazard Damage Reduction

**TC-FH 25:** Develop evacuation plans for communities and residents situated downstream from the Nisqually and Skookumchuck River dams.

**Rationale:** In the event of a large release from the Nisqually or Skookumchuck River dams, downstream residents and communities must be moved out of harm’s way as effectively and quickly as possible. This initiative will establish procedures for warning, evacuating, and sheltering those within the dam inundation areas. It will also identify procedures for securing the perimeter and the interior of the affected area and for allowing evacuees to return to their homes. The procedures will be designed to accomplish these functions with minimum confusion and maximum speed.

**Relates to Plan Goal(s) and Objectives:** 1B, 7B, 8B

**Implementer:** Thurston County Emergency Services, Resource Stewardship

**Estimated Cost:** $50,000

**Time Period:** 2016-2018

**Funding Source:** Grants and Local Match

**Source and Date:** Natural Hazards Mitigation Plan for the Thurston Region, Thurston County Annex Sept. 2009

**Adopted Plan Number:** TC-FH 25

**Reference Page:** Thurston County -22

**Initiative and Implementation Status:** This is a non-funded; accomplish as can project. Preliminary meetings held with JBLM, Nisqually Tribe, City of Yelm and Pierce County Emergency Management. With the completion of Initiative TC MH4 “Alert/Notification System the necessity of evacuation routes has been reduced because of the increase in the ability of alerting the public to potential hazardous conditions. Evacuation routes are still being developed and will be marked accordingly.
Annex: Thurston County

Priority: 6 of 29

Status: Existing – In Progress

**Hazard Addressed:** Flood Hazard

**Category:** Data Collection and Mapping

**TC-FH 8:** Map the channel migration zones for all rivers in the region and the extent of high quality riparian habitat.

**Rationale:** Mapping of valuable or important natural features is just as an important role for a GIS system as mapping hazardous areas. Areas with excellent riparian habitat have very low impact upon the river during flood events. Given these conditions, the importance of identifying these existing high quality habitats will establish baseline conditions from which future restoration projects (e.g. TC-FH 17) can build upon. The historic meander belt has been mapped for the Deschutes River. GIS mapping of similar channel migration zones will be needed for the Black, Chehalis, Skookumchuck, and Nisqually Rivers, with an update for the Deschutes River using the same methodology.

**Relates to Plan Goal(s) and Objectives:** 3A, 4B, 4C, 7B, 8A

**Implementer:** Thurston County Resource Stewardship, Thurston County Stormwater Utility, and Thurston County Central Services – Thurston GeoData Center

**Estimated Cost:** $930,000

**Time Period:** 2017-2022

**Funding Source:** Some grants, some still unknown

**Source and Date:** Thurston County Flood Hazard Management Plan Dec. 2012

**Adopted Plan Number:** FMI – 23

**Reference Page:** 9 - 7

**Initiative and Implementation Status:** Thurston County has used its 2-foot contour maps to create GIS topographic shape maps which indicated where the channel migrations zones have been since the end of the last period of glaciation. Note, there is disagreement on the appropriate methodologies for mapping the 100-year channel migrations. It will be important to do this mapping with a comprehensive understanding of the 100-year flow estimates, erodible soils, hardened shorelines, forested corridors, and the fluvial dynamics of lowland river systems. The mapping of high quality riparian habitat is an activity which began in the late 1990’s and will continue for an indefinite period. A “Limiting Factors Report” has been prepared for each of the drainage basins. Each of the WRIA (watershed) planning projects is collecting information within its WRIA boundary, so it will be important to merge that data together into a common layer for the entire Thurston region. Thurston County Stormwater Utility has initiated a program to characterize the basins within the county. This will aid in the development of basin plans, the update of the Critical Area Ordinance, and the county’s Comprehensive Plan.
Priority: 7 of 29

Status: Existing

Hazard Addressed: Flood Hazard

Category: Hazard Damage Reduction

TC-FH 16: Draft a prioritized list of which residences the county would help relocate out or elevate above the 100-year floodplain, if state or federal monies are available.

Rationale: There were approximately 120 residences along the Nisqually River which were damaged to the degree that their structural integrity was evaluated after the floods of 1995/1996. Of these, approximately 50-60 homes continue to be habitable structures which could greatly benefit from having their first-floor level elevated. In 1998 the Thurston County Housing Authority obtained a State Community Development Block Grant to elevate 4 residences in unincorporated Thurston County. Although costs for elevation generally average about $40,000 per structure, this is much less per structure than a buy-out program. Thus, a greater number of structures could be flood proofed and an established neighborhood maintained, in comparison with an equally funded buy-out program. In the future, criteria will need to be developed to rank potential residence elevation opportunities before and not after the next full-scale flooding event. An elevation program is most appropriate for residences within the floodplain away from high velocity flows, or in areas of high groundwater.

Relates to Plan Goal(s) and Objectives: 3A,

Implementer: Thurston County Resource Stewardship, Thurston County Central Services – Thurston GeoData Center

Estimated Cost: $20,000 (Note: To be done with TC-FH 15)

Time Period: 2010 - 2015

Funding Source: Unknown

Source and Date: Thurston County Flood Hazard Management Plan Dec. 2012

Adopted Plan Number: FMI -1

Reference Page: 9 - 4

Initiative and Implementation Status: The Thurston County Storm and Surface Water Utility created a partial list because of the disaster declaration for the February 2001 Nisqually earthquake. Their focus, which related to their work on the Salmon Creek Drainage Basin Study, was only for high ground water areas. They identified 100 properties which high groundwater maps and flood damage records indicated a possible benefit to elevating the structure. A total of 100 letters were sent out with a response rate of 20. Of these respondents, only 10 had a benefit to cost ratio of more than 1 to 1. Of these, no mitigation monies from the Nisqually earthquake were made available. However, two properties qualified for funds from the federal Community Development Block Grant which was awarded to Thurston County for the Nisqually River flooding of 1996. In the end, one structure was elevated. This initiative is to be done with TC-FH 15 and after the remapping of all the flood plains (TC-FH 7). Priorities will most likely be based on the depth of flooding for the habitable structures. In 2008 Thurston County obtained a State Community Development Block Grant to elevate up to 35 residences in the Chehalis River basin unincorporated area of Thurston County. Although costs for elevation generally average
about $26,000 per structure, this is much less per structure than a buy-out program. Thus, a greater number of structures could be flood proofed and an established neighborhood maintained, in comparison with an equally funded buy-out program. An elevation program is most appropriate for residences within the floodplain away from high velocity flows, or in areas of high groundwater flooding.

Thurston County continues to work on this initiative as time and resources permit. Most recently the County has developed a process with the Chehalis Flood Authority to identify structures that could be elevated. So far, using this process, the county has identified twelve (12) structures for elevation in the Chehalis River watershed and the county has provided the Flood Authority with this list to elevate for the 2017-2019 grant cycle. Additional analysis was completed on the Skookumchuck River and Scatter Creek preliminarily identifying an additional 224 to elevate. Additional analysis needs to be conducted on the potential to relocate any of these structures.
**Hazard Addressed:** Flood Hazard  
**Category:** Hazard Damage Reduction

**TC-FH 15:** Draft a prioritized list of which floodway residences the county would relocate out or acquire (buyout) if state and federal monies are available.

**Rationale:** The 1995/1996 floods along the Nisqually River caused the most significant damage in the county. Of the approximately 800 countywide residences damaged by the floods, approximately 120 along the Nisqually River were damaged to the degree that the home’s structural integrity was evaluated by Thurston County. Many of those located in the floodway were destroyed by the flood or were later abated by Thurston County. In 1998, the county obtained a State Community Development Block Grant to help make the lives of 23 former valley residents right again. However, the grant is not large enough to address all affected properties, let alone evaluating properties with similar potential along other rivers. In the future, criteria will need to be developed to rank potential buy-out properties before and not after the next large scale flooding event. A buyout program is most appropriate for residences within river floodways or areas at the highest risk of flooding.

**Relates to Plan Goal(s) and Objectives:** 3A

**Implementer:** Thurston County Resource Stewardship

**Estimated Cost:** $20,000 (Note: To be done with TC-FH 16)

**Time Period:** 2017 – 2022

**Funding Source:** Unknown – Currently this is unfunded, mitigation grants would be needed to complete this project

**Source and Date:** Thurston County Flood Hazard Management Plan Dec. 2012

**Adopted Plan Number:** FMI -1

**Reference Page:** 9 - 4

**Initiative and Implementation Status:** In 2003 Thurston GeoData Center developed a footprint map based upon the year 2000 aerial photos. They have now identified approximately 3,300 structures which lie within the mapped 100-year floodplain of unincorporated Thurston County. This does not include the mapped high ground water areas. Additional work will be required to screen out garages and agricultural buildings, and create a data layer of only habitable structures. Once this is complete, it will then be necessary to add a depth of flooding component (depth of water in the structure) to screen out the areas of nuisance flooding from those structures which may be severely impacted by the 100-year flood event. Thurston County has flown the county at three-inch pixel resolution in 2009 and will utilize this photography to update the building footprint inventory. The county has also completed mapping the extent of high water in the major river basins. Structures which are found to lie within the designated “floodway” and which have a depth of water greater than 3 feet and a water velocity of 3 cubic feet per second would be at the highest risk and will be prioritized for buyout. Thurston County continues to work on this initiative as time and resources permit. Most recently the county has developed a process with the Chehalis Flood Authority to identify structures that could be relocate or buy-out candidates. So far, using this process, the county has identified eight structures for buy-
out in the Chehalis River watershed and the county has provided the Flood Authority with this list to buy-out for the 2017-2019 grant cycle. Additional analysis was completed on the Skookumchuck River and Scatter Creek preliminarily identifying an additional 55 to buy-out. Additional analysis needs to be conducted on the potential to relocate any of these structures.
**Priority:** 9 of 29

**Status:** Existing – In Progress

**Hazard Addressed:** Flood Hazard

**Category:** Data Collection and Mapping

**TC-FH 7:** Remap the floodplains for all rivers, streams, and high groundwater areas and update the Flood Insurance Rate Maps (FIRMs).

**Rationale:** The floods of 1990 and 1996 have indicated the inadequacy of the 1982 FEMA 100-year floodplain maps. Although Thurston County amended its Flood Plain Ordinance to require consideration of aerial photos showing the extent of the “flood of record”, it and the Critical Area Ordinance rely upon an officially adopted map. Once the aerial topography project is complete, Thurston County should begin to develop new flood maps based upon new USGS protocol contained within “Updating Flood Inundation Maps Effectively”, as amended or updated. Remapping should be in the following order: Nisqually, Deschutes, Skookumchuck, Chehalis, and Black River.

**Relates to Plan Goal(s) and Objectives:** 7A, 7B,

**Implementer:** FEMA Region 10, WA Dept. of Ecology, Thurston County Central Services – Thurston GeoData Center.

**Estimated Cost:** Unknown

**Time Period:** 2017 - 2021

**Funding Source:** Unknown

**Source and Date:** Natural Hazard Mitigation Plan for the Thurston Region – Thurston County Annex, 2009

**Adopted Plan Number:** TC-FH 7

**Reference Page:** Thurston County - 25

**Initiative and Implementation Status:** Thurston County continues to work with WA DOE and FEMA Region 10 on FEMA’s RISKMAP program to remodel and remap floodplains in Thurston County. To date, the Deschutes River has been completed, final floodplain maps will be adopted in 2016. The Marine Coastal shoreline area has the preliminary maps completed. They are under review and comment and should also be adopted in 2016. The Lower Chehalis watershed which includes the Chehalis, Black, and Skookumchuck river and Scatter Creek is currently underway and is expected to be completed in late 2017/early 2018. The Nisqually River project is expected to start in 2018. Presently there are no FEMA plans for mapping high groundwater. Thurston County captures high water elevation during flooding events and manages development to the FEMS 100-year floodplain or the documented high water level plus two feet whichever is greater. Thurston County is also working on developing a map of the extent of high groundwater flooding.
TC-FH 20: Implement the recommendations of the adopted stormwater drainage basin plans.

Rationale: Thurston County has adopted five stormwater drainage basin plans. These cover areas in and around the north county urban growth area boundary. While another initiative has targeted the capital facilities plan items, each plan contains recommendations for other non-CFP activities. These may include adopting new development regulations, developing new capital facility projects, and developing new policies for the comprehensive land use plan. For example, the Green Cove Creek Drainage Basin Plan (2000) contained a recommendation for maintaining a certain percent of forest canopy. To implement this would involve changes to zoning densities, and other development regulations. It may also include the acquisition of conservation easements and reforestation of parcels to help attain the target for forest cover.

Relates to Plan Goal(s) and Objectives: 8B

Implementer: Thurston County Storm and Surface Water Utility

Estimated Cost: Cost is part of annual work plan.

Time Period: 2017 - 2021

Funding Source: Unknown (Combination of grants and annual budget)

Source and Date: Natural Hazards Mitigation Plan for the Thurston Region – Thurston County Annex 2009

Adopted Plan Number: TC-FH 20

Reference Page: Thurston County - 43

Initiative and Implementation Status: This work is ongoing as part of the Comprehensive Plan Update, The Shoreline Management Plan update, the Watershed Characterization Program, and current work in the Thurston County Storm and Surface Water Utility.
**Priority:** 11 of 29

**Status:** Existing

**Hazard Addressed:** Flood Hazard

**Category:** Hazard Damage Reduction

**TC-FH 17: Work with landowners and others to establish reforested corridors along river and stream shorelines**

**Rationale:** To reestablish a forested edge along river and stream shorelines countywide is a significant long-term project that will involve more just than Thurston County. It would require working with thousands of property owners and involve planting of countless trees and plants. Easement or use restrictions may be employed, since reliance on completely voluntary incentives, such as the Open Space Tax Program, have shown that other techniques will need to be employed if the State’s Salmon Strategy is to be a success.

**Relates to Plan Goal(s) and Objectives:** 4A, 4B, 6B,

**Implementer:** Thurston County Resource Stewardship, Thurston County Public Works, Thurston Conservation District, and U. S. Natural Resources Conservation Service

**Estimated Cost:** Unknown

**Time Period:** 2017 – 2024

**Funding Source:** Unknown

**Source and Date:** Thurston County Flood Hazard Management Plan (Revised 12/2012); Resolution #11947

**Adopted Plan Number:** FDR-3

**Reference Page:** VIII-16

**Initiative and Implementation Status:** Since 1999 Thurston County has been engaged with the watershed based salmon recovery projects sponsored by the Salmon Recovery Funding Board (SRFB). This accounted for 80 projects totally approximately $26.2 million (Nisqually WRIA, $17 million; Deschutes WRIA, $6.5 million; Kennedy-Goldsborough WRIA, $547,000; and Chehalis WRIAs, $2.1 million). It has been necessary to undertake some data collection efforts before on the ground activities. It is likely that riparian restoration activities will increase in the future as the restoration standards are better understood, and more property owners understand the financial and environmental benefits. In 2016 Thurston County provided support to the Nisqually Land Trust’s “Watershed By Design” grant application for restoration and enhancement projects on the middle and upper Nisqually River. These projects will help restore salmon habitat, reduce sedimentation rates, help slow channel migration, and reduce flooding impacts.
Priority: 12 of 29
Status: Existing

Hazard Addressed: Flood Hazard
Category: Hazard Damage Reduction

TC-FH 18: Encourage research into bioengineering and other techniques which provide streambank protection and improve fisheries using large woody debris. Support local demonstration projects which could provide such research.

Rationale: Local knowledge is often gained through local examples. The State has funded several bioengineering pilot projects on the Deschutes River. Not only did these projects solve existing problems, but they added to the local cumulative knowledge and were successful projects. If the State Salmon Strategy is to succeed, it will be necessary to continue to learn how to protect shorelines while providing as much fish habitat as possible.

Relates to Plan Goal(s) and Objectives: 4A, 4B

Implementer: Thurston County Resource Stewardship, Thurston County Public Works, Thurston Conservation District, and Natural Resources Conservation Service.

Estimated Cost: Unknown
Time Period: 2017 - 2022
Funding Source: Unknown

Source and Date: Thurston County Flood Hazard Management Plan, December, 2012
Adopted Plan Number: FMI - 3
Reference Page: 9 - 4

Initiative and Implementation Status: Thurston County has been sharing data with other governmental entities regarding engineered logs, due to the presence of a significant log jam on the Deschutes River near Offut Lake. Several engineered logjams were constructed throughout the Puget Sound region and are monitored for their performance. It is likely that preliminary results on the performance of these structures will not be complete until 2010 or later. In addition to this research, Thurston County has utilized large woody materials (LWM) on 6 other projects (see next page for details).

Thurston County Public Works uses the Integrated Streambank Protection Guidelines, 2002, which was a cooperative effort by WDFW, Ecology, Army Corps of Engineers, WSDOT, WDNR, and USFWS. We also use Stream Habitat Restoration Guidelines, 2004, by Ecology, USFWS and WDFW for design of riparian crossings and bank protection projects. Thurston County is also looking at including bioengineering in their Shoreline Management Plan update.

Independence Road Erosion Project CRP 61375. This project includes protecting approximately 140 feet of Independence Road from the eroding south bank of the Chehalis River by bioengineered bank stabilization, including placing large rock at the toe, topped with layers of geotextile lifts interspersed with layers of willow wattles. Above the rock, approximately 45 pieces of large wood, including large tree trunks with root wads attached will be anchored to provide fish habitat and recruit more wood and sediment to the site. Construction is taking place in 2009.
Independence Road North Project CRP 77095. The proposed project extends for 300 feet along the left bank of the Chehalis River. The project has four major elements that are intended to augment the existing bank stabilization and provide mitigation for the emergency placement of rock due to heavy rains and high water levels in the Chehalis that threatened Independence Road in December 2006. The elements include:

- Partial removal of existing riprap, which was placed on an emergency basis during December 2006 to prevent severe erosion that threatened the road;
- Sloping back of the slope between the river and Independence Road to increase stability and reduce adverse effects on the river by incorporating approximately 24 pieces of large wood, including poles and large tree trunks with root wads attached, into the bioengineered slope;
- Placement of a wood toe upstream of the existing riprap to reduce the potential for flanking around the structure; and
- Revegetation of the entire site with native riparian and upland species.

Houston St off of 17th NW. This site consisted of a degraded channel, perched culvert and slumping bank. We installed two medium size root wads with stems trenched back into the bank and modified the existing weirs to create pools and elevate the channel bed at the outlet.

Holiday Valley NW (Schneider Creek). The failure consisted of channel migration and failing bank upstream of a large diameter culvert. Crews installed 4 LWM at various elevations along the bank and some toe rock for protection and habitat. We replanted the bank and disturbed soils last year and this site is functioning very effectively.

Lackamas Creek SE on Bald Hills Road. The site consists of a new bridge and utilizes existing LWM onsite (two maple trees) to protect the northwest abutment. This LWM was placed upstream during construction and created some great habitat for various species. The site has experienced numerous high flow events and has successfully protected the structure.

Cedar Flats Road SW. The new bridge was installed after Swift Creek washed out the culvert during a major storm event. This past fall the crews noticed that channel started to shift towards the west and the potential of the bank and abutment failure was high. LWM was incorporated into the bank to push the channel back in its original location and protect the abutment.
Hazard Addressed: Flood Hazard
Category: Plan Coordination and Implementation

TC-FH 1: Continue Thurston County’s enrollment in the Community Rating System (CRS) program as a part of the National Flood Insurance Program.

Rationale: The Community Rating System (CRS) is a voluntary program within the National Flood Insurance Program. Thurston County enrolled in the CRS program in 2000. The county’s current rating is Class 5. At that time, this was one of the highest ratings in the entire nation for a county. This certification provides residents within unincorporated areas with a 25% reduction in their private flood insurance rates. This reduction will be very important to the residents of Thurston County when the flood plains are remapped. It is likely that the new flood boundaries will be for a larger area, and will mean that these new parcels must purchase flood insurance. In 2009 there were 663 flood insurance policies in unincorporated Thurston County providing coverage of $141.8 Million with annual premiums of $316,352. The CRS program provides the framework for flood hazard mitigation initiatives and other activities to reduce the county’s exposure to flooding. The CRS program requirements also exceed those for a natural hazard mitigation plan in the areas of habitat protection, relationship to threatened and endangered species, and in how the public/flood plain residents are engaged in the adoption process. Therefore, it will be desirable to merge the CRS provisions into this plan during the next update cycle.

Relates to Plan Goal(s) and Objectives: 8B

Implementer: Thurston County Resource Stewardship

Estimated Cost: $18,000

Time Period: 2017 - 2022

Funding Source: Program annual budget

Source and Date: Thurston County Flood Hazard Management Plan, December, 2012

Adopted Plan Number: FMI - 5

Reference Page: 9 - 4

Initiative and Implementation Status: The Community Rating System (CRS) is a voluntary program within the National Flood Insurance Program. Thurston County enrolled in the CRS program in 2000. Thurston County was reviewed in October 2015 and evaluated as a Class 4. Thurston County received FEMA’s official notification of their classification as a Class 2 CRS Community in November 2016. (See also Thurston County Participation in the National Flood Insurance Program).
Hazard Addressed: Landslide Hazard  
Category: Hazard Damage Reduction  

TC-LH 2: Prepare a landslide vulnerability index for county roads.

Rationale: Create a roadway hazard data layer relating to unstable slopes. Utilize the county’s list of problem roads and previous damage locations. Inspect, evaluate and rank each potential slope. Use a hazard classification system like WSDOT including the potential impact on health and safety, as well as commercial disruption. Also, use this list to prioritize repairs and identify first response plans for high risk sites.

Relates to Plan Goal(s) and Objectives: 7A, 7B, 7C

Implementer: Thurston County Public Works, Resource Stewardship and Thurston County Central Services Departments.

Estimated Cost: $25,000 (Thurston County acquired a new LIDAR dataset in 2011)

Time Period: 2017 - 2019

Funding Source: Grants

Source and Date: Natural Hazards Mitigation Plan for the Thurston Region (2003)

Adopted Plan Number: TC-LH 2

Reference Page: V-201

Initiative and Implementation Status: Thurston County has purchased the LIDAR dataset, an acquired Liquefaction and Land motion data and maps from the Washington State Department of Natural Resources (DNR) and Soil Classification updates from Natural Resources Conservation Service (NRCS) to utilize in this analysis. Thurston County is cooperatively working with DNR staff to conduct a landslide vulnerability assessment of the county. Additionally, Thurston County staff are assembling data on known land and mud slides within the county. FEMA is also conducting a Risk MAP assessment of Thurston County which will review landslide hazards.
Annex: Thurston County

**Priority:** 15 of 29

**Hazard Addressed:** Flood Hazard  
**Status:** Existing

**Category:** Development Regulations

**TC-FH 11: Revise shoreline regulations to encourage “shoreline protective structures” to be “bioengineered.”**

**Rationale:** The past decade has brought a fundamental transformation in how stream bank erosion projects are approached. The technique, called “bioengineering”, combines the fields of engineering, landscaping, hydro-geology and fisheries biology. It uses bits and pieces of these disciplines to mimic natural river conditions. This text change is necessary because several stream bank restoration projects constructed by federal agencies were approved under the guise of restoration projects but were constructed as rip-rap or rock only jobs.

**Relates to Plan Goal(s) and Objectives:** 4A, 4B, 8B

**Implemeneter:** Thurston County Resource Stewardship

**Estimated Cost:** $5,000

**Time Period:** 2010-2011

**Funding Source:** Annual budget for Shoreline Management Plan update

**Source and Date:** Thurston County Flood Hazard Management Plan (1999); Resolution #11947

**Adopted Plan Number:** MR-8

**Reference Page:** VIII-12

**Initiative and Implementation Status:** Thurston County is currently updating their Shoreline Management Plan (Feb. 2011) and their Critical Area Ordinance which includes bioengineering for shoreline protection. In initiative TC-FH-18 are examples of existing bioengineered projects within the county.
Hazard Addressed: Earthquake Hazard
Category: Hazard Preparedness

TC or CW-EH 4: Provide Education on the Assessment and Reduction of Non-Structural Earthquake Hazards.

Rationale: Damage from earthquakes can occur in nonstructural components such as:

- Architectural components (partitions, ceilings, storefronts, glazing, cladding, veneers, chimneys, fences, and architectural ornamentation)
- Mechanical, Electrical, and Plumbing components (pumps, chillers, fans, air handling units, motor control centers, distribution panels, transformers, and distributions systems such as piping ductwork and conduit)
- Furniture, Fixtures & Equipment, and Contents (shelving, book cases, industrial storage racks, retail merchandise, books, medical records, computers and desktop equipment, wall and ceiling mounted TVs and monitors, file cabinets, kitchen, machine shop or other specialty equipment, industrial chemicals or hazardous materials, museum artifacts, and collectibles).
- Damage to non-structural components of a building can cause injury or affect the operational use of buildings after an earthquake even though the structural component hazards have been mitigated.

This initiative will educate building owners, facility managers, maintenance personnel, store or office managers, corporate or agency department heads, and homeowners on sources of earthquake damage in nonstructural components and provide information on effective methods for reducing risk associated with nonstructural building damage.

Relates to Plan Goal(s) and Objectives: 6A, 6B, 9A

Implementer: Thurston County Emergency Management

Estimated Cost: $ 2500 per class offering (Producing materials, FTE hours for preparation & delivery)

Time Period: 2016-2021

Funding Source: Grants and Annual Budget

Source and Date:

Adopted Plan Number:

Reference Page:

Initiative and Implementation Status: New Initiative.
Hazard Addressed: Multi Hazard  
Category: Hazard Preparedness

TC-MH 2: Coordinate existing plans for post disaster inspections of critical facilities and other publicly owned buildings.

Rationale: This task will require coordination between four Thurston County departments. The building inspectors from Resource Stewardship and Central Services would be inspecting the structures, whereas the inspectors from Public Works would focus on bridges and the other pieces of the county’s transportation infrastructure. Emergency Services will coordinate these plans and personnel before a disaster so that all the critical facilities are inspected in a timely fashion and one of the county’s facilities is not overlooked in the process. Over time, the county would like to broaden this initiative to include all jurisdictions. Therefore, it may be appropriate to shift this to a “County Wide” initiative during the next update cycle.

Relates to Plan Goal(s) and Objectives: 6A, 6B, 7B

Implementer: Thurston County Resource Stewardship, Thurston County Public Works, Thurston County Central Services, and Thurston County Emergency Services

Estimated Cost: $7,500

Time Period: 2017 - 2020

Funding Source: Unknown

Source and Date: Natural Hazards Mitigation Plan for the Thurston Region (2009)

Adopted Plan Number: TC-MH 2

Reference Page: Thurston County - 32

Initiative and Implementation Status: Thurston County is working on completing the Emergency Support Functions for the Comprehensive Emergency Management Plan and coordinating and facilitating county departments’ Continuity of Operations Plans. Also, through the update process of this Mitigation plan and through the Executive Seminar series, there is improved communications and coordination between the jurisdictions in the county.
Hazard Addressed: Landslide Hazard
Category: Development Regulations

TC-LH 1: Limit activities in potential and historical landslide areas through regulation and public outreach.

Rationale: Thurston County is required by the state Growth Management Act (GMA) to protect Critical Areas. Geologic hazards such as landslides are a major concern along the county's marine shorelines and steep river and stream ravines. The areas with the most significant potential for landslide hazards are Black and Bald Hills, where forestry is the major land use. In 1992 Thurston County adopted development regulations for landslide hazards areas in its Critical Area Ordinance (CAO). An update of the county CAO was completed in 2012. GIS maps of landslide hazard were prepared for the county CAO, and comprehensive plan. These maps are being updated, and are available on-line from Thurston GeoData Center at www.geodata.org.

Relates to Plan Goal(s) and Objectives: 4A, 7A

Implementer: Thurston County Resource Stewardship

Estimated Cost: $15,000

Time Period: 2017 - 2022

Funding Source: Community Trade and Economic Development, annual budget of Resource Stewardship

Source and Date: Natural Hazards Mitigation Plan for the Thurston Region, Thurston County Annex (2009)

Adopted Plan Number: TC-LH 1

Reference Page: Thurston County - 30

Initiative and Implementation Status: In 1992 Thurston County adopted development regulations for landslide hazards areas in its Critical Area Ordinance (CAO). An update of the CAO is due by December 2010, to be compliant with the state GMA. GIS maps of landslide hazard were prepared for the CAO, and Comprehensive Plan. These maps are being updated, and are available on-line from Thurston GeoData Center at: www.geodata.org. In addition, Thurston County is working with the Washington State Department of Natural Resources to conduct a landslide assessment of the county to identify at risk areas.
Annex: Thurston County

Priority: 19 of 29
Status: Existing

Hazard Addressed: Multi Hazard
Category: Hazard Preparedness

TC-MH 1: Build a redundant network infrastructure at Tilley Road campus as an alternate site when a disaster hit and the Thurston County main courthouse campus data center becomes inoperable and unavailable.

Rationale: Thurston County departments and offices have identified mission critical applications as part of their assessment of essential business functions. Most of these applications reside on virtual servers (virtual machines or VM) housed at the primary site located at the main courthouse campus data center. Thurston County Information Technology (IT) has set up an alternate site for disaster recovery located at the Tilley Road campus. Currently, limited network resources and virtual server infrastructure are in place at the alternate site and there’s no replication set up between the VM infrastructure at the main courthouse and the Tilley Road campus. If an incident or disaster strikes and the network and VM infrastructure at the main courthouse is impacted, primary servers will be down interrupt critical/essential county functions due to unavailability of business applications.

With approval and funding of this initiative, Thurston County IT will be able to buy the necessary hardware and software to build adequate network virtual server infrastructure and storage at the Tilley campus to establish redundancy and replication between the primary and alternate sites. This would allow IT to be able to restore selected systems at the alternate site to allow some county departments and offices to resume critical and essential business functions in the event of a disaster or non-availability of the primary site.

Relates to Plan Goal(s) and Objectives: 1A, 2B, 2C, 5D

Implementer: Thurston County Central Services Information Technology (IT)

Estimated Cost: $50,000 (rough estimate)

Time Period: 2017-2022

Funding Source: Grants

Source and Date: Thurston County Information Technology Disaster Recovery (DR) Plan (2016)

Adopted Plan Number: N/A.

Reference Page: N/A

Initiative and Implementation Status: Thurston County IT is currently updating its DR plan and it includes relocation, coordination, support, and resumption of critical county functions and systems. Redundant network and infrastructure will be needed at an alternate site in order for IT to be able to restore and resume critical business systems and applications.
Annex: Thurston County

Priority: 20 of 29

Status: Existing

Hazard Addressed: Flood Hazard
Category: Hazard Damage Reduction

TC-FH 21: Study repetitive public losses, including residential structures, livestock, out-buildings and rescue costs not already identified by FEMA.

Rationale: FEMA's list of repetitive loss structures is very limited. This study would create a list of repetitive public cost which have been damaged or caused by floods over a longer period, or have received other types of services from the county.

Relates to Plan Goal(s) and Objectives: 7A, 7B

Implementer: Thurston County Resource Stewardship and Thurston County Emergency Services

Estimated Cost: $20,100

Time Period: 2017 - 2022

Funding Source: Unknown

Source and Date: Thurston County Flood Hazard mitigation Plan, December, 2012

Adopted Plan Number: FMI - 27

Reference Page: 9-8

Initiative and Implementation Status: Thurston County Emergency Services has been discussing the concept and approach, but at present no work program has been developed. Thurston County has started discussions with the Thurston Conservation District to address this initiative.
Hazard Addressed: Multi Hazard  
Category: Data Collection and Mapping

**TC-MH 5: Conduct a study to assess county private sector ability to meet public demand for critical resources in the event of supply chain disruption.**

**Rationale:** An incident or event could cause disruptions in supply chains resulting in the reduction of supplies of critical resources for Thurston County residents. A study would identify the location of critical supplies in-stock with in-county private/commercial wholesalers and retailers. This study could assist in identifying potential key partners in planning to create temporary supply chains to be activated in an emergency.

**Relates to Plan Goal(s) and Objectives:** 5D, 6B

**Implementer:** Thurston County Emergency Management

**Estimated Cost:** $30,000 (estimate)

**Time Period:** 2017 - 2022

**Funding Source:** Grants and local funding

**Source and Date:**

**Adopted Plan Number:**

**Reference Page:**

**Initiative and Implementation Status:** New
**Priority:** 22 of 29

**Annex:** Thurston County  
**Status:** Existing

**Hazard Addressed:** Flood Hazard  
**Category:** Development Regulations

**TC-FH 12:** Work with others to determine the width and conditions of buffers along river and stream shorelines.

**Rationale:** This recognizes the listing of certain salmon stocks under the Federal Endangered Species Act in Puget Sound and the potential for similar actions on all rivers within Thurston County and the importance of the Puget Sound Partnership objectives for improving the Sound. It also acknowledges the importance of forests along these shorelines for quality fish habitat. As documented in the Budd Inlet-Deschutes River Watershed Action Plan (1995), issues of bank erosion, water quality and salmon habitat are all directly related to the presence or absence of a forested canopy along the river. These new or revised regulations would likely become a part of the Thurston County Critical Areas Ordinance.

**Relates to Plan Goal(s) and Objectives:** 4C, 7A, 8B

**Implementer:** Thurston County Resource Stewardship

**Estimated Cost:** $25,000

**Time Period:** 2017 - 2019

**Funding Source:** Community Trade and Economic Development and grants

**Source and Date:** Thurston County Flood Hazard Management Plan (1999); Resolution #11947

**Adopted Plan Number:** MR-9

**Reference Page:** VIII-13

**Initiative and Implementation Status:** Thurston County has been working to update its Critical Areas Ordinance (CAO) regulations, as a part of a required update for the Growth Management Act and the Shoreline Management Plan (SMP). Both documents will include regulations and practices which include stream buffers, based upon “Best Available Science”.
Annex: Thurston County

Priority: 23 of 29

Status: Existing – In Progress

Hazard Addressed: Flood Hazard
Category: Plan Coordination and Implementation

TC-FH 4: Continue to be actively involved in the multiple jurisdiction flood hazard reduction efforts within the Chehalis River Basin Flood Authority.

Rationale: Thurston County has been involved with federal, state, local and tribal jurisdictions to seek ways of reducing flood hazards along the Skookumchuck and Chehalis Rivers. Thurston County stakeholders seek comprehensive solutions. Measures that benefit stakeholders outside the Thurston Region must not produce adverse environmental conditions to the detriment of stakeholders down river from project areas.

Relates to Plan Goal(s) and Objectives: 4D

Implementer: Thurston County Resource Stewardship

Estimated Cost: $4,500

Time Period: 2017 - 2022

Funding Source: Annual budget and outside funding

Source and Date: Natural Hazards Mitigation Plan for the Thurston Region – Thurston County Annex, 2009

Adopted Plan Number: TC-FH 4

Reference Page: Thurston County - 29

Initiative and Implementation Status: Thurston County continues to be involved with flood studies, the program Flood Advisory Board, and public information activities of adjacent counties regarding the potential for floods within the Chehalis basin.
TC-FH 9: Develop mapping protocols to archive all flood maps and data sets so they can be reused later.

Rationale: As Thurston County adds an increasing number of data layers to its GIS system there will be an increasing need to label and maintain digital archives of all flood maps. While hard copies of old GIS maps may exist, the National Flood Insurance Program and the CRS programs will require the reuse of old data sets to identify repetitive loss structures, which could be targeted for voluntary buy-out or elevation programs.

Relates to Plan Goal(s) and Objectives: 7A

Implementer: Thurston County Central Services – Thurston GeoData Center and Thurston Regional Planning Council

Estimated Cost: $8,000

Time Period: 2017 - 2022

Funding Source: Uncertain, potential grants and program annual budgets

Source and Date: Thurston County Flood Hazard Management Plan Dec. 2012

Adopted Plan Number: FMI - 15

Reference Page: 9 - 6

Initiative and Implementation Status: Technologies for field data collection, mapping display and analysis, and data storage are being reviewed and evaluated. However, material on historical flood loss has not been organized. GIS maps for critical facilities and repetitive loss structures were prepared for this Natural Hazard Mitigation Plan. It is likely that there will be additional requests for GIS maps of tabular data. Thurston County now is documenting high water marks from floods on a website at http://www.co.thurston.wa.us/permitting/flood/flood-photos.html. Thurston County has also partnered with FEMA on RISKMAP projects to remodel and revise the floodplains and risk assessments for the Deschutes, Chehalis and Lower Black rivers, Scatter Creek, and the Marine Coastal shorelines of Thurston County. The Nisqually River is proposed for a 2017 project start.
Annex: Thurston County

**Priority:** 25 of 29

**Hazard Addressed:** Multi Hazard

**Category:** Hazard Preparedness

**TC-MH 7:** Develop plans to address the medical needs of people who rely on electrically powered medical equipment and/or do not have dependable transportation.

**Rationale:** Recent disasters have highlighted the importance of planning for people with medical needs during times of disaster. People dependent on electric medical equipment are especially vulnerable during power outages and transportation disruptions.

This initiative will create strategies, plans, practices and education for assisting this unique population, their families, guardians and care givers. It will specifically address those who need dialysis, but do not have dependable transportation during times of disaster. It will consider specific requirements, legislative guidelines, best practices, and lessons learned. It will include procedures for coordinating with utilities when wind storms or winter storms down trees across roadways.

**Relates to Plan Goal(s) and Objectives:** 2A, 5B, 8A

**Implementer:** Thurston County Emergency Services, Thurston County Public Health and Social Services, LMTAAA (Lewis, Mason, Thurston Area Agency on Aging).

**Estimated Cost:** Unknown

**Time Period:** 2016 - 2019

**Funding Source:** Grants and Local Match

**Source and Date:** N/A

**Adopted Plan Number:** N/A

**Reference Page:** N/A

**Initiative and Implementation Status:** New
Priority: 26 of 29

Hazard Addressed: Multi Hazard
Category: Hazard Preparedness

TC-MH 3: Improve the capability to identify moderate to long term road impedances, and put them into the CAD (Computer Aided Dispatch).

Rationale: Reducing the response times of Emergency medical services, fire, and law enforcement personnel saves lives and protects property. Unscheduled delays caused by floodwaters over roadways and earthquake damage to roads and bridges put lives and property in jeopardy.

Impedances are used by the county's Computer Aided Dispatch (CAD) system when it performs routing calculations prior to selecting which response units to dispatch. This initiative will identify and program roadway closure scenarios that are likely to impede response times to enhance more effective routing capabilities.

Relates to Plan Goal(s) and Objectives: 2A,

Implementer: Thurston Communications E9-1-1, Thurston County Public Works and Thurston County Emergency Management.

Estimated Cost: Unknown

Time Period: 2017 - 2022

Funding Source: Grants and Local Match

Source and Date: Natural Hazards Mitigation Plan for the Thurston Region – Thurston County Annex, 2009

 Adopted Plan Number: TC – MH 3

Reference Page: Thurston County - 35

Initiative and Implementation Status: Thurston County Public Works has created a roads status website http://www.co.thurston.wa.us/publicworks/2015/RoadStatusMap.aspx This website and content has been provided to TCOMM E911 to utilize in there dispatch facility. The website is still being enhanced and information flow for updating needs to be streamlined.
Priority: 27 of 29

Hazard Addressed: Flood Hazard
Category: Development Regulations

TC-FH 13: Draft a Comprehensive Plan policy which encourages the creation and use of wetland mitigation bank.

Rationale: This proposal would shift the county’s approach away from small, independent wetland and stream mitigation projects with each road and bridge improvement project. There would be cost and environmental advantages to grouping these incremental projects into an improved site(s) within one or several watersheds. This would allow for the development of a “wetland mitigation bank” for county-owned projects. While currently an option within the Thurston County Critical Area Ordinance, a policy basis would be needed before grants for such a project could be obtained.

Relates to Plan Goal(s) and Objectives: 8B

Implementer: Thurston County Resource Stewardship and Public Works

Estimated Cost: $5,000

Time Period: 2017 - 2022

Funding Source: Annual budget for Resource Stewardship

Source and Date: Natural Hazards Mitigation Plan for the Thurston Region – Thurston County Annex, 2009

Adopted Plan Number: TC-FH 13

Reference Page: Thurston County - 46

Initiative and Implementation Status: The Washington Department of Ecology developed a draft rule to help guide local governments, but in 2002 abandoned that process due to budgetary constraints. However, Thurston County has continued exploring the use and utility of wetland mitigation banks. Guidance for wetland mitigation banking is being worked on for the sever year Comprehensive Plan update scheduled for 2011, the Shoreline Management Plan update in 2010, it is incorporated in the Watershed Characterization Program, and is informally evaluated by Thurston County Public Works when they have appropriate road projects.
Hazard Addressed: Multi Hazard  
Category: Hazard Preparedness

**TC-MH 6: Conduct a study of private roads and bridges to determine their capacity to provide access to emergency vehicles**

**Rationale:** During disasters, emergency responders are required to gain access to the scene of the emergency by traversing private roads and bridges. Too often, these roads and bridges have not been constructed or maintained in accordance with state or county standards, nor designed by a licensed engineer. As a result, they pose a risk to response personnel and equipment. Additionally, state law does not allow fire equipment to travel across bridges that do not have their capacity posted.

This initiative will inventory, assess and develop post seismic inspection plans for private roads and bridges used by responders during disasters. Additionally, it will identify funding sources to replace or retrofit roads and bridges that do not meet established criteria and to post bridge capacity information.

**Relates to Plan Goal(s) and Objectives:** 2A, 6B

**Implementer:** Thurston County Emergency Services

**Estimated Cost:** $100,000

**Time Period:** 2017 - 2022

**Funding Source:** Grants and Local Match

**Source and Date:** Natural Hazards Mitigation Plan for the Thurston Region – Thurston County Annex, 2009

**Adopted Plan Number:** TC – MH 6

**Reference Page:** Thurston County - 37

**Initiative and Implementation Status:** Project no started. Thurston County Emergency Management has started coordinating with the Thurston Conservation District to conduct a needs assessment of private property projects.
Priority: 29 of 29

Hazard Addressed: Flood Hazard
Category: Plan Coordination and Implementation

TC-FH 2: Secure funding for flood related projects within the 20-year Stormwater Capital Facilities Plan.

Rationale: The current Stormwater Utility Rate will provide funding for all the high and medium priority projects in the Capital Facilities Plan (CFP). These projects were first identified in the various drainage basin plans. In 1998, the scope of works and cost estimates for all stormwater projects were reviewed and updated. These were adopted in 2000.

Relates to Plan Goal(s) and Objectives: 4C, 7D

Implementer: Thurston County Storm and Surface Water Utility

Estimated Cost: $650,000/year

Time Period: 2017 - 2022

Funding Source: Thurston County – Storm and Surface Water Utility

Source and Date: Natural Hazard Mitigation Plan for the Thurston Region – Thurston County Annex 2009

Adopted Plan Number: TC-FH 2

Reference Page: Thurston County - 40

Initiative and Implementation Status: The Thurston County Board of County Commissioners adopted a Capital Facilities Plan to implement this initiative in 2000 and was re-authorization during 2004. The highest seven priorities have been completed. The CFP still has approximately $7,500,000 in proposed projects to be completed. Completion is estimated in 2022.
Mitigation Initiatives – Completed or Removed

Initiatives that were completed or no longer necessary and removed by Thurston County are not part of the county’s adopted mitigation strategy. The county completed five and removed five other initiatives. They are included in this section to document progress made and changes in the county’s mitigation strategy since the plan was last updated.

<table>
<thead>
<tr>
<th>Status</th>
<th>ID Number</th>
<th>Category</th>
<th>Initiative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Completed</td>
<td>TC-EH 1</td>
<td>Earthquake Hazard</td>
<td>Perform preliminary evaluations of county owned critical facilities to identify seismic vulnerabilities in those structures.</td>
</tr>
<tr>
<td>Completed</td>
<td>TC-MH 4</td>
<td>Multi-Hazard</td>
<td>Improve alert and warning capabilities.</td>
</tr>
<tr>
<td>Completed</td>
<td>TC-FH 24</td>
<td>Flood Hazard</td>
<td>Develop a southeast flood detour plan for the Thurston County Comprehensive Emergency Management Plan.</td>
</tr>
<tr>
<td>Completed</td>
<td>TC-FH 3</td>
<td>Flood Hazard</td>
<td>Expand the Thurston County Stormwater Utility rate boundary to include all unincorporated areas.</td>
</tr>
<tr>
<td>Completed</td>
<td>TC-FH 5</td>
<td>Flood Hazard</td>
<td>Install and maintain flood elevation poles and staff gauges along major rivers and within chronic groundwater flooding areas.</td>
</tr>
<tr>
<td>Removed</td>
<td>TC-EH 2</td>
<td>Earthquake Hazard</td>
<td>Develop a public outreach program for earthquake preparedness.</td>
</tr>
<tr>
<td>Removed</td>
<td>TC-FH 6</td>
<td>Flood Hazard</td>
<td>Prepare and distribute public information program which focuses on the consequences of floods.</td>
</tr>
<tr>
<td>Removed</td>
<td>TC-FH 19</td>
<td>Flood Hazard</td>
<td>Develop a warning system for the Nisqually and Skookumchuck River dams with their property owners, the Department of Ecology, the downstream communities and residents.</td>
</tr>
<tr>
<td>Removed</td>
<td>TC-SH 1</td>
<td>Storm Hazard</td>
<td>Develop a public outreach program for storm preparedness.</td>
</tr>
<tr>
<td>Removed</td>
<td>TC-FH 23</td>
<td>Flood Hazard</td>
<td>Acquire MIKE 11, a three-dimensional hydrological modeling software package and AQUARIUS, a USGS standard streamflow modeling software package.</td>
</tr>
</tbody>
</table>
Hazard Addressed: Earthquake Hazard
Category: Critical Facilities Replacement / Retrofit

TC-EH 1: Perform preliminary evaluations of county owned critical facilities to identify seismic vulnerabilities in those structures. Implement appropriate retrofitting/strengthening measures to improve their ability to withstand the effects of earthquakes.

Rationale: Critical facilities may play a major role in the response and recovery phases of a disaster and community assistance. It is essential that these facilities are functional after a disaster. At a minimum the critical facilities which would be screened include the Thurston County Courthouse complex, Tilley Shop, Capcom, two sewage treatment facilities, and a water system at Ground Mound. The county already maintains a seismic evaluation on each of the bridges in unincorporated Thurston County.

Relates to Plan Goal(s) and Objectives: 3B, 4C
Implemender: Thurston County Central Services

Estimated Cost: $20,000

Time Period: 2010 - 2015

Funding Source: Grants and annual budgets

Source and Date: Natural Hazards Mitigation Plan for the Thurston Region (2003)

Adopted Plan Number: TC-EH 1

Reference Page: V-153

Initiative and Implementation Status: Thurston County has completed facility inspections for the Courthouse complex, Tilley Shop, TCOMM 9-1-1, Mottman Building, Building 5, two sewage treatment facilities and a water system at Ground Mound. These facilities have been prioritized based on vulnerabilities. Thurston County is starting a program to correct vulnerabilities as mitigation funds become available. Thurston County will continue to update their facility workplan and priority list as projects are completed and as new facilities are acquired.
Priority: N/A

Hazard Addressed: Multi Hazard
Category: Hazard Damage Reduction

TC-MH 4: Improve alert and warning capabilities.

Rationale: During disasters, local officials and emergency managers must provide the public with information quickly. The advent of new media has brought a dramatic shift in the way the public consumes information. In addition to audio, digital media via the internet, and email, text messaging is an increasingly popular form of communication. This initiative will provide for an alert and warning system for all hazards that is capable of geographic-based notifications using multiple communications media. It will also provide alert and warning to those with disabilities and to those without an understanding of the English language.

Relates to Plan Goal(s) and Objectives: 5B
Implementer: Thurston County Emergency Services

Estimated Cost: $25,000 annually

Time Period: 2015-2020

Funding Source: Grants, Local Match and program budgets

Source and Date: N/A Adopted

Plan Number: N/A. Reference

Page: N/A.

Initiative and Implementation Status: This initiative replaces TC-FH 19. Thurston County Emergency Services has coordinating an effort to purchase an Alert/Notification system. This system is utilized by all local jurisdictions within Thurston County.
Annex: Thurston County

Priority: N/A
Status: Completed

Hazard Addressed: Flood Hazard
Category: Plan Coordination and Implementation


Rationale: During a major flood event in the Nisqually Watershed, Bald Hills Road SE, a county arterial, is closed due to flooding of Lackamas Creek. This road closure can potentially isolate or severely limit travel for thousands of southeast Thurston County residents. By establishing flood detour routes through privately owned forest lands, essential surface transportation system redundancy can provide temporary mobility options for the affected population.

Relates to Plan Goal(s) and Objectives: 1A, 3D, 8A

Implementer: Thurston County Emergency Management Division

Estimated Cost: $5,000

Time Period: Completed Nov. 2012

Funding Source: Unknown Source and Date: N/A

Adopted Plan Number: N/A

Reference Page: N/A

Initiative and Implementation Status: Thurston County Emergency Management has developed a “Memorandum of Understanding” with Weyerhaeuser, a private forest owner, to use their truck line as a detour route after a disaster has isolated that community the Clear Lake and surrounding community.
Annex: Thurston County

Priority: N/A

Hazard Addressed: Flood Hazard

Category: Plan Coordination and Implementation

TC-FH 3: Expand the Thurston County Stormwater Utility rate boundary to include all unincorporated areas.

Rationale: This recommendation is not without some controversy. It is not consistent with the 1997 South Thurston County Water Focus Group Report which recommended that Thurston County fund water issues in the “south county through existing county tax dollars - the general fund.” The limited nature of county financial resources was the central reason for the creation of a countywide Storm and Surface Water Utility in 1989. Past projects and activities have been limited to the utility rate boundary in north county, except for emergency work for the Hopkins and Hickman Ditch areas (Salmon Creek Drainage) in 1996/97 due to high groundwater flooding. Records indicate that flooding and high groundwater problems are becoming more acute throughout rural unincorporated areas. The expansion of the rate boundary would provide equity throughout the county and would help fund south county projects or activities which are currently not financially feasible.

Relates to Plan Goal(s) and Objectives: 6A, 6D

Implementer: Thurston County Board of County Commissioners

Estimated Cost: $20,000

Time Period: 2004 - 2008

Funding Source: Thurston County Storm and Surface Water Utility

Source and Date: Thurston County Flood Hazard Management Plan (1999); Resolution #11947

Adopted Plan Number: IM-3

Reference Page: VIII-5

Initiative and Implementation Status: January 1, 2008 Thurston County approved a county-wide Stormwater Utility.
TC-FH 5: Install and maintain flood elevation poles and staff gauges along major rivers and within chronic groundwater flooding areas.

**Rationale:** Staff gauges are an essential part of flood preparedness and equally important as an emergency backup to the automated USGS stations. Staff gauges are also an important element of education as a year-round reminder of the winter character of each of our local rivers. Having flood elevation poles will be important within chronic groundwater flooding areas. Floods in Thurston County have on average destroyed one gauging station during each of the most recent flood events. Budget cuts over the past decade have resulted in incomplete records, with significant events occurring when the stations have been turned off. This is also a problem in the summer where low flows can affect fisheries habitat. It is important that river gauges which the county and others rely upon for flood information are upgraded to provide real time data. The Deschutes River is the only major river which does not have multiple gauges connected to the GOES weather satellite. The gauge at the “E” Street Bridge in Tumwater does not provide any telemetry, but few rely on this gauge. The gauge at Rainier is critical. It has been upgraded, but the phone line necessary to get the flood stage data was not installed. The Washington State Department of General Administration relies on this gauge as an input to its METASYS software which controls the tide gates at the Capitol Lake dam. Poor data in this situation may lead to potential flooding in downtown Olympia.

**Relates to Plan Goal(s) and Objectives:** 8A

**Implementer:** Thurston County Emergency Services

**Estimated Cost:** $47,000 (NOTE: Not including the “E” St Bridge)

**Time Period:** 2004 - 2008

**Funding Source:** Unknown

**Source and Date:** Thurston County Flood Hazard Management Plan (1999); Resolution #11947

**Adopted Plan Number:** PI-1

**Reference Page:** VIII-6

**Initiative and Implementation Status:** This work has been completed. -Thurston County has been working with several agencies to provide “real time” data to local and State government managers and to find funding to operate the Rainier gauging stations year-round.
Hazard Addressed: Earthquake Hazard  
Category: Public Information

TC-EH 2: Develop a public outreach program for earthquake preparedness.

Rationale: The county would need to develop public outreach materials for earthquake hazards. Key activities include encouraging the reduction of nonstructural and structural earthquake hazards in homes, schools, businesses, and government offices, along with the purchase of earthquake hazard insurance. This outreach program would be like the material that has been developed for flood hazards. It has been proven that doing structural and non-structural mitigation activities, citizens, businesses, government and academia would all reduce and in some cases, eliminate loss of property and life and reduce recovery time and costs. Regarding the purchase of insurance, the pertinent question for residents of Thurston County is not “if” a catastrophic earthquake will occur, but “when.” Most homeowners’ insurance does not cover earthquake damage as part of its basic plan. Encouraging the purchase of earthquake coverage will help our community recover from a devastating quake.

Relates to Plan Goal(s) and Objectives: 8A

Implementer: Thurston County Emergency Services

Estimated Cost: $42,000 (NOTE: $8,500 Annually)

Time Period: 2004 - 2008

Funding Source: Pre-Hazard Mitigation Grant and EMC funds

Source and Date: Natural Hazards Mitigation Plan for the Thurston Region (2003)

Adopted Plan Number: TC-EH 2

Reference Page: V-155

Initiative and Implementation Status: The function of this initiative has been replaced by a county wide imitative, CW-MH 6.
Priority: N/A

Status: Removed

Hazard Addressed: Flood Hazard
Category: Public Information

TC-FH 6: Prepare and distribute public information program which focuses on the consequences of floods.

Rationale: There is a need to continually provide citizens current information on: the consequences of living in a flood plain; the National Flood Insurance program; and the county’s flood related activities. This is especially true in the areas of low cost housing that has a transient population.

Relates to Plan Goal(s) and Objectives: 8A

Implementer: Thurston County Emergency Services

Estimated Cost: $25,000 (Note: $5,000 Annually)

Time Period: 2004 - 2008

Funding Source: Unknown

Source and Date: Thurston County Flood Hazard Management Plan (1999)

Adopted Plan Number: PI-4

Reference Page: VIII-7

Initiative and Implementation Status: The function of this initiative has been replaced by a countywide initiative, CW-MH 6.
Priority: N/A          Status: Removed

**Hazard Addressed:** Flood Hazard  
**Category:** Hazard Damage Reduction

**TC-FH 19:** Develop a warning system for the Nisqually and Skookumchuck River dams with their property owners, the Department of Ecology, the downstream communities and residents.

**Rationale:** With the large population, downstream from the dams, an adequate warning system is essential. This need is independent of any proposal to modify the structures and/or add storage capacity to the dams.

Systems for both rivers would require coordination with the adjacent counties and local governments and tribal entities. The cost listed below would be for only the Thurston County portion of such a system.

**Relates to Plan Goal(s) and Objectives:**

**Implementer:** Thurston County Emergency Management

**Estimated Cost:** $100,000t

**Time Period:** 2004-2008

**Funding Source:** Unknown

**Source and Date:** Thurston County Flood Hazard Management Plan (1999)

**Adopted Plan Number:** FP-1.

**Reference Page:** VIII-17

**Initiative and Implementation Status:** This initiative has been incorporated into TC-MH 4 for multi-hazard alert and warning capabilities.
Priority: N/A                                               Status: Removed

Hazard Addressed: Severe Storm Hazard
Category: Public Information

TC-SH 1: Develop a public outreach program for storm preparedness.

Rationale: The county would need to develop public outreach materials for earthquake hazards. This would be like the material that has been developed for flood hazards. Prepare and distribute public education materials regarding protecting life, property, and the environment from storm events. Place links to this material on the Thurston County home page.

Relates to Plan Goal(s) and Objectives: 8A

Implemener: Thurston County Emergency Services

Estimated Cost: $42,500 (NOTE: $8,500 Annually)

Time Period: 2004 - 2008

Funding Source: Unknown

Source and Date: Natural Hazards Mitigation Plan for the Thurston Region (2003)

Adopted Plan Number: TC-SH 1

Reference Page: V-207

Initiative and Implementation Status: The function of this initiative has been replaced by a countywide imitative, CW-MH 6.
TC-FH 23: Acquire MIKE 11, a three-dimensional hydrological modeling software package and AQUARIUS, a USGS standard streamflow modeling software package.

**Rationale:** Numerical hydrological models will provide data to better inform land use decisions that will serve to protect environmentally critical areas and protect the public’s health. Model forecasts and simulations will enhance Thurston County’s understanding of the timing, frequency, duration, and location of high groundwater and riverine flooding. Models can also be used to safeguard municipal water sources by examining the conditions that cause groundwater contamination from various pollutants. In addition, models are critical for forecasting future water supply from a variety of ground- and surface water sources. This information can enable water resource managers and the public to more effectively adapt to changes in water supply that are likely to be affected by the effects of climate change.

**Relates to Plan Goal(s) and Objectives:** 2A, 2C, 3A, 5A

**Implementer:** Thurston County Resource Stewardship, Thurston County Storm and Surface Water Utility, Thurston County Public Works, Thurston County Emergency Services

**Estimated Cost:** MIKE 11 $6,000; AQUARIUS $10,000 (modeling will be covered in program annual budgets)

**Time Period:** 2010 - 2015

**Funding Source:** Grants, local match, program annual budgets

**Source and Date:** N/A

**Adopted Plan Number:**

**N/A Reference Page:** N/A

**Initiative and Implementation Status:** Other modeling software was acquired by the county.
Thurston County Implementation of the National Flood Insurance Program

Introduction

All Local Mitigation Plans approved by FEMA after October 1, 2008 must address each jurisdiction’s participation in the NFIP and must identify, analyze and prioritize actions related to continued compliance with the NFIP. Basic compliance NFIP actions could include, but are not limited to:

- Adoption and enforcement of floodplain management requirements, including regulating all and substantially improved construction in Special Flood Hazard Areas (SFHAs);
- Floodplain identification and mapping, including any local requests for map updates, if needed; or
- Description of community assistance and monitoring activities

National Flood Insurance Program Participation

Thurston County government has actively participated in the National Flood Insurance Program (NFIP) since September 1974 (Attachment 1) and the Community Rating System (CRS) program since 2000. Thurston County has a Class 2 rating in the CRS program as of November 2016. A Class 2 rating saves policyholders 40% or an average of approximately $500 per policy in unincorporated Thurston County. Thurston County government has made a concerted effort to exceed minimum floodplain management requirements, provide increased public awareness regarding the local flood hazard, and provide protection from flooding.

Approximately 7% of Thurston County is in a mapped NFIP 100-year floodplain, of which about 90% is in unincorporated Thurston County. Currently there are 18 repetitive loss properties within unincorporated Thurston County and there are 2 properties that meet the severe repetitive loss criteria as of December 2016. In November 2008, Thurston County received a Community Block Grant from the Washington State Department of Community Trade and Economic Development. The grant provides funding to elevate approximately 30 to 47 residences in the Chehalis and Deschutes River Basins that were damaged by the December 2007 Flood. The first floor above the crawlspace must be 24” above the FEMA mapped elevation for the property or the highest known flood level, whichever is greater. The grant will serve to prevent future flood damage to residences in the affected areas and therefore reduce the number of potential repetitive loss structures.

Thurston County government will continue to participate in both the NFIP and the CRS program because they are integral to current and future flood mitigation efforts within the unincorporated portion of Thurston County. In addition, the hazard mitigation strategy for unincorporated Thurston County is based upon continued participation and compliance with the National Flood Insurance Program as well as the Community Rating System program.

Thurston County is also partnering with FEMA in several Risk MAP projects. In September 2016 Thurston County adopted the remodel and revised NFIP maps for the Deschutes River watershed in Thurston County. Presently Thurston County is working with FEMA on two other Risk MAP projects. Farthest along is the Marine Coastal remodel and remap of the NFIP floodplains. This project is starting the public comment phase and is anticipated to be at the adaptation phase by fourth quarter 2017. The other is the Lower Chehalis River project which includes the Skookumchuck River, Scatter Creek, and the lower portion of the Black River. Preliminary work maps have been prepared and discussed with the
local jurisdictions, adoption is expected in the second quarter of 2018. A fourth project, the Nisqually River, is expected to start later in 2017.

**Flood Plans, Ordinances, and Regulations**

A large portion of Thurston County is located within the 100-year floodplain. In addition, portions of the county are located within a designated floodway or are in a coastal high-hazard V zone. Since 1972, Thurston County has been declared a federal disaster area for floods 14 times resulting in substantial losses. Through federal and state grants, several repetitive loss properties, in areas prone to flooding, have been purchased by the county and the buildings either demolished or removed. Also, through the same grant sources several flood damaged houses have been raised two feet above base flood elevation to prevent further damage in future flood events. Because of the strong efforts in flood hazard mitigation Thurston County did not meet the minimum damage requirements of the last two Federal Disaster Declarations for Western Washington in November and December of 2015.

Thurston County has a strong framework of policies and laws that help reduce property damage due to floods as well as protecting the natural functions of floodplains. Beginning with the Thurston County Comprehensive Plan, which contains the following Goal, Objective and Policies that pertain to floodplains:

**GOAL:** Protect life and structures from flood hazards and retain the flood storage, transmission capacity, and habitat value of floodplains.

**OBJECTIVE:** To provide the highest degree of flood protection at the least cost.

**POLICIES:**

1. The county should provide the highest degree of flood protection at the least cost through identification and accommodation of natural flooding and channel migration processes that pose hazards to life or property. Protection and management should be based on best available science and cumulative impact assessments of existing and planned future land and resource uses within the floodplains, channel migration zones, and watersheds.

2. The county should prohibit development and emplacement of fill in floodways and floodplains, except to the minimum extent necessary to accommodate public infrastructure and utilities that cannot be accommodated elsewhere and to stabilize channels against erosion to protect existing agricultural lands, public roads and bridges, public infrastructure, utilities and significant private structures, and to achieve habitat enhancement. Any development in the floodways should be designed to avoid habitat degradation. Stream bank stabilization, if necessary, should be of a type that maintains or enhances habitat functions. Rip-rap and other hard armoring should only be used if there is no effective alternative, based on sound engineering principles, to protect existing structures or public facilities.

3. The county should provide for land uses such as forestry, open space, public recreation, existing agriculture and water-dependent uses in areas subject to river flooding to minimize risks to life and structures and help retain or enhance habitat functions. Other uses and development in the floodplain should be restricted to minimize public safety risks (e.g., through compensating design features) and loss of habitat function.
### Summary of National Flood Insurance Program Premiums, Policies, and Claims in Unincorporated Thurston County

<table>
<thead>
<tr>
<th>Flood Zone Classification</th>
<th>Policies in Force</th>
<th>Premium Insurance in Force</th>
<th>Number of Closed Paid Losses</th>
<th>$ of Closed Paid Losses</th>
<th>Adjustment Expense</th>
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<tr>
<td>A01-30 and AE</td>
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<td>$94,482</td>
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<tr>
<td>V01-30 and VE</td>
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<td>$3,414,337.00</td>
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</table>

### Summary of Repetitive Loss Properties in Unincorporated Thurston County

<table>
<thead>
<tr>
<th>Flood Zone Classification</th>
<th>RL Buildings (Total)</th>
<th>RL Buildings (Insured)</th>
<th>RL Losses (Total)</th>
<th>RL Losses (Insured)</th>
<th>RL Payments (Total)</th>
<th>RL Payments (Insured)</th>
<th>Building Contents</th>
<th>Building Contents</th>
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<td>B, C, X</td>
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<td>$147,665.76</td>
<td>$531,325.21</td>
</tr>
</tbody>
</table>

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4. The county should minimize disruption of long-term stream channel migration processes that allow formation of essential habitat features by prohibiting construction of new structures in channel migration zones and minimizing streambank stabilization.

5. The county should actively participate in the multi-jurisdictional flood hazard reduction efforts within the Chehalis River Basin.

6. The county should regulate uses in and around areas where groundwater periodically surfaces as necessary to avoid property damage and protect groundwater quality.

7. The county should maintain the county’s enrollment in the Community Rating System through the National Flood Insurance Program.

Thurston County Codes as they pertain to restrictions to building in the floodplain includes:
Thurston County Code Chapter 14.38 Development in Flood Hazard Areas is part of the county’s Building Code. It includes the following intent and purpose:

It is the purpose of this chapter to promote the public health, safety and general welfare, and to minimize losses due to flood conditions in specific areas by provisions, which will:

1. Require that uses vulnerable to floods, including public facilities, which serve such uses, be provided with flood protection at the time of initial construction;

2. Restrict or prohibit uses, which are dangerous to human health, safety or property in times of flood, or cause increased flood heights or velocities;

3. Control filling, grading, dredging and other development, which may increase flood damage;

4. Control the alteration of natural floodplains, stream channels and natural protective barriers, which help accommodate or channel floodwaters;

5. Alert individuals to lands, which are in areas of special flood hazard.

Thurston County’s Critical Areas Ordinance (Chapter 17.15) identifies floodplains as a critical area. The Critical Areas Ordinance includes the following restrictions to protect floodplain functions:

Chapter 17.15.865 (F) (Special Management Areas – High Groundwater Flood Hazard Area Standards: All new structures shall be set back a minimum of fifty feet from the boundary of any designated high ground water flood hazard area. All residential structures within three hundred feet of a designated high ground water flood hazard area shall have the lowest floor, including basement, elevated a minimum of two feet above the known high ground water flood elevation

Chapter 17.15.900 (Floodplains, Streams, and Wetlands) – Purpose: It is the policy of Thurston County to accomplish the following: A. To preserve natural flood control, stormwater storage and drainage or stream flow.

Chapter 17.15.925 prohibits fill, single family residences, utility facility, and agricultural buildings in a floodplain.
Chapter 17.15.935 retains the natural buffers for one hundred feet from the ordinary high water mark for Type 1, 2, and 3 streams, fifty-feet for Type 4 streams, and twenty-five feet for Type 5 streams.

In the event a structure is built within the floodplain due to a Reasonable Use Exemption Chapter 17.15.1005 B (Flood proofing Certificate) requires a registered professional engineer’s or architect’s certification that the structure is constructed in accordance to Thurston County’s Code 14.38.040.

Thurston County Community Rating System Mitigation Activities

The following activities are carried out as part of Thurston County’s participation in the NFIP Community Rating System program to further reduce the effects of flooding in the unincorporated portions of Thurston County.

1. **Elevation Certificates**: Thurston County maintains elevation certificates for new and substantially improved buildings. Copies of elevation certificates are made available upon request and may be viewed on the county website.

2. **Map Information**: Thurston County furnishes flood zone information from the community’s latest Flood Insurance Rate Map (F.I.R.M.), annually publicizes the service and maintains records.

3. **Outreach Projects**: A brochure is mailed annually to all properties in the Special Flood Hazard Area. Flood hazard information is also provided through displays at public buildings and the annual County Fair. Thurston County also has flood insurance and general flood information on its Development Services Department and Emergency Management websites.

4. **Hazard Disclosure**: Thurston County recognizes the disclosure requirements of the State of Washington disclosure law.

5. **Flood Protection Information**: Documents relating to floodplain management and locally pertinent flood issues are available throughout the Timberline Regional Library system.

6. **Flood Protection Assistance**: Thurston County provides technical advice and assistance to interested property owners and annually publicizes the service.

7. **Additional Flood Data**: Thurston County maintains a high-level restrictive floodway and floodplain standard and uses the flood of record elevations when applying its regulations. Thurston County is a participant in the Cooperating Technical Partnership (C.T.P.) Program.

8. **Open Space Preservation**: Thurston County is preserving approximately 8,422 acres in the special flood hazard area as open space.

9. **Higher Regulatory Standards**: Thurston County enforces regulations that require freeboard for new construction and substantial improvement, protection of critical facilities, natural and beneficial functions, other higher regulatory standards, land development criteria and state mandated regulatory standards.

10. **Floodplain Delineation and Update**: Thurston County continues to work with FEMA to remodel and remap NFIPs. Deschutes River has been completed and adopted as of December 2016, both the Marine Coastal and Lower Chehalis River projects are underway and the Nisqually is expected to start in the 3rd quarter of 2017.

11. **Flood Data Maintenance**: Thurston County has established and maintains a system of elevation reference marks and maintains copies of all previous F.I.R.M. maps and Flood Insurance Study Reports.

12. **Stormwater Management**: The State of Washington has instituted a Clean Water Program and the County has adopted the Department of Ecology’s Stormwater Manual for Puget Sound. The
county enforces regulations for stormwater management, freeboard in non-special flood hazard area zones, soil and erosion control and water quality.

13. **Repetitive Loss**: As of the NFIP Report of Repetitive Losses provided by FEMA for December 2016, Unincorporated Thurston County has 18 repetitive loss properties.

14. **Acquisition and Relocation**: Thurston County has acquired and demolished or removed 22 properties in the Nisqually and 1 in the Deschutes flood hazard areas thus removing them from the repetitive loss roster.

15. **Flood Protection**: Thurston County receives credit for buildings that have been elevated or otherwise modified to protect them from flood damage.

16. **Drainage System Maintenance**: Thurston County’s drainage system is inspected regularly throughout the year and maintenance is performed as needed by the Thurston County Public Works Department. Records are maintained for both inspections and required maintenance. The Thurston County’s Comprehensive Plan Chapter 6 - Capital Facilities Plan is a financial planning and budgeting tool that includes capital drainage improvement projects. The County also enforces a regulation prohibiting dumping in the drainage system.

17. **Flood Warning Program**: Thurston County provides a program for timely identification of impending flood threats, disseminating warnings to appropriate floodplain residents and coordinating flood response activities.


Thurston County is in the process of updating its Flood Hazard Mitigation Plan. A draft plan is expected to be completed by October, 2017. Additional Documentation summarizing Thurston County’s last Community Assistance Visit is summarized in a Washington Department of Ecology letter shown on the next page. For additional information regarding the National Flood Insurance Program Community Rating System and Thurston County’s participation in the CRS Program, please contact: Pat Allen, Thurston County CRS Coordinator, (360) 867-2078.