

Mitigation Initiative Terms and Definitions

Cost

Cost ratings are defined as follows:

- **High**—Existing funding will not cover the cost of the project; implementation would require new revenue through an alternative source (for example, bonds, grants, and fee increases).
- **Medium**—The project could be implemented with existing funding but would require a re-apportionment of the budget or a budget amendment, or the cost of the project would have to be spread over multiple years.
- **Low**—The project could be funded under the existing budget. The project is part of or can be part of an ongoing existing program.

Benefit Rating

Benefit ratings are defined as follows:

- **High**—Project will provide an immediate reduction of risk exposure for life and property.
- **Medium**—Project will have a long-term impact on the reduction of risk exposure for life and property, or project will provide an immediate reduction in the risk exposure for property.
- **Low**—Long-term benefits of the project are difficult to quantify in the short term.

Timeline

The parameters for the timeline are as follows:

- **Short Term**—to be completed in 1 to 5 years
- **Long Term**—to be completed in greater than 5 years
- **Ongoing**—currently being funded and implemented under existing programs.

Priority

The priorities are defined as follows:

- **High Priority**—A project that meets multiple objectives, has benefits that exceed cost, has funding secured or is an ongoing project and meets eligibility requirements for a grant program. High priority projects can be completed in the short term (1 to 5 years). The key factors for high priority projects are that they have funding secured and can be completed in the short term.
- **Medium Priority**—A project that meets goals and objectives, that has benefits that exceed costs, and for which funding has not been secured but that is grant eligible. Project can be completed in the short term, once funding is secured. Medium priority projects will become high priority projects once funding is secured. The key factors for medium priority projects are that they are eligible for funding, but do not yet have funding secured, and they can be completed within the short term.
- **Low Priority**—A project that will mitigate the risk of a hazard, that has benefits that do not exceed the costs or are difficult to quantify, for which funding has not been secured, that is not eligible for FEMA grant funding, and for which the time line for completion is long term (1 to 10 years). Low priority projects may be eligible for grant funding from other programs. Low priority projects are “blue-sky” projects. How they will be financed is unknown, and they can be completed over a long term.

Tally of Initiatives supporting Flood Plan Goals and Objectives

1. Reduce the county’s vulnerabilities to flooding to protect people and essential facilities and to reduce property losses

2	a. Maintain a regionally coordinated emergency alert notification system that sends timely all-hazard warnings to affected populations
2	b. Identify and sign evacuation routes for areas of the county hardest hit by flooding and road closures
1	c. Train and equip emergency service providers to effectively respond to flood hazard events
1	d. Minimize the number of structures and infrastructure in hazard prone locations
1	e. Safeguard objects or places that have cultural or historical significance
3	f. Maintain and upgrade at risk transportation facilities, utilities, and other essential buildings and infrastructure to withstand the disruptive and damaging effects of flood hazards
2	g. Enforce ordinances and development regulations and prohibit development and other activities to prevent the creation of new flood hazards or shifting of existing flood hazards elsewhere
8 initiatives support Goal 1	

2. Commit resources to cost-effective flood management and hazard mitigation activities

1	a. Identify a team of county staff to manage and implement flood management and flood hazard reduction activities
4	b. Collect and analyze data, including data and information on the effects of climate change, to increase understanding of conditions that contribute to flood hazards, and examine strategies to minimize their impacts
5	c. Create a comprehensive flood mitigation strategy and pursue funding to manage and implement priority projects
3	d. Evaluate practical opportunities to leverage new public and private projects to afford protective measures to surrounding properties with pre-existing flood risks
4	e. Participate in the National Flood Insurance Program including its Community Rating System
7	f. Maintain up to date maps of floodways, floodplains, channel migration zones, and areas subject to high groundwater flooding
2	g. Participate in federal and state all-hazards workshops, programs, and exercises
5	h. Update the Flood Hazards Mitigation Plan and develop and maintain flood response and emergency action plans
14 initiatives support Goal 2	

3. Maintain essential county government services during emergencies

1	a. Identify, document, and train from lessons learned from previous events and exercises
1	b. Train existing county staff to provide additional backup functions for key staff who leave primary duties to provide flood response activities
1	c. Identify contingency funding measures for personnel working overtime during major hazard events
2 initiatives support Goal 3	

4. Restore, enhance, and protect the flood conveyance and ecological functions of channel migration zones, floodways, and floodplains

4	a. Retain the natural flood water conveyance functions of channel migration zones, floodways, and floodplains through compatible land uses
2	b. Avoid habitat degradation from any development or hazard mitigation activities in channel migration zones, floodways, and floodplains and fully mitigate habitat impacts where impacts are unavoidable
5	c. Prioritize flood mitigation projects that enhance habitat for aquatic species
5 initiatives support Goal 4	

5. Educate and inform residents and businesses to act to minimize their flood risks

2	a. Improve customer access to county flood information and to staff who are members of the flood management team
1	b. Make flood hazard maps accessible and user friendly, both online and in print at the Permit Assistance Center
3	c. Provide a variety of flood education materials to educate people about the risks of flooding and steps they can take to prevent losses
1	d. Assess needs and provide educational resources to accommodate flood disaster preparedness for special needs individuals or populations within the county
1	e. Inform residents to take precautions to become self-reliant for a minimum of 72 hours during a flood disaster
3 initiatives support Goal 5	

6. Bring the community together to make Thurston County resilient to flood hazards

2	a. Continue Thurston County participation on the Chehalis River Basin Flood Authority
3	b. Coordinate and provide leadership in the hazard mitigation planning process among local, tribal, state, and federal government partners
2	c. Train and plan for sheltering, evacuation needs, and coordination of volunteer assistance efforts with local, state, and federal emergency management partner agencies and non-government disaster relief organizations
3	d. Conduct broad outreach activities to engage all sectors of the community in the hazards mitigation planning process
5 initiatives support Goal 6	

Tally of Initiatives Supporting CRS Mitigation Categories

Prevention: 17

Property Protection: 2

Public Information: 5

Natural Resource Protection: 5

Emergency Services: 4

Structural Projects: 2

Draft Flood Mitigation Initiatives

ID	Title	Priority	Status	Cost	Benefit Rating	Timeline	Objectives	CRS Category
Emergency Planning, Notification, Evacuation, and Detour								
1	Dam Failure Evacuation Planning and Response	High	In progress	Medium	High	2017-2021, Short term	1a,1b,1c,6c	Emergency Services, Public Information
2	Flood Detours and Response Planning	High	In progress	Medium	Medium	2017 – 2021, Short term	1b,2h,5c	Emergency Services, Public Information
Infrastructure								
3	Culvert Replacement Flood Mitigation Program	High	Ongoing	High	High	2017 – 2030, Long term	1f,4a,4c	Prevention, Natural Resource Protection, Structural
4	Road Repair and Reconstruction Flood Mitigation Program	High	Ongoing	High	High	2017 – 2030, Long term	1f,4a,4c	Prevention, Natural Resource Protection
Mapping, Data, Protocols								
5	Flood Data Collection, Modeling, and Evaluation Program	High	Ongoing	Medium	Medium	2017-2030, Ongoing	1a, 2b	Prevention, Emergency Services
6	HAZUS – Flood Model Development and Maintenance Program	Medium	Ongoing	Medium	Low	2017-2021, Ongoing	2b,2g,2h	Prevention
7	Risk Map Land Use and Development Regulation Review and Revisions	High	In progress	Low	Medium	2017-2021	1g,2c,2f	Prevention
8	Flood Map Digitizing and Access	Medium	In Progress	Medium	Low	2017-2021	2f	Prevention
9	Flood Map and Data Storage and Retrieval Program	Medium	No Action	Low	Low	2017-2021	2b,2f,2h,3a	Prevention
10	River Channel Migration Zone and Habitat Mapping Program	Medium	Ongoing	Medium	Low	2017-2021, Short term, Ongoing	2f,4c,	Prevention
11	Building Inventory and Mapping Program	High	Ongoing	Medium	Low	2017-2021, Short term, Ongoing	2b,2e,2f	Prevention

ID	Title	Priority	Status	Cost	Benefit Rating	Timeline	Objectives	CRS Category
Flood Hazard Reduction								
12	Vulnerable Structures and Repetitive Loss Mitigation Program	High	Ongoing	High	High	2017-2030, Long term, Ongoing	1d,2c,2d,2e	Prevention, Property Protection
13	Debris and Sediment Inspection and Flood Hazard Reduction Program	Medium	New - No Progress	Medium	High	2017-2030, Long-term, Ongoing	1d,1e,1f,1g	Prevention, Property Protection, Natural Resource Protection, Emergency Services
Natural Functions and Ecosystem Services								
14	Floodplain Restoration and Reconnection	Medium	In Progress	High	Medium	2017-2030, Long-term, Ongoing	2d,4a,4b,4c	Prevention, Natural Resource Protection, Structural
15	Riparian Flood Control and Habitat Reforestation Project	Medium	New - No Progress	High	Medium	2017-2030, Long term	2d,4a,4b,4c	Prevention, Natural Resource Protection
Finance, Implementation, and Coordination								
16	Comprehensive Flood Program Finance Strategy	Medium	New - No Progress	Medium	Medium	2017-2021, Short term	2c,3b,3c	Prevention
17	County Flood Program Manager Appointment	High	New - No Progress	Medium	Medium	2017-2021	2a,2c,2e,2f,2g,2h,6a,6b,6c,6d	Prevention
18	Community Rating System Program	High	Ongoing	Low	Medium	Ongoing	2c,2e,2f,2h	Prevention, Public Information
19	Thurston Climate Adaptation Plan Evaluation and Plan Integration	Medium	Ongoing	Low	Low	Short term, Ongoing	6b	Public Information
Public Education and Awareness								
20	Flood Hazard Education and Hazard Reduction Public Outreach Strategy	Medium	New - No Progress	Low	Low	2018-2021, Short term	5a,5c,5e,6a,6b,6d	Prevention
21	Flood Website Development and Maintenance	High	No Action	Low	Low	2017-2019, Short term	5a,5b,5c,5d,6d	Public Information

ID Number: 1

Priority: High

Status: In progress

Initiative: Dam Failure Evacuation Planning and Response

Group: Emergency Planning, Notification, Evacuation, and Detour

CRS Category: Emergency Services, Public Information

Activity: Identify and sign evacuation routes and develop and train for evacuation procedures for communities downstream from the Nisqually, Yelm, and Skookumchuck hydroelectric project dams. Develop and implement a public outreach strategy to inform affected residents and businesses about routes and procedures.

Rationale: Washington State Department of Ecology identifies three high hazard dams in Thurston County that pose a major risk to downstream populations in the event of a catastrophic failure. Thurston County will coordinate with the dam operators and other stakeholders to identify evacuation routes and safe zones for people within the inundation areas. Procedures for securing the affected area and for allowing evacuees to return to their homes must be established.

Benefit Rating: High

Cost Estimate: Medium

Relates to Plan Goals and Objectives: 1a,1b,1c,6c

Timeline: 2017-2021, Short term

Leads: Emergency Services, Public Works, Sheriff's Office, Central Services – Geo Data

Funding Source: Grants, Local Funds

Origin of Initiative: FMI-23, 2012 Flood Plan

Progress and Implementation Status: Thurston County developed general recommendations for evacuation destinations for communities in the inundation zones, and continues to disseminate that information to residents. A notification plan has been established with TransAlta for the Skookumchuck River dam and work is being finalized on an evacuation plan for the Nisqually River.

ID Number: 2

Priority: High

Status: In progress

Initiative: Flood Detours and Response Planning

Group: Emergency Planning, Notification, Evacuation, and Detour

CRS Category: Emergency Services, Public Information

Activity: Identify detour routes for areas subject to frequent flood-related closures. Update emergency plans, create operational procedures, and provide public information and outreach resources to execute the detours when needed.

Rationale: There are 27 road segments within the county that are periodically closed due to flooding. A spatial database these locations was developed and will be evaluated to identify suitable routes to enable safe travel around areas subject to flooding.

Benefit Rating: Medium

Cost Estimate: Medium

Relates to Plan Goals and Objectives: 1b,2h,5c

Timeline: 2017 – 2021, Short term

Leads: Emergency Management, Public Works, Central Services – Geo Data

Funding Source: Grants, Local Funds

Origin of Initiative: FMI-25, 2012 Flood Plan

Progress and Implementation Status: Thurston County has reached an agreement with Weyerhaeuser Company providing a southeast flood detour route through Weyerhaeuser property during emergencies. Additional areas within the county need to be addressed.

ID Number: 3

Priority: High

Status: Ongoing

Initiative: Culvert Replacement Flood Mitigation Program

Group: Infrastructure

CRS Category: Prevention, Natural Resource Protection, Structural

Activity: Continue culvert replacement throughout the county for flood reduction, hazard avoidance, and to mitigate fish passage barriers. Replacement will occur as funds become available.

Rationale: Thurston County has numerous culverts that are inadequate or functionally obsolete for storm and surface water conditions which contribute to or compound flooding and fish passage barriers. The county has developed a comprehensive stormwater facilities database to prioritize culvert replacement with larger culverts or bridges to match project selection criteria from various grants and funding programs. New and replacement culverts should be designed to accommodate higher peak flows associated with more frequent and intense precipitation events and to enhance aquatic habitats.

Benefit Rating: High

Cost Estimate: High

Relates to Plan Goals and Objectives: 1f,4a,4c

Timeline: 2017 – 2030, Long term

Leads: Resource Stewardship, Public Works

Funding Source: Grants, Local Funds

Origin of Initiative: FMI-11, 2012 Flood Plan

Progress and Implementation Status: Thurston County has completed an inventory of all publicly maintained stormwater facilities and established an asset management system to track maintenance. Thurston County Storm and Surface Water Utility and Public Works coordinate to replace priority culverts for aquatic species and habitat protection and flood hazard reduction.

ID Number: 4

Priority: High

Status: Ongoing

Initiative: Road Repair and Reconstruction Flood Mitigation Program

Group: Infrastructure

CRS Category: Prevention, Natural Resource Protection

Activity: Prioritize the repair or replacement of roads and bridges that close during flood events. Upgrade these facilities as funds become available.

Rationale: The county has approximately 27 road segments that experience problems with flood impacts. Some roads are subject to damage from inundation and erosion. Road closures impact operations, cause traffic delays, delay emergency response times, and cause financial impacts to surrounding businesses.

Benefit Rating: High

Cost Estimate: High

Relates to Plan Goals and Objectives: 1f,4a,4c

Timeline: 2017 – 2030, Long term

Leads: Resource Stewardship, Public Works

Funding Source: Grants, Local Funds

Origin of Initiative: FMI-24, 2012 Flood Plan

Progress and Implementation Status: A spatial database of frequently flooded roads was developed for the entire county and all jurisdictions by Thurston Regional Planning Council. This data and the maps will be used to evaluate, prioritize, and program projects for construction.

ID Number: 5

Priority: High

Status: Ongoing

Initiative: Flood Data Collection, Modeling, and Evaluation Program

Group: Mapping, Data, Protocols

CRS Category: Prevention, Emergency Services

Activity: Expand Thurston County's flood prediction and forecast modeling capabilities for all types of flooding, including the impacts of climate change.

Rationale: Thurston County has a comprehensive surface and groundwater monitoring program and is expanding its number of monitoring stations and gauges. Maintaining and expanding investments in this program will support flood hazard identification, flood threat recognition and warning, risk assessment revisions, climate change adaptation strategies, land use evaluation, and hazard mitigation planning for all sources of flooding.

Benefit Rating: Medium

Cost Estimate: Medium

Relates to Plan Goals and Objectives: 1a,2b

Timeline: 2017-2030, Ongoing

Leads: Resource Stewardship, Emergency Management

Funding Source: Grants, Local Funds

Origin of Initiative: FMI-9, 2012 Flood Plan

Progress and Implementation Status: Hydrologic data from county monitoring locations are used to develop predictive models for stream flow, aquifer levels, and lake elevations. In the past year, Thurston County hired a new hydrogeologist and invested in additional groundwater and surface water modeling software capabilities. The County is also developing a comprehensive monitoring program data base that will make data analysis, accessibility, and presentation easier. Plans are being implemented to expand the environmental monitoring program to include additional stream and groundwater monitoring, and weather stations in strategic locations throughout the county to support better flood prediction and monitor high groundwater conditions. The County will also continue to evaluate flood prediction and forecast modeling opportunities and look for funding opportunities. Additional monitoring is necessary for high groundwater, lake, and riverine flooding and the effects of climate change on the frequency and severity of flooding throughout Thurston County.

ID Number: 6

Priority: Medium

Status: Ongoing

Initiative: HAZUS – Flood Model Development and Maintenance Program

Group: Mapping, Data, Protocols

CRS Category: Prevention

Activity: Maintain and operate an in-house GIS HAZUS-Flood model using local data to support flood planning activities.

Rationale: HAZUS flood scenario loss estimates will support hazard mitigation and response planning activities and can assist the county in evaluating its mitigation strategies.

Benefit Rating: Low

Cost Estimate: Medium

Relates to Plan Goals and Objectives: 2b,2g,2h

Timeline: 2017-2021, Ongoing

Leads: Emergency Services, Central Services – Geo Data

Funding Source: Grants, Local Funds

Origin of Initiative: FMI-14, 2012 Flood Plan

Progress and Implementation Status: Thurston County Emergency Management worked with FEMA under the RISK MAP program to update the building stock and critical facility data in the HAZUS-MH program. Depth grids were developed for the Marine Coast Areas and Deschutes Watershed in 2013/2014. Depth Grids for the Lower Chehalis and Nisqually are expected to be complete in Spring 2017 and Winter 2017 respectively. Department managers need to discuss how to assign, train, and support county personnel to sustain HAZUS model capabilities.

ID Number: 7

Priority: High

Status: In progress

Initiative: Risk Map Land Use and Development Regulation Review and Revisions

Group: Mapping, Data, Protocols

CRS Category: Prevention

Activity: Evaluate land use and development regulations accounting for changes to special flood hazard areas resulting from FEMA's Risk Map process and the county's flood studies. Consider appropriate watershed-specific revisions to zoning, development codes, and the Critical Areas Ordinance to refine flood hazard reduction strategies.

Rationale: The expansion or reduction of the 100-year floodplain will have implications for near-and long-term land use activities in Thurston County.

Benefit Rating: Medium

Cost Estimate: Low

Relates to Plan Goals and Objectives: 1g,2c,2f

Timeline: 2017-2021

Leads: Resource Stewardship

Funding Source: Local Funds

Origin of Initiative: New Initiative - Adapted from TC-FH-10, 2017 Hazards Mitigation Plan

Progress and Implementation Status: Several 100-year floodplains for Thurston County have not been updated. The Deschutes River floodplains have been remodeled and remapped and included in the Comprehensive Plan update in 2016 from the FEMA Risk Map process. The Marine Coastal floodplains and Lower Chehalis River, including the Skookumchuck and lower Black Rivers and Scatter Creek, are underway with the RISK Map program. The Nisqually River is scheduled to be updated in 2018. All floodplain revisions will be included in the Comprehensive Plan.

ID Number: 8

Priority: Medium

Status: In Progress

Initiative: Flood Map Digitizing and Access

Group: Mapping, Data, Protocols

CRS Category: Prevention

Activity: Update and maintain digital floodplain maps for all rivers, streams, lakes, high groundwater hazard areas, and flood of record areas. Make these maps available online.

Rationale: Thurston County amended its Floodplain Ordinance to require consideration of aerial photos that depict the extent of the "flood of record." The Critical Areas Ordinance relies on officially adopted floodplain map. After the aerial topography project is complete, Thurston County will develop new flood maps based on the new USGS protocol contained in "Updating Flood Inundation Maps Effectively," as amended or updated. Remapping will likely be performed in the following order: Nisqually, Deschutes, Skookumchuck, Chehalis, and Black River.

Benefit Rating: Low

Cost Estimate: Medium

Relates to Plan Goals and Objectives: 2f

Timeline: 2017-2021

Leads: FEMA, State Ecology, Resource Stewardship, Public Works, Central Services-GeoData Center, Storm and Surface Water Utility

Funding Source: Grants, Local Funds

Origin of Initiative: New Initiative - Adapted from TC-FH-7, 2017 Hazards Mitigation Plan

Progress and Implementation Status: Thurston County continues to work with the State Department of Ecology and FEMA Region 10 on the RISK Map program to remodel and remap floodplains in Thurston County. To date, the Deschutes River is complete. Final floodplain maps will be adopted in 2016. Preliminary maps were created for the marine coastal shoreline and are currently in review. The Lower Chehalis watershed is underway and completion is anticipated in late 2017 or early 2018. The Nisqually River project is expected to start in 2018. Thurston County captures high water elevation marks during flood events and manages development to the FEMA 100-year floodplain or the documented high water level plus two feet, or whichever is greater. Thurston County is also updating its high groundwater flooding map.

ID Number: 9

Priority: Medium

Status: No Action

Initiative: Flood Map and Data Storage and Retrieval Program

Group: Mapping, Data, Protocols

CRS Category: Prevention

Activity: Develop protocols to archive all flood maps and data sets so they can be reused later.

Rationale: Thurston County needs a system to maintain digital archives of all flood maps. A comprehensive flood data management system will support the evaluation of repetitive losses and other National Flood Insurance Program and Community Rating System needs.

Benefit Rating: Low

Cost Estimate: Low

Relates to Plan Goals and Objectives: 2b,2f,2h,3a

Timeline: 2017-2021

Leads: Emergency Services, Central Services - GeoData, local governments, and Thurston Regional Planning Council

Funding Source: Grants, Local Funds

Origin of Initiative: New Initiative - Adapted from TC-FH-9, 2017 Hazards Mitigation Plan

Progress 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 the 2017 Hazard Mitigation Plan. Thurston County documents high water marks from floods online at <http://www.co.thurston.wa.us/permitting/flood/flood-photos.html>.

ID Number: 10

Priority: Medium

Status: Ongoing

Initiative: River Channel Migration Zone and Habitat Mapping Program

Group: Mapping, Data, Protocols

CRS Category: Prevention

Activity: Maintain up to date maps for the channel migration zones for all rivers in the region and the extent of high quality riparian habitat.

Rationale: Mapping the channel migration zones, potential hazardous features, natural features, and riparian habitat provides a useful database for evaluating hazard reduction and habitat restoration projects.

Benefit Rating: Low

Cost Estimate: Medium

Relates to Plan Goals and Objectives: 2f,4c

Timeline: 2017-2021, Short term, Ongoing

Leads: Resource Stewardship, Central Services – Geo Data, Public Works, Storm and Surface Water Utility

Funding Source: Local funds

Origin of Initiative: FMI-26

Progress and Implementation Status: High quality riparian habitat data has been compiled for the Henderson Inlet, Deschutes, Totten/Eld Inlet, and the Nisqually River basins. Channel migration mapping has been conducted and refinement of the mapping is ongoing. 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.

ID Number: 11

Priority: High

Status: Ongoing

Initiative: Building Inventory and Mapping Program

Group: Mapping, Data, Protocols

CRS Category: Prevention

Activity: Update and maintain the Thurston County building footprint database to account for all existing structures such as homes, commercial buildings, barns, and other structures of value.

Rationale: A reliable and accurate database of all building structures in the county is necessary for conducting a thorough risk assessment, developing a mitigation strategy, public outreach, and other planning needs. The existing building footprint database is incomplete and is updated sporadically. This initiative will commit resources to complete, update, and maintain this useful data on a regular schedule.

Benefit Rating: Low

Cost Estimate: Medium

Relates to Plan Goals and Objectives: 2b,2e,2f

Timeline: 2017-2021, Short term, Ongoing

Leads: Thurston County Assessors Office, Central Services - Thurston GeoData

Funding Source: Grants and Local Funds

Origin of Initiative: New Initiative, 2017 Flood Plan Update

Progress and Implementation Status: This initiative was introduced in the 2017 Flood Plan update. There is no progress to report.

ID Number: 12

Priority: High

Status: Ongoing

Initiative: Vulnerable Structures and Repetitive Loss Mitigation Program

Group: Flood Hazard Reduction

CRS Category: Prevention, Property Protection

Activity: Formalize a program to evaluate repetitive flood claim loss properties and other structures subject to repetitive flooding as candidate projects for elevation, relocation or buyout. Develop project cost estimates and a finance strategy for priority projects and evaluate a long-term implementation plan. Develop processes to partner with candidate property owners to inform them about the program's opportunities and benefits. Implement projects as funds become available.

Rationale: Thurston County has successfully pursued opportunities to mitigate properties subject to frequent flooding, but a more deliberate and concerted effort is necessary to track and monitor grant opportunities and project delivery to account for personnel changes and department restructuring.

Benefit Rating: High

Cost Estimate: High

Relates to Plan Goals and Objectives: 1d,2c,2d,2e

Timeline: 2017-2030, Long term, Ongoing

Leads: Resource Stewardship, Central Services, Emergency Services, Storm and Surface Water Utility

Funding Source: Grants, Local Funds

Origin of Initiative: FMI-1

Progress and Implementation Status: County staff has compiled a list of properties that are potential candidates for elevation, relocation, or buyout. This list includes repetitive loss properties and other properties that have been identified through past inspections, post-flooding evaluations, and individual inquiries. In 2016, a grant request was made through the Chehalis flood Authority to elevate 12 houses and buyout 8 properties. Additionally a study was completed through the Chehalis Flood Authority for the Chehalis and Skookumchuck River basins that identified 300 lots for future buyout or elevation. As additional funding is identified efforts will continue to mitigate at risk properties. New properties will be added to the list as additional information becomes available.

ID Number: 13

Priority: Medium

Status: New - No
Progress

Initiative: Debris and Sediment Inspection and Flood Hazard Reduction Program

Group: Flood Hazard Reduction

CRS Category: Prevention, Property Protection, Natural Resource Protection, Emergency Services

Activity: Develop and implement a program to periodically inspect floodways and channel migration zones to monitor and document debris and sediment accumulation and to detect and respond to potential flood hazards, especially in areas that experience recurring flood problems.

Rationale: Accumulation of debris results in flood impacts to public and private property. Periodic inspections and coordination with property owners may identify and respond to potential flood risks before they threaten property or public safety.

Benefit Rating: High

Cost Estimate: Medium

Relates to Plan Goals and Objectives: 1d,1e,1f,1g

Timeline: 2017-2030, Long-term, Ongoing

Leads: Public Works, Resource Stewardship, Emergency Services

Funding Source: Local Funds

Origin of Initiative: New Initiative, 2017 Flood Plan Update

Progress and Implementation Status: This initiative was introduced in the 2017 Flood Plan update. There is no progress to report.

ID Number: 14

Priority: Medium

Status: In Progress

Initiative: Floodplain Restoration and Reconnection

Group: Natural Functions and Ecosystem Services

CRS Category: Prevention, Natural Resource Protection, Structural

Activity: Protect and connect aquatic habitat and flood ecosystem services through a variety of flood plain management activities to comply with the National Marine Fisheries Service Biological Opinion regarding the National Flood Insurance Program: 1. Research best practices with large woody debris management and other bioengineering methods to stabilize streambanks, improve channel conditions, and to enhance fish and wildlife habitat; 2. Revise shoreline regulations, as appropriate, to permit bioengineering methods; 3. Commit flood-buyout-properties to open space.

Rationale: Flooding is a natural process and restoring flood storage capacity in floodplains can benefit farmlands and aquatic species habitat.

Benefit Rating: Medium

Cost Estimate: High

Relates to Plan Goals and Objectives: 2d,4a,4b,4c

Timeline: 2017-2030, Long-term, Ongoing

Leads: Resource Stewardship, Public Works, Storm and Surface Water Utility, Thurston Conservation District

Funding Source: Grants, Local Funds

Origin of Initiative: FMI-3, Modified to merge with activities from FMI 18, FMI-20, FMI-28, FMI-31, 2012 Flood Plan and from TC-FH-11 and TC-FH-18, 2017 Hazards Mitigation Plan

Progress and Implementation Status: The Shoreline Master Program and Critical Areas Ordinance includes preferences for bioengineering and other natural protection measures when activities are approved. Letters of support have been sent to local lead entities for salmon recovery and other organizations engaged in such work. Woody debris management and maintenance is addressed in the Thurston County Shoreline Master Plan and Critical Areas Ordinance. The County adopted a Critical Areas Ordinance in 2013 and is working to update its Shoreline Master Plan in 2017.

ID Number: 15

Priority: Medium

Status: New - No
Progress

Initiative: Riparian Flood Control and Habitat Reforestation Project

Group: Natural Functions and Ecosystem Services

CRS Category: Prevention, Natural Resource Protection

Activity: Formalize a program with landowners and other stakeholders to reforest corridors along river and stream shorelines where they can provide flood protection benefits and enhance riparian habitat.

Rationale: Reestablishing a forested edge along river and stream shorelines is an important long-term project to restore floodplain functions and enhance riparian habitat. The success of the program will rely on public and private partnerships to overcome the challenges of land access, voluntary agreements, and funding.

Benefit Rating: Medium

Cost Estimate: High

Relates to Plan Goals and Objectives: 2d,4a,4b,4c

Timeline: 2017-2030, Long term

Leads: Resource Stewardship, Public Works, Thurston Conservation District

Funding Source: Grants, Local Funds, Partnerships

Origin of Initiative: New Initiative - Adapted from TC-FH-17, 2017 Hazards Mitigation Plan

Progress 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 WRIsAs, \$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.

ID Number: 16

Priority: Medium

Status: New - No
Progress

Initiative: Comprehensive Flood Program Finance Strategy

Group: Finance, Implementation, and Coordination

CRS Category: Prevention

Activity: Pursue a coordinated interdepartmental approach to evaluate and implement a finance strategy for the county's flood management programs and projects.

Rationale: Flood program activities are spread across several county departments and are managed by a handful of experienced staff. Current departmental budgets and staff structuring limit the county's ability to achieve its flood plan goals and objectives. Department directors and key staff should evaluate funding options to leverage department budgets to satisfy both the requirements of the National Flood Insurance Program's Community Rating System and the priority activities identified in this plan's mitigation strategy.

Benefit Rating: Medium

Cost Estimate: Medium

Relates to Plan Goals and Objectives: 2c,3b,3c

Timeline: 2017-2021, Short term

Leads: Thurston County Manager, Department and Division Directors, Resource Stewardship, Emergency Services, Public Works, Storm and Surface Water Utility, Board of County Commissioners

Funding Source: Local funds

Origin of Initiative: New Initiative - Adapted from FMI-7 and FMI-17, 2012 Flood Plan

Progress and Implementation Status: This initiative was introduced in the 2017 Flood Plan update. There is no progress to report.

ID Number: 17

Priority: High

Status: New - No
Progress

Initiative: County Flood Program Manager Appointment

Group: Finance, Implementation, and Coordination

CRS Category: Prevention

Activity: Establish a new county staff position to manage and coordinate all the interdepartmental flood program activities including implementation of the Flood Hazard Mitigation Plan and participation in the National Flood Insurance Program and its Community Rating System.

Rationale: Thurston County's various flood program activities are spread across Emergency Services, Resource Stewardship, the Storm and Surface Water Utility, and Public Works. Many activities have federal oversight, are complex, related, and require greater attention. This proposed position will be responsible for managing all of the county's flood management program activities, including its participation in the National Flood Insurance Program and Community Rating System.

Benefit Rating: Medium

Cost Estimate: Medium

Relates to Plan Goals and Objectives: 2a,2c,2e,2f,2g,2h,6a,6b,6c,6d

Timeline: 2017-2021

Leads: Thurston County Manager, Department Directors

Funding Source: Local funds

Origin of Initiative: New Initiative, 2017 Flood Plan Update

Progress and Implementation Status: This initiative was introduced in the 2017 Flood Plan update. There is no progress to report.

ID Number: 18

Priority: High

Status: Ongoing

Initiative: Community Rating System Program

Group: Finance, Implementation, and Coordination

CRS Category: Prevention, Public Information

Activity: Strive to maintain a Class 5 or better Community Rating System (CRS) classification as a means of reducing flood risks.

Rationale: The CRS Program specifies a wide range of comprehensive floodplain management activities that reduce flood hazards and protect natural floodplain functions. This credit-based program awards a 1 (highest) through 10 (lowest) rating to communities based on their demonstrated level of effort. In 2016, Thurston County received a Class 2 rating. As a result, flood insurance policy holders in the 100-year floodplain are entitled to a 40% discount on their insurance premium.

Benefit Rating: Medium

Cost Estimate: Low

Relates to Plan Goals and Objectives: 2c,2e,2f,2h

Timeline: Ongoing

Leads: Resource Stewardship, Storm and Surface Water Utility, Emergency Services, Public Works

Funding Source: Local funds

Origin of Initiative: FMI-5

Progress and Implementation Status: Thurston County enrolled in the CRS Program in 2000. It initially received a Class 5 rating. The county became a Class 2 community in October 2016. The next verification site visit is scheduled for 2018. The 2017 Flood Plan Update is a prerequisite for maintaining a Class 5 or better rating.

ID Number: 19

Priority: Medium

Status: New - No
Progress

Initiative: Thurston Climate Adaptation Plan Evaluation and Plan Integration

Group: Finance, Implementation, and Coordination

CRS Category: Prevention

Activity: Evaluate the priority flood hazard adaptation actions from the Thurston Climate Adaptation Plan and incorporate them into the Flood Hazards Mitigation Plan and other appropriate county plans.

Rationale: Climate change is projected to alter Western Washington's hydrological cycle. Future winters will be warmer and wetter, resulting in more frequent and intense precipitation events. This will cause more frequent stream/river and high groundwater flooding. Sea level rise will contribute to more extended and deeper coastal flooding. Thurston County will need to take steps to adapt to changing conditions and mitigate climate induced flood hazards.

Benefit Rating: Low

Cost Estimate: Low

Relates to Plan Goals and Objectives: 6b

Timeline: 2018-2021, Short-term

Leads: Resource Stewardship, Storm and Surface Water Utility, Emergency Services, Public Works, and other jurisdictions and stakeholders

Funding Source: Local funds

Origin of Initiative: New Initiative, 2017 Flood Plan Update

Progress and Implementation Status: Thurston County is a partner to a multi-stakeholder planning process to develop a Climate Adaptation Plan for the Thurston Region. Slated for adoption by Thurston Regional Planning Council in early 2018, this plan will present a range of actions for the county and other communities to implement to offset risks and achieve long-term community goals for both the built and natural environments. Following adoption, the actions will be evaluated and incorporated into relevant plans, where appropriate.

ID Number: 20

Priority: Medium

Status: Ongoing

Initiative: Flood Hazard Education and Hazard Reduction Public Outreach Strategy

Group: Public Education and Awareness

CRS Category: Public Information

Activity: Continue to develop and implement an annual public outreach campaign to maintain flood risk awareness and improve peoples' understanding of resources and capabilities within the county. This include activities directed at both broad audiences and direct contact with property owners within flood hazard areas.

Rationale: Ongoing public outreach and education for flood hazard mitigation activities is necessary to engage and inform all sectors of the community to become more disaster resilient. Messaging will focus on opportunities for households, businesses, and employers to minimize losses from flood hazards that threaten the county.

Benefit Rating: Low

Cost Estimate: Low

Relates to Plan Goals and Objectives: 5a,5c,5e,6a,6b,6d

Timeline: Short term, Ongoing

Leads: Resource Stewardship, Storm and Surface Water Utility, Emergency Services, Public Works, Central Services

Funding Source: Grants, Local funds

Origin of Initiative: FMI-2

Progress and Implementation Status: The County continues to disseminate flood risk information: through the website; targeted mailings to realtors, lenders, and insurance agencies; mailing the annual Flood Bulletin Newsletter to properties in flood hazard areas; notifications to repetitive loss properties; press releases to local media; and personal interaction through technical visits, phone calls, permit counter inquiries and during the permit application and/or review process. The annual Emergency Preparedness Expo and the Risk Map process provide additional opportunities for community engagement with county staff, and other public and private partners.

ID Number: 21

Priority: High

Status: No Action

Initiative: Flood Website Development and Maintenance

Group: Public Education and Awareness

CRS Category: Public Information

Activity: Revise Thurston County's website to consolidate all flood-related information and contents to improve accessibility. Expand the use of interactive tools such as GIS story maps with flood data and other relevant information.

Rationale: Flood information on the county's website is spread across several departments and is not effectively cross-linked, making it confusing and difficult to access. This initiative will consolidate all flood related information to a single centralized website and provide cross-reference links to other department webpages where appropriate.

Benefit Rating: Low

Cost Estimate: Low

Relates to Plan Goals and Objectives: 5a,5b,5c,5d,6d

Timeline: 2017-2019, Short term

Leads: Resource Stewardship, Storm and Surface Water Utility, Emergency Services, Public Works, Central Services

Funding Source: Grants, Local funds

Origin of Initiative: New Initiative - Adapted from FMI-19, 2012 Flood Plan

Progress and Implementation Status: This initiative was introduced in the 2017 Flood Plan update. There is no progress to report.

2012 Flood Mitigation Initiatives, Completed or Removed

ID	Initiative	Evaluation	Priority	Status	CRS Category
FMI-3	Continue a conservative approach to woody debris management and maintenance, using state- or County-established best management practices.	This activity is replaced by Initiative 14.	High	Removed	Natural Resource Protection
FMI-4	Continue to maintain compliance and good standing with the programmatic requirements of the National Flood Insurance Program.	This activity is replaced by Initiative 14.	High	Removed	Prevention, Property Protection, Public Education and Awareness
FMI-10	Complete an inventory of all publicly maintained stormwater facilities.	This task was completed and is continued by Initiative 3.	High	Completed	Prevention
FMI-12	Utilizing the best available data, science and technology, enhance the existing flood notification program, striving to identify a notification protocol within systems that have real-time flood threat recognition capability.	The implementation of the Thurston County Alert Sense Notification System in 2016 fulfilled this task and is continued by Initiatives 1 and 2.	High	Completed	Prevention
FMI-20	Continue to pursue/ maintain Thurston County floodplain management program compliance with the National Marine Fisheries Service biological opinion regarding the National Flood Insurance Program.	This initiative is replaced by Initiative 14.	High	Removed	Natural Resource Protection
FMI-21	Establish a link between the Thurston County Flood Hazard Mitigation Plan and the Natural Hazards Mitigation Plan for the Thurston Region. The Flood Hazard Mitigation Plan will become the flood hazard	The Hazards Mitigation Plan for the Thurston Region was adopted by Thurston County in July 2017 and recommendations from this plan were considered for this flood plan update.	High	Completed	Emergency Services

ID	Initiative	Evaluation	Priority	Status	CRS Category
	component of the Natural Hazards Mitigation Plan upon its next update. All future updates to the two plans will occur on the same planning cycle upon plan integration.	This task is no longer necessary.			
FMI-22	Obtain digital data and create GIS maps of the flood inundation from possible failures of the Skookumchuck Dam on the Skookumchuck River and the Alder and LaGrande Dams on the Nisqually River. Using this data, assess the risk associated with these facilities utilizing the best available data and science.	The “Dam Break Analysis and Inundation Mapping for the Skookumchuck Dam” was updated using digital topographic data provided by Thurston County in 2013. Tacoma Power updated their dam failure report for Alder Dam on the Nisqually River in 2014. Thurston County has obtained the GIS data for both watersheds. This initiative is complete and related emergency planning activities are continued in Initiative 1.	High	Completed	Prevention
FMI-27	FMI-27—To support initiative # FMI-1, undertake a study of identified repetitive flood loss areas to determine the following: 1 Repetitive losses not captured by flood insurance data; 2 Causes of the repetitive flooding; 3 Assets impacted by the repetitive flooding (this would include assets such as livestock, out-buildings and rescue costs not already identified by FEMA); and 4 Possible alternatives to remediate the repetitive flooding	A repetitive loss analysis was completed in 2015. This activity is replaced by Initiative 12.	Medium	Completed	Prevention
FMI-28	Revise shoreline regulations to encourage shoreline protective structures to be bioengineered.	This activity is replaced by Initiative 14.	High	Removed	Prevention, Natural Resource Protection

ID	Initiative	Evaluation	Priority	Status	CRS Category
FMI-29	Review the recommendations of adopted stormwater drainage basin plans to determine which ones are still relevant for implementation.	This activity is completed and is continued by activities in Initiative 14.	High	Removed	Prevention
FMI-30	Prepare new drainage basin plans for the high groundwater areas.	This task is no longer relevant.	High	Removed	Prevention
FMI-31	To support implementation of the Thurston County Critical Areas Ordinance, encourage research that establishes best management practices for bioengineering and other techniques that provide streambank protection and improve fisheries through the use of large woody debris. Support local demonstration projects that could support such research.	This activity is replaced by Initiative 14	Medium	Removed	Natural Resource Protection
FMI-32	Where feasible, consider the adoption of appropriate higher regulatory standards (including but not limited to freeboard, comp storage, lower substantial damage thresholds, setbacks and fill restrictions) as means to reduce future flood risk and support a no-adverse-impact philosophy of floodplain management.	Thurston County has adopted higher regulatory standards for freeboard, storage, damage thresholds, setbacks, and fill as outlined in the Critical Areas Ordinance and Thurston County Code. This activity is complete. Additional code changes will be evaluated in Initiative 7.	Medium	Completed	Prevention