

Thurston County Flood Hazard Mitigation Plan



THURSTON COUNTY
WASHINGTON
SINCE 1852

OCTOBER 2017

Prepared by Thurston Regional Planning Council

Board of Thurston County Commissioners

NAME	DISTRICT
John Hutchings, Vice-Chair	District 1
Gary Edwards	District 2
Bud Blake, Chair	District 3

Flood Planning Committee

NAME	ROLE/TITLE	AFFILIATION
Community Representatives		
Scott Boettcher	Stakeholder	Staff, Chehalis River Basin Flood Authority
Cal Bray	Stakeholder	Emergency Manager, Confederated Tribes of the Chehalis Reservation
Tris Carlson	Community Representative	NE Thurston County Coastal Floodplain Resident, Shellfish Grower
Howard Glasstetter	Community Representative	Nisqually Valley Floodplain Resident
Robert Scott	Stakeholder	Fire Chief, West Thurston Regional Fire Authority
Alan Vanell	Community Representative	Council Member, Town of Bucoda and Representative to the Chehalis River Basin Flood Authority
George Walter	Stakeholder	Environmental Program Supervisor, Nisqually Indian Tribe
Thurston County Staff Representatives		
Andrew Kinney	Emergency Management Coordinator	Emergency Services
Mark Maurer	Stormwater and Water Resources Utility Planner	Water Resources, Stormwater Utility
Allison Osterberg	Senior Planner	Resource Stewardship
Meghan Porter	Public Information Officer	Board of County Commissioners
Tim Rubert	Plans Examiner, Floodplain Manager	Resource Stewardship
Trevin Taylor	Senior Environmental Coordinator	Public Works
Project Leads/Facilitators		
Pat Allen	Senior Civil Engineer, CRS Coordinator	Thurston County Water Resources, Stormwater Utility
Paul Brewster	Senior Planner, Project Lead	Thurston Regional Planning Council

Flood Development Team

MEMBER	DEPARTMENT	TITLE
Thurston County PDT Members		
Pat Allen, Thurston County Project Lead, CRS Coordinator	Stormwater Utility	Senior Civil Engineer
Andrew Kinney	Emergency Services	Emergency Management Coordinator
Mark Maurer	Water Resources	Stormwater and Water Resources Utility Planner
Allison Osterberg	Resource Stewardship	Senior Planner
Tim Rupert	Resource Stewardship	Plans Examiner, Floodplain Manager
Trevin Taylor	Public Works	Senior Environmental Coordinator
Thurston Regional Planning Council PDT Members		
Michael Ambrogi	TRPC	Senior GIS Analyst
Paul Brewster, Project Lead/Planner	TRPC	Senior Planner
Jared Burbidge	TRPC	Deputy Director
Erin Cahill	TRPC	Communications and Outreach Specialist II
Scott Carte	TRPC	GIS Coordinator
Holly Gilbert	TRPC	Senior Planner
Burlina Montgomery	TRPC	Communications and Outreach Specialist I
Karen Parkhurst	TRPC	Director of Policies and Programs
Sarah Selstrom	TRPC	Administrative Assistant
Veena Tabbutt	TRPC	Director of Data and Research
Steve Xu	TRPC	Planning Technician

RESOLUTION No. 15521

A RESOLUTION approving and adopting the 2017 Update to the Thurston County Flood Hazard Mitigation Plan.

WHEREAS, Thurston County participates in the National Flood Insurance Program; and

WHEREAS, Thurston County participates in the Nation Flood Insurance Program's Community Rating System (CRS); and

WHEREAS, Thurston County currently is rated as a Class 2 community in the CRS program, which results in a 40% reduction in flood insurance premiums for property owners located in the County's floodplains; and

WHEREAS, Thurston County must update its Flood Hazard Mitigation Plan every five years and meet certain planning requirements of the CRS program in order to meet the prerequisites to be a Class 4 or better community; and

WHEREAS, the updated Flood Hazard Mitigation Plan meets the CRS program's prerequisites for a rating of Class 4 or better in the Community Rating System; and

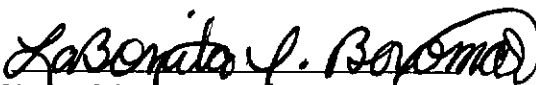
WHEREAS, the updated Flood Hazard Mitigation Plan recommends mitigation activities that are intended to reduce private and public property damages due to future floods; and

WHEREAS, the Board of County Commissioners has been briefed on the contents and has had an opportunity to review the Flood Hazard Mitigation Plan, and finds that it is in the best interest of Thurston County to adopt the Plan;


NOW, THEREFORE, BE IT RESOLVED that the Board of County Commissioners hereby approves and adopts the 2017 Flood Hazard Mitigation Plan as shown in attachment A.

ADOPTED: October 3, 2017

ATTEST:

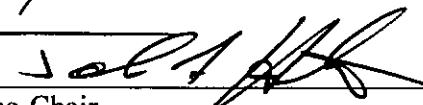

Clerk of the Board


BOARD OF COUNTY COMMISSIONERS
Thurston County, Washington

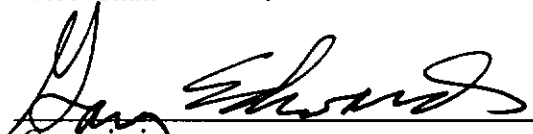

Chair

APPROVED AS TO FORM:

JON TUNHEIM
PROSECUTING ATTORNEY


Vice-Chair


Travis Burns
Deputy Prosecuting Attorney


Commissioner

This page left blank intentionally.

TABLE OF CONTENTS

- EXECUTIVE SUMMARY 1**
- The Problem 1
- The Solution 1
- Community Rating System Benefits 2
- Plan Development Methodology 3
 - Phase 1: Planning Process 3
 - Phase 2: Risk Assessment 3
 - Phase 3: Mitigation Strategy 4
 - Phase 4: Plan Maintenance 4
- Plan Goals and Objectives 5
- Mitigation Initiatives 8
- Implementation 10
- CHAPTER 1 INTRODUCTION 1-1**
- 1.0 Flooding will Persist, but Disasters and Hazards
 can be Avoided 1-1
- 1.1 Flood Hazards in the Pacific Northwest 1-3
- 1.2 Flood Mitigation Programs 1-4
- 1.3 Community Rating System (CRS) Participation Benefits 1-5
- 1.4 Community Rating System Steps for Comprehensive
 Floodplain Management Planning 1-7
- 1.5 Plan Organization 1-7
- CHAPTER 2 FLOOD RISK ASSESSMENT 2-1**
- 2.1 Introduction 2-1
 - 2.1.1 Federal Disaster Declarations 2-2
 - 2.1.2 Risk Assessment Definitions 2-4
- 2.2 Hazard Identification 2-6
 - 2.2.1 Riverine Flooding 2-6
 - 2.2.2 Groundwater Flooding 2-31
 - 2.2.3 Tidal Flooding 2-37
 - 2.2.4 Urban Flooding 2-38

2.2.5 Lake Flooding	2-40
2.2.6 Dam Failure	2-43
2.3 Effects of Climate Change.....	2-45
2.3.1 Hydrology	2-46
2.3.2 Sea Level Rise	2-48
2.4 Flood Historical Occurrences and Impacts	2-50
2.5 Flood Hazard Exposure Analysis	2-56
2.5.1 HAZUS Estimates of Flood Losses	2-56
2.5.2 GIS Hazard Exposure Analysis	2-60
2.5.3 Other Hazard Assessments	2-72
2.6 National Flood Insurance Claims	2-77
2.7 Repetitive Loss Properties	2-79
2.7.1 Repetitive Loss Area Analysis	2-80
2.7.2 RLA Communication and Mitigation Information	2-84
2.7.3 Conclusion	2-85
2.7.4 Repetitive Loss Areas Recommendations.....	2-86
2.7.5 Current and Future Repetitive Loss Area Analysis.....	2-87
2.8 Flood Impacts on the Environment.....	2-89
2.9 Food Risk Assessment Summary	2-92
2.10 References.....	2-93

CHAPTER 3 MITIGATION STRATEGY: GOALS, OBJECTIVES, AND INITIATIVES..... 3-1

3.0 Introduction	3-1
3.1 Goals and Objectives	3-2
3.1.1 Revisions to Goals and Objectives	3-5
3.2 Mitigation Initiatives	3-6
3.2.1 Mitigation Categories.....	3-7
3.2.2 Mitigation Initiative Implementation Details	3-9
3.3 Thurston County Flood Mitigation Initiatives – Current Adopted.....	3-12
3.3.1 Mitigation Initiative Details.....	3-15
3.3.2 Mitigation Initiatives - Completed and Removed	3-35
3.3.3 Identification and Preparation of Mitigation Initiatives....	3-40
3.4 Regulatory Activities.....	3-44
3.4.1 Thurston County Comprehensive Plan	3-44

- 3.4.2 Building and Construction Code 3-47
- 3.4.3 Critical Areas Ordinance – Frequently Flooded Areas
and Wetlands Protection 3-49
- 3.4.4 Zoning and other Thurston County Codes 3-52
- 3.4.5 Stormwater Regulations 3-54
- 3.5 Property Protection Assistance Activities 3-55
- 3.6 Emergency Services Activities 3-57
- 3.7 Structural Projects 3-58
- 3.8 Public Information and Outreach Activities 3-60

CHAPTER 4 PLAN PROCESS AND DEVELOPMENT ... 4-1

- 4.0 Introduction 4-1
 - 4.0.1 Planning Process Overview 4-1
 - 4.0.2 Plan Funding 4-2
 - 4.0.3 The Planning Area 4-3
- 4.1 Guiding Principles 4-5
- 4.2 The Flood Planning Committee (FPC) 4-7
 - 4.2.1 FPC Meetings 4-8
- 4.3 The Plan Development Team (PDT) 4-9
- 4.4 Coordination with Planning Partners 4-13
 - 4.4.1 Partner Contacts and Notifications 4-13
 - 4.4.2 Partner Follow-up Activities 4-13
- 4.5 Public Involvement 4-16
 - 4.5.1 Project Website and Social Media 4-17
 - 4.5.2 Post Cards 4-19
 - 4.5.3 Hazard Story Maps 4-19
 - 4.5.4 Thurston County Flood Hazards Community Survey 4-21
- 4.6 Public Meetings 4-28
- 4.7 Final Draft Plan Public Review and Comments 4-30
- 4.8 Thurston County Board of County Commissioners
Plan Review and Adoption Activities 4-31

CHAPTER 5 PLAN IMPLEMENTATION AND MAINTENANCE 5-1

- 5.0 Keeping the Plan Current 5-1
- 5.1 Plan Implementation 5-3
- 5.2 Flood Planning Committee (FPC) 5-3

5.3 Annual Progress Report	5-4
5.4 Plan Revisions	5-5
5.5 Plan Update.....	5-5
5.5.1 Update Schedule.....	5-7
5.6 Continuing Public Involvement	5-8
5.7 Incorporation into Other Planning Mechanisms	5-8
CHAPTER 6 COMMUNITY PROFILE	6-1
6.0 Introduction.....	6-1
6.1 Community Profile	6-2
6.1.1 Geography.....	6-2
6.1.2 Climate.....	6-4
6.1.3 Population and Demographics	6-6
6.1.4 Housing.....	6-7
6.1.5 Development Trends	6-7
6.1.6 Economy	6-9
6.1.7 Special Districts.....	6-9
6.1.8 Transportation Network and Utilities.....	6-10
6.1.9 Essential Facilities.....	6-10
CHAPTER 7 CAPABILITY ASSESSMENT.....	7-1
7.1 Federal.....	7-1
7.1.1 Disaster Mitigation Act of 2000	7-1
7.1.2 FEMA Flood Mapping and Risk MAP.....	7-2
7.1.3 National Flood Insurance Program.....	7-3
7.1.4 The Community Rating System (CRS)	7-4
7.1.5 Endangered Species Act	7-5
7.1.6 The Clean Water Act	7-8
7.2 State.....	7-8
7.2.1 Washington State Enhanced Hazard Mitigation Plan.....	7-8
7.2.2 Washington State Floodplain Management Law.....	7-8
7.2.3 Flood Control Assistance Account Program	7-9
7.2.4 Shoreline Management Act.....	7-10
7.2.5 Growth Management Act.....	7-11
7.2.6 Washington State Building Code	7-11
7.2.7 Comprehensive Emergency Management Planning	7-11
7.2.8 Watershed Management Act.....	7-13

- 7.2.9 State Environmental Policy Act 7-13
- 7.3 Local 7-14
 - 7.3.1 Comprehensive Plans 7-14
 - 7.3.2 Emergency Management Plan 7-15
 - 7.3.3 Critical Areas Ordinance..... 7-15
 - 7.3.4 Municipal Stormwater Permits 7-15
 - 7.3.5 Shoreline Master Program 7-16
 - 7.3.6 WRIA Planning..... 7-17
 - 7.3.7 School District Bonds 7-18
- 7.4 Regional Planning 7-18
 - 7.4.1 The Emergency Management Council
of Thurston County 7-18
 - 7.4.2 Thurston Regional Planning Council 7-19
- 7.5 Local Flood Plans and Studies Review 7-23
- APPENDIX A GLOSSARY..... A-1**
- APPENDIX B COMMUNITY RATING SYSTEM (CRS)
PLANNING REQUIREMENTS B-1**
- APPENDIX C PUBLIC OUTREACH INFORMATION... C-1**
- APPENDIX D FLOOD HAZARDS MITIGATION PLAN
ANNUAL PROGRESS REPORT TEMPLATE D-1**

This page left blank intentionally.

EXECUTIVE SUMMARY

The Problem

Flooding in Thurston County is common, and on an annual average basis is the costliest natural hazard that afflicts residents, businesses, and the county government. Between 1962 and 2016, Thurston County has received 16 federal disaster declarations related in some part to flooding. Total countywide flood damage estimates over this period exceed \$206 million.¹ The February 1996 flood cost uninsured private property owners in Thurston County losses exceeding \$22 million. Statewide, the Federal Emergency Management Agency (FEMA) provided over \$72 million in aid to flood victims, businesses, and local governments for the December 2007 floods and over \$12.8 million in assistance for the January 2009 floods. Minor flood events occur annually in Thurston County.

The Solution

Of the four stages of the disaster management cycle – mitigation, preparedness, response, and recovery – only mitigation directly eliminates losses. The other stages all occur in reaction to or anticipation of impacts from flood disaster events. Hazard mitigation planning identifies and prioritizes sustained measures that, if enacted, will reduce or eliminate long-term risk to people and property. In the long term, mitigation measures reduce personal loss, save lives, and reduce the cost to local, state, and federal governments for responding to and recovering from recurrent or unusual flood events.

A mitigation strategy involves activities such as planning, policy changes, building codes, development regulations, land use zoning, programs, projects, and other actions that can eliminate or reduce the impacts of flood hazards within Thurston County. The responsibility for

¹ Hazards & Vulnerability Research Institute. 2016. The Spatial Hazard Events and Losses Database for the United States, Version 15.2 [SHELDUS Online Database]. Columbia, SC: University of South Carolina.

hazard mitigation lies with many, including private property owners, business, industry, and local, state, and federal government. Recognizing that no one solution can mitigate flood hazards, planning provides a mechanism to identify the best alternatives within the capabilities of the county. A flood mitigation plan achieves the following planning objectives to reduce the risks associated with flooding:

- Confirming that activities are reviewed and implemented so that local problems are addressed by appropriate and efficient solutions.
- Leveraging flood mitigation initiatives with other community goals and activities, preventing conflicts and reducing the cost of implementing each initiative.
- Coordinating local activities with federal, state and regional programs.
- Educating residents on the hazards, loss reduction measures, and natural and beneficial functions of their floodplains.
- Building community support for mitigation initiative priorities.
- Fulfilling planning requirements for obtaining state or federal grant funding.
- Implementing floodplain management and mitigation activities through an action plan with specific tasks, staff assignments, and deadlines.

The Thurston County Flood Hazard Mitigation Plan (FHMP) identifies 20 mitigation initiatives, chosen through a facilitated process focused on meeting these objectives.

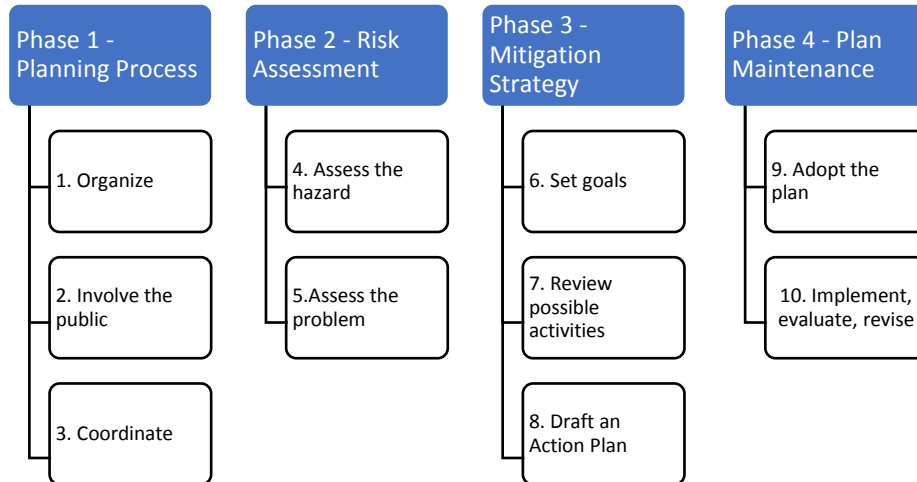
Community Rating System Benefits

The National Flood Insurance Program's (NFIP) Community Rating System (CRS) offers benefits in the form of reduced flood insurance premiums for communities that meet minimum floodplain management requirements. Thurston County exceeds the minimum CRS planning requirements earning a Class 2 rating. This plan is prerequisite for Thurston County to maintain its status as one of the nation's top-rated CRS communities.

Plan Development Methodology

Development of the FHMP included four phases (Figure ES.1).

Figure ES.1: Plan Development Methodology



Phase 1: Planning Process

To oversee the development of the plan, the county assembled a 13-member Flood Planning Committee (FPC), consisting of county staff, community members, and other stakeholders in the planning area. A Plan Development team consisting of key county staff as well as staff from Thurston Regional Planning Council was assembled to provide technical support to the FPC. Full coordination with other jurisdictions, regional stakeholders, and state and federal agencies involved in flood hazard mitigation occurred from the onset to completion of this plan. A public involvement strategy centered on the project website, community meetings, social media, and a flood hazards community survey. A comprehensive review of existing plans and programs was performed that can support flood hazard mitigation. Detailed information about the planning process is documented in Chapter 4.

Phase 2: Risk Assessment

The risk assessment is the process of measuring the potential loss of life, personal injury, economic injury and property damage resulting from flooding. This process assesses the vulnerability of people, buildings, and infrastructure to natural hazards. It focuses on these parameters:

- Hazard identification and profiling

- The impact of hazards on physical, social and economic assets
- Vulnerability identification
- Estimates of the cost of damage

The flood hazard risk assessment for this mitigation plan meets the requirements outlined in Chapter 44 of the Code of Federal Regulations as well as the CRS requirements for assessment of the flood hazard. Detailed information about the county's flood risk assessment is documented in Chapter 2.

Phase 3: Mitigation Strategy

The FPC's key function was to confirm the guiding principles and review and revise the plan's goals and objectives. They also reviewed the county's 2012 FHMP mitigation initiatives and considered new initiatives to update the mitigation strategy. The FPC was involved in selecting and prioritizing the mitigation initiatives and developing the draft action plan. The action plan identifies the leads, timeline, and funding sources for implementing the mitigation initiatives. The Plan Development Team assembled the updated plan using the outcomes of phases 1-3. The updated plan conforms with the CRS Coordinator's Manual Section 510 10-Step Planning Process (see Appendix B). The flood mitigation strategy and this plan's recommendations are documented in Chapter 3.

Phase 4: Plan Maintenance

The Thurston County Board of Commissioners will adopt the plan by October 15, 2017. Chapter 5 includes a maintenance schedule for ensuring the plan remains an active and relevant document. The FPC agrees to maintain its standing and meet annually to review progress on the action plan and advise Thurston County of any changes or revisions to the plan. County staff will prepare a report that documents:

1. Summary of any flood hazard events that occurred during the reporting period and the impact of these events on the planning area
2. Review of mitigation success stories
3. Review of continuing public involvement
4. Brief discussion about why targeted strategies were not completed

5. Re-evaluation of the action plan to determine if the timeline for identified projects needs to be amended (such as changing a long-term project to a short-term one because of new funding)
6. Recommendations for new projects or adjustments to existing mitigation initiatives
7. Review of grant opportunities and other funding options
8. Impact of any other planning programs or initiatives that involve hazard mitigation

Plan Goals and Objectives

The six goals in this plan address important aspects of comprehensive flood management:

- Reducing vulnerability for people and property
- Committing resources to cost effective flood management activities
- Maintaining continuity of operations during flood emergencies
- Protecting the environment
- Providing public education and information sharing
- Coordinating the plan, including public involvement

Each identified mitigation initiative meets one or more objectives. The six goals and 30 corresponding objectives are as follows:

1. **Reduce the county's vulnerabilities to flooding to protect people and essential facilities and to reduce property losses**
 - a. Maintain a regionally coordinated emergency alert notification system that sends timely all-hazard warnings to affected populations
 - b. Identify and sign evacuation routes for areas of the county hardest hit by flooding and road closures
 - c. Train and equip emergency service providers to effectively respond to flood hazard events
 - d. Minimize the number of structures and infrastructure in hazard prone locations
 - e. Safeguard objects or places that have cultural or historical significance

- 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
- 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

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

- a. Identify a team of county staff to manage and implement flood management and flood hazard reduction activities
 - 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
 - c. Create a comprehensive flood mitigation strategy and pursue funding to manage and implement priority projects
 - d. Evaluate practical opportunities to leverage new public and private projects to afford protective measures to surrounding properties with pre-existing flood risks
 - e. Participate in the National Flood Insurance Program including its Community Rating System
 - f. Maintain up to date maps of floodways, floodplains, channel migration zones, and areas subject to high groundwater flooding
 - g. Participate in federal, state, and local all-hazards workshops, programs, and exercises
- Update the Flood Hazard Mitigation Plan and develop and maintain flood response and emergency action plans

3. Maintain essential county government services during emergencies

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

- 4. Restore, enhance, and protect the flood conveyance and ecological functions of channel migration zones, floodways, and floodplains**
 - a. Retain the natural flood water conveyance functions of channel migration zones, floodways, and floodplains through compatible land uses
 - 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
 - c. Prioritize flood mitigation projects that enhance habitat for aquatic species
- 5. Educate and inform residents and businesses to act to minimize their flood risks**
 - a. Improve customer access to county flood information and to staff who are members of the flood management team
 - b. Make flood hazard maps accessible and user friendly, both online and in print at the Permit Assistance Center
 - c. Provide a variety of flood education materials to educate people about the risks of flooding and steps they can take to prevent losses
 - d. Assess needs and provide educational resources to accommodate flood disaster preparedness for special needs individuals or populations within the county
 - e. Inform residents to take precautions to become self-reliant for a minimum of 72 hours during a flood disaster
- 6. Bring the community together to make Thurston County resilient to flood hazards**
 - a. Continue Thurston County participation on the Chehalis River Basin Flood Authority
 - b. Coordinate and provide leadership in the hazard mitigation planning process among local, tribal, state, and federal government partners
 - 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
 - d. Conduct broad outreach activities to engage all sectors of the community in the hazards mitigation planning process

Mitigation Initiatives

The flood hazard mitigation action plan is a key element of this plan. By implementing the action plan, Thurston County can strive to become flood disaster-resilient. The action plan includes an assessment of the capabilities of the county to implement hazard mitigation initiatives, a review of alternatives, a prioritization schedule, and a mitigation strategy that identifies the following:

- Title
- Priority
- Type of activity
- CRS category
- Goals and objectives addressed
- Action
- Rationale
- Benefit Rating
- Status
- Timeline
- Leads
- Cost estimate
- Funding source
- Origin of initiative
- Progress and implementation Status

The plan contains 20 mitigation initiatives, which will require coordination among the county departments charged with their implementation. The initiatives – sorted into seven types of activities – represent the initiatives’ general categories and help organize and communicate the general direction of the strategy. Detailed information about the mitigation strategy is documented in Chapter 3. Table ES.1 summarizes the Thurston County flood mitigation initiatives.

Table ES.1 Summary of Thurston County Flood Mitigation Initiatives

ID	Title	Priority	Top 5 Rank	Status	Cost	Benefit Rating	Timeline	CRS Category
Emergency Planning, Notification, and Evacuation and Detour Routes: Two initiatives expand efforts to notify and provide instructions to affected populations of imminent threats from catastrophic dam failure or flood events. The projects will plan, design, and construct signs, and identify routes for people to reach safe places.								
1	Dam Failure Evacuation Planning and Response	Medium	n/a	In progress	Medium	High	2017-2021, Short term	Emergency Services, Public Information
2	Flood Detours and Response Planning	High	n/a	In progress	Medium	Medium	2017 – 2021, Short term	Emergency Services, Public Information
Infrastructure: Two initiatives will replace, repair, or reconstruct public infrastructure including stream culverts, bridges, and roads. The projects will minimize flood impacts, address public safety, improve transportation mobility, and enhance aquatic habitat.								
3	Stream Culvert Replacement Flood Mitigation Program	High	3	Ongoing	High	High	2017 – 2030, Long term	Natural Resource Protection, Structural
4	Road Repair and Reconstruction Flood Mitigation Program	High	5	Ongoing	High	High	2017 – 2030, Long term	Property Protection, Natural Resource Protection
Mapping, Data Collection, and Data Protocols: Seven initiatives support improving the community's knowledge of how, when, and where flooding occurs. Additional data enhances the county's ability to accurately forecast the location and extent of high groundwater flooding, understand the impacts of climate change, identify structures at risk, and map hazard areas. These initiatives also establish protocols for documenting historic flood conditions, archiving data and maps, and improving processes to make the data accessible to county staff, community members, and other stakeholders.								
5	Flood Data Collection, Modeling, and Evaluation Program	Medium	4	In progress	Medium	Medium	2017-2021, Ongoing	Prevention, Emergency Services
6	HAZUS – Flood Model Development and Maintenance Program	Low	n/a	Ongoing	Medium	Low	2017-2021, Short term	Prevention, Public Information
7	Risk Map Land Use and Development Regulation Review and Revisions	High	n/a	In progress	Low	Medium	2017-2021, Short term	Prevention, Public Information
8	Flood Map Refinement and Access	Low	n/a	In Progress	Medium	Low	2017-2021, Short term	Prevention, Public Information
9	Flood Map and Data Storage and Retrieval Program	Medium	n/a	In progress	Low	Low	2017-2021, short term	Prevention
10	River Channel Migration Zone and Habitat Mapping Program	Medium	n/a	Ongoing	Low	Low	2017-2021, Short term, Ongoing	Prevention
11	Building Inventory and Mapping Program	Medium	n/a	Ongoing	Low	Low	2017-2021, Short term, Ongoing	Prevention
Flood Hazard Reduction: Two initiatives will develop and formalize programs to prevent future property losses. One will evaluate, prioritize, and fund candidate structures for elevation, relocation, or acquisition. The other consists of an inspection program to monitor and remove excess debris accumulation in stream channels that compound flood problems into public assets or private property.								
12	Vulnerable Structures and Repetitive Loss Mitigation Program	High	1	Ongoing	High	High	2017-2030, Long term, Ongoing	Prevention, Property Protection
13	Debris and Sediment Inspection and Flood Hazard Reduction Program	Medium	n/a	New - No Progress	Medium	High	2017-2021, Short-term	Prevention, Property Protection, Natural Resource Protection, Emergency Services

ID	Title	Priority	Top 5 Rank	Status	Cost	Benefit Rating	Timeline	CRS Category
Natural Functions and Ecosystem Services: Two initiatives protect and restore natural floodplain functions and enhance aquatic and riparian habitat.								
14	Floodplain Restoration and Reconnection	Medium	n/a	Ongoing	High	Medium	2017-2030, Long-term, Ongoing	Prevention, Natural Resource Protection, Structural
15	Riparian Flood Control and Habitat Reforestation Project	Medium	n/a	New - No Progress	High	Medium	2017-2030, Long term	Prevention, Natural Resource Protection
Finance, Implementation, and Coordination: Three initiatives will evaluate and implement opportunities to effectively fund the initiatives in this plan, to manage and coordinate the county's various flood management work programs across all involved departments, and to coordinate with external stakeholders.								
16	Comprehensive Flood Program Finance Strategy	High	2	New - No Progress	Low	Medium	2017-2019, Short term	Prevention
17	Community Rating System Program	High	n/a	Ongoing	Medium	Medium	2017-2019, Ongoing	Prevention, Public Information
18	Thurston Climate Adaptation Plan Evaluation and Plan Integration	Medium	n/a	New - No Progress	Low	Low	2018-2021, Short-term	Prevention
Public Education and Awareness: Two initiatives will improve public access to information and engage affected residents and businesses about flood risks, flood prevention, county flood ordinances and regulations, flood insurance, and other resources.								
19	Flood Hazard Education and Hazard Reduction Public Outreach Strategy	Medium	n/a	Ongoing	Low	Low	2017-2021, Ongoing	Public Information
20	Flood Website Development	High	n/a	In progress	Low	Low	2017-2019, Short term	Public Information

Implementation

Implementing the recommendations of this plan requires time and resources. The plan reflects an adaptive management approach, providing recommendations and review protocols to evaluate changes in conditions after the plan is adopted. The true measure of the plan's success will be its ability to adapt to the ever-changing climate of hazard mitigation.

Funding resources are always evolving, as are programs based on state or federal mandates. Thurston County has a long-standing tradition of proactively responding to issues that may impact its citizens and this is reflected in the development of this plan. The county's floodplain management programs and policies are well established and have maintained the flood risk at a steady level without increase. This plan will help maintain this tradition. It identifies a strategy for implementation based on available and potential resources. Most important, the county developed this plan with extensive public input.