

# Executive Summary

The Grays Harbor County Hazard Mitigation Plan, 2005 -2010, guides county government in how to work with citizens, other local governments, and the private sector in reducing the threat of disaster events to life and property before they happen. The plan does this by establishing a series of goals, objectives, and mitigation actions for the county to accomplish over the next five years.

## Plan Organization

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The plan focuses on risk reduction and loss-prevention planning relating to nine natural hazards: floods, earthquakes, windstorms, tsunamis, winter storms, landslides, volcanoes, wildland fires, and tornado. It also addresses threats from hazardous material incidents.

The Grays Harbor County Hazard Mitigation Plan contains two parts. Part 1 is the Mitigation Plan itself containing these sections:

- Section 1 Introduction to the Hazard Mitigation Plan
- Section 2 Documentation of the Planning Process
- Section 3 Hazard Mitigation Goals and Objectives
- Section 4 Hazard Mitigation Actions and Implementation Strategies
- Section 5 Strategies for Economic Analysis of Mitigation Actions
- Section 6 Plan Maintenance Procedures

The second part of the plan is the Hazard Identification and Vulnerability Assessment. The data and analysis in Part 2 serves as the foundation to Part 1 and is key to understanding the rationale behind its policies promulgated in the goals, objectives, and mitigation actions. It includes the following sections:

- Section 7 Introduction to the Hazard Identification and Vulnerability Assessment
- Section 8 County Profile
- Section 9 County Capability Analysis
- Section 10 Prioritization of All Hazards
- Section 11 Flood Hazard Profile
- Section 12 Earthquake Hazard Profile
- Section 13 Windstorm Hazard Profile
- Section 14 Tsunami Hazard Profile

- Section 15 Winter Storm Hazard Profile
- Section 16 Hazardous Materials Profile
- Section 17 Landslide Hazard Profile
- Section 18 Volcano Hazard Profile
- Section 19 Wildland Fire Hazard Profile
- Section 20 Tornado Hazard Profile

## **Plan Development**

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Developing the Grays Harbor County Hazard Mitigation Plan was a partnership between the Grays Harbor County Hazard Mitigation Planning Team (HMPT), county departments, and county residents. The HMPT consisted of 17 individuals appointed by the Board of County Commissioners representing government, geographic areas of the county, other public agencies, and private businesses. These members directed plan development during five workshops, seven citizen participation events, and several independent work assignments.

The Board of County Commissioners adopted this plan as official county policy after the review and approval of the Emergency Management Division of the Washington State Military Department and the US Federal Emergency Management Agency, Region X.

## **Hazard Mitigation Goals and Objectives**

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The county has established six broad goals for hazard mitigation. Accompanying each goal is a series of objectives that serve as milestones for marking its achievement.

### **▣ Prevention Goal**

A well-established Grays Harbor County hazard mitigation program will reduce the risks associated with natural and human caused hazards.

This program will rely on an atmosphere of cooperation among the private sector, county government, and state and federal agencies to promote mitigation planning and coordination of achieving objectives.

Grays Harbor County will build the necessary institutional capacity for an effective hazard mitigation program and will secure public and private financial resources for investment in hazard mitigation planning, implementation actions, and post disaster recovery.

### **⊙ Prevention Objectives**

1. Emphasize preventative measures that eliminate or reduce hazard impacts in all County plans, regulations, and programs.
2. Promote partnerships between the county, state, and federal agencies, the Confederated Tribes of the Chehalis, and the Quinault Indian Nation to pursue joint hazard mitigation efforts.
3. Develop a coordinated mitigation approach with all the incorporated cities in Grays Harbor County.
4. Assure plans are in place to reduce the public health impacts of a disaster event.
5. Prevent land development in extreme hazard prone areas.
6. Minimize disruption of utility and transportation systems.
7. Identify resources to provide ongoing program support and funding for hazard mitigation programs and projects.

### **▣ Property Protection Goal**

Grays Harbor County will seek to reduce the impact of hazards on the built environment whenever possible. It will place particular emphasis on actively safeguarding critical facilities in hazard prone areas to protect public health and safety.

### **⊙ Property Protection Objectives**

1. Promote the use of appropriate hazard resistant design, construction, and maintenance for all structures, both public and private.
2. Support programs that assist homeowners and businesses establish hazard mitigation measures on their property.
3. Develop hazard resistant protective measures for critical facilities and lifelines.
4. Encourage the retrofit of critical facilities in hazard areas to protect public health and safety.
5. Protect valuable historic and cultural resources.

## **▣ Public Education and Awareness Goal**

Grays Harbor County citizens, businesses, and visitors will be informed, prepared for, and recognize what actions to take during and after a hazard event.

### **◎ Public Education and Awareness Objectives**

1. Make available programs and information to assist residents, businesses, and visitors prepare for and recognize what actions to take during and after a hazard event.
2. Increase awareness of mitigation actions that reduce the impact of hazards.
3. Develop cooperative education and awareness programs with non-profit and private organizations that provide disaster programs.
4. Disseminate information to the public about specific emergency action plans and procedures.

## **▣ Structural Projects Goal**

Support development of suitable structural projects that significantly reduce the impact of a hazard when no other option is feasible.

### **◎ Structural Projects Objectives**

1. Prioritize and secure funding for all structural projects identified in existing plans.
2. Identify and prioritize the need for new structural projects to increase protection of life, property, and the natural environment.

## **▣ Emergency Services Goal**

Grays Harbor County will have sufficient expertise and resources for emergency preparedness, response, and recovery to reduce the loss of life and property damage due to hazard events. It will have a reliable communication system that will coordinate action between emergency responders, the public, and media outlets before, during, and after a hazard event. Furthermore, disaster events will not significantly disrupt county emergency operations and services.

### **☉ Emergency Services Objectives**

1. Provide for a well-trained group of professional and volunteer emergency personnel with the capability to effectively respond to hazard events.
2. Assure effective coordination with all local, state, and federal agencies during a hazard event.
3. Maintain a secure, dedicated emergency communication system with built in redundancy.
4. Minimize disruption to public facilities and services during a hazard event.

### **☐ Natural Resource Protection Goal**

Grays Harbor County will promote natural resource protection that protects life and public safety.

### **☉ Natural Resources Protection Objectives**

1. Conserve and rehabilitate natural systems to serve hazard mitigation functions.
2. Advocate responsible “best management practices” for land development, recreational activities, and commercial operations to reduce damage or loss of natural resources.
3. Support effective natural resources of commercial significance and critical areas plans and regulations.

## **Mitigation Actions and Implementation Strategies**

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The County has identified and prioritized Tier 1 and 2 Mitigation Actions to implement the plan’s goals and objectives, contingent upon receiving grant funding. Tier 1 Actions are projects or activities eligible for funding through FEMA’s Hazard Mitigation Grant Program (HMGP) while Tier 2 Actions are not. Both Tier 1 and 2 actions are equally important to the county’s hazard mitigation efforts and both may be eligible for other local, state, federal, or nonprofit funding opportunities.

Each Mitigation Action in both tiers has an accompanying implementation plan that lists:

- Lead Agency. The county department/division responsible for coordinating implementation of the mitigation action.

- **Supporting Agencies.** Those agencies expected to play a supporting role for the Lead Agency during implementation.
- **Projected Timeline.** The anticipated timeframe for implementing a mitigation action.
- **Resources/Funding.** A list of potential resources and funding for implementing the mitigation action.

A summary of Tier 1 and 2 Mitigation Actions follows on the next four pages.

**Table 1**  
**Summary of Tier 1 and Tier 2 Mitigation Actions**  
*MH – Multi-Hazard, F – Flood, T – Tsunami*

Rank	Tier 1 Actions	Natural Hazard	Lead Agency	Implementation Timeline	Plan Page	Plan Goals					
						Prevention	Property Protection	Public Ed and Awareness	Structural Projects	Emergency Services	Natural Resource Protection
1	Use existing bridge inspection data to prioritize and retrofit/replace county bridges to increase their resilience to hazard events.	MH	Public Works Div.	Every 2 years			●				
2	Distribute hazard mitigation information and publications published by FEMA, Washington State Emergency Management Division, Red Cross, Cooperative Extension Service, and other agencies and organizations to all public libraries and schools throughout the county to promote citizen commitment to hazard mitigation.	MH	Emergency & Risk Management Div.	On-going				●			
3A	Evaluate, prioritize, and retrofit county critical facilities in hazard areas to increase their resistance to hazard events.	MH	Utilities & Development Div.	1-5 years			●				
3B	Establish and maintain a coast-wide siren warning system with distinguishable tones coded to hazard event.	MH	WS Emergency Mgt. Div.	1-5 years						●	
3C	Work with WSDOT to augment current tsunami evacuation signs with safe elevation markers in key areas and signs painted directly on roadways.	T	WS Emergency Mgt. Div.	2-3 years				●		●	
4	Implement the recommendations within the Vance Creek Drainage Evaluation and the South Coastal, North Beach, and Grays Harbor county Flood Hazard Management Plan	MH	Utilities & Development Div.	5 years					●		●
5	Promote the need for any revisions to current FEMA floodplain maps.	F	Dept. of Public Services	1-5 years		●	●	●			

Rank	Tier 1 Actions	Natural Hazard	Lead Agency	Implementation Timeline	Plan Page	Plan Goals					
						Prevention	Property Protection	Public Ed and Awareness	Structural Projects	Emergency Services	Natural Resource Protection
6	Implement a home elevation and buyout program for repetitive loss properties in the Wynoochee, Satsop and Humptulips River Basins and the North and South Coast Areas as funding becomes available.	F	Utilities & Development Div./Planning & Building Div.	On-going			●				
7	Establish a program in cooperation with fire districts, tribes, and private property owners that provides emergency public access to locked gated roads during hazard events and procedures for addressing traffic backups.	T	Emergency & Risk Management Div.	1-3 years						●	
8A	Work with the Washington State Department of Transportation, public and private utility providers and the Puget Sound and Pacific Railroad to implement a cooperative tree trimming and removal program along state highways, county road, utility corridors, and railways.	MH	Public Works Div.	2-3 years		●	●				
8B	Have human services providers and volunteers check up on the elderly and special needs populations during hazard events to assure they have a safe source of heat and adequate food, water, and medications	MH	County Sheriff & Senior Chore Service	1-2 years						●	
9	Encourage citizens and businesses to have access to the NOAA Weather Radio (NWR) service, including supporting efforts to purchase NWP receivers for low-income households as well as provide public information about using them effectively.	MH	Emergency & Risk Management Div.	On-going						●	
10	Encourage installation of utilities underground in new short subdivisions, subdivisions, and commercial developments and provide incentives for replacing above ground utilities with underground ones.	MH	Planning & Building Div.	1-2 years		●	●				

Rank	Tier 2 Mitigation Actions	Natural Hazard	Lead Agency	Timeline	Plan Reference	Plan Goal					
						Prevention	Property Protection	Public Ed and Awareness	Structural Projects	Emergency Services	Natural Resource Protection
1A	Actively search for grants and loans to fund hazard mitigation projects and programs in Grays Harbor County.	MH	Emergency & Risk Management Div.	On-going		●					
1B	Support the Public Health and Social Services Department to make information available on basic health problems and solutions during and after disasters, especially concerning water contamination and food spoilage.	MH	Dept. of Public Health & Social Services	1-2 years				●			
2A	Set funding priorities for hazard mitigation projects annually based on urgency and need.	MH	Utilities & Development Div.	Every 5 years		●	●	●	●	●	●
2B	Establish interagency radio links between the Grays Harbor Emergency Operation Center, law enforcement agencies, fire districts, emergency medical services, the 911 call center, and state and federal agencies to ensure efficient and coordinated communication during hazard events.	MH	Emergency & Risk Management Div.	On-going						●	
3A	Rate hazard mitigation projects needed to protect public safety as high priority in the county's Capital Improvement and Road Plans.	MH	Dept. of Public Health & Social Services	Every 5 years		●	●	●	●	●	●
3B	Join the National Flood Insurance Community Rating System program	F	Planning & Building Div.	1-2 years		●	●	●			
4	Create a Disaster Information Section on the Grays Harbor County Emergency Services Home Page with up-to-date information on: current storm watches and warnings; road closures; evacuation routes; shelter locations; emergency contacts; the Hazard Mitigation	MH	Central Services Dept.	1-2 years				●			

Rank	Tier 2 Mitigation Actions	Natural Hazard	Lead Agency	Timeline	Plan Reference	Plan Goal					
						Prevention	Property Protection	Public Ed and Awareness	Structural Projects	Emergency Services	Natural Resource Protection
	Planning; and an interactive comment tool.										
5	Research and maintain a list of grant and low-interest loan programs that assist homeowners and businesses undertake hazard mitigation projects.	MH	Emergency & Risk Management Div.	2-3 years			●				
6	Improve and maintain an effective Telephone Warning System	MH	Emergency & Risk Management Div.	3-5 years						●	
7	Develop partnerships with county school districts to teach children about weather watches and warnings, hazard mitigation, emergency actions, early release plans and emergency service providers.	MH	Emergency & Risk Management Div.	2-3 years				●		●	
8	Develop a damage assessment program that includes ongoing training for assessment team personnel.	MH	Emergency & Risk Management Div.	1-2 years						●	
9A	Establish a protocol between County departments, state agencies, and all other providers of emergency services to assure consistency of public information provided during a disaster.	MH	Emergency & Risk Management Div.	1-2 years				●		●	
9B	Establish a protocol for controlled distribution of food, water, and medical services at specific sites during and/or immediately after a disaster.	MH	Emergency & Risk Management Div.	2-3 years						●	
9C	Make available to first responders a current list of citizens on life support, who are homebound with special needs, and elderly populations for emergency response and/or rescue during a hazard event.	MH	Emergency & Risk Management Div.	2-3 years						●	

Rank	Tier 2 Mitigation Actions	Natural Hazard	Lead Agency	Timeline	Plan Reference	Plan Goal					
						Prevention	Property Protection	Public Ed and Awareness	Structural Projects	Emergency Services	Natural Resource Protection
10A	Provide the public with information on the proper use of 911 during a hazard event using such tools as telephone books, bookmarks for school children, and posters in public buildings.	MH	Emergency & Risk Management Div.	1-2 years				●			
10B	Develop post-disaster debris dumping sites in a representative number of locations throughout the county, including an evaluation of the sites for conformance with Title 17 of the Grays Harbor Code.	MH	Utilities & Development Div.	2-3 years			●				
11A	Support development of sub-area plans for local communities and neighborhoods in remote areas that identify coordinators and resources to assist with hazard mitigation, disaster responses, and recovery.	MH	Emergency & Risk Management Div.	1-3 years						●	
11B	Establish and maintain a disaster contingency fund within the Grays Harbor County budget.	MH	Dept. of Public Services	1-2 years		●	●	●	●	●	●
12A	Organize and keep current a central database listing the equipment needs of all emergency services providers in Grays Harbor County to make the public aware of needs and facilitate cooperative funding opportunities.	MH	Emergency & Risk Management Div.	1-2 years						●	
12B	Work with School Districts to secure satellite phones in all school buses that regularly transport children in or through tsunami inundation zones.	T	Emergency & Risk Management Div.	1-2 years						●	
13	Establish a Memorandum of Agreement with Pacific County and the Shoalwater Tribe for cooperative plans and actions for South Beach area.	MH	Board of County Commissioners	1-3 years						●	

## **Strategies for Economic Analysis of Mitigation Actions**

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Preparing an economic analysis of each mitigation action is crucial for the county in evaluating whether or not it is worth implementing before damages occur from a disaster. The plan identifies two analytical approaches for weighing the benefits of alternatives: cost/benefit ratio and cost effectiveness analyses. It also includes a strategic process for county decision makers to use these tools during project development.

## **Plan Maintenance Procedures**

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Once the Board of County Commissioners adopts the Grays Harbor County Hazard Mitigation Plan, regular plan maintenance is necessary to keep hazard mitigation effective for county government, rural residents, and businesses.

The County Local Emergency Planning Committee (LEPC) will be the responsible body for annually reviewing the plan and making recommendations to the Board of County Commissioners for revisions and additions. Assisting the LEPC will be the 17 members of the Hazard Mitigation Planning Team, a subcommittee of the LEPC. HMPT will begin monitoring the plan annually in June, reporting its results to the LEPC the following September 15<sup>th</sup>. The LEPC reviews the HMPT recommendation in light of its own mission, and then passes its recommendation unto the County Commissioners by November 15<sup>th</sup>. The County Commissioners will hold a public hearing on the LEPC/HMPT recommendation before taking any action in amending the plan.

In 2011, the county will undergo a complete update of the document with adoption before the next five-year plan cycle begins.

## **Continuing Citizen Participation**

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Grays Harbor County recognizes that citizen involvement in hazard mitigation planning is the foundation to a successful program. Early and continuous participation in plan development and implementation of mitigation actions is essential.

To keep hazard mitigation continuously in the public eye, the county will use a variety of public awareness and educational methods that include an interactive web site, using national and county events, and maintaining information boards and kiosks at a variety of county locations. Citizens are encouraged to participated annually in the Hazard Mitigation Plan update as well.

Part 1

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# Hazard Mitigation Plan

## Section 1

# Introduction to the Hazard Mitigation Plan

The Grays Harbor County Hazard Mitigation Plan is a framework of policies adopted by the Grays Harbor Board of County Commissioners that direct county resources at reducing the potential impacts of disaster events on lives and property over the next five years.

The disaster events this plan focuses on in priority are:

- Floods
- Earthquakes
- Windstorms
- Tsunami
- Winter storms
- Landslides
- Hazard Materials Incidents
- Volcanoes
- Wildland Fire
- Tornado

With a plan in hand for dealing with disasters before they strike, Grays Harbor County can provide important benefits to citizens, businesses, and industries by

- Reducing the loss of life, property, essential services, critical facilities, and economic hardship caused by disasters;
- Lowering short- and long-term recovery and reconstruction costs from disasters;
- Increasing cooperation and communication within the community before, during, and after disasters; and
- Speeding up pre-disaster and post-disaster grant assistance.

The scope of the Grays Harbor County Hazard Mitigation Plan focuses solely on the jurisdictional interests of Grays Harbor County. These interests encompass the rural population, property, businesses, and industries located outside of the county's nine municipalities. It also includes the public services and infrastructure that serve the needs of this area, such as roads, law enforcement, and utilities. The county's jurisdictional interests within this plan does extend over municipal boundaries when it focuses on public services and facilities that serve both rural and urban county residents, as is the case with public health services. Finally, the plan also addresses the needs of county facilities located within cities and other critical facilities in urban areas that serve rural residents, such as hospitals and schools. Grays Harbor County encourages all of the county's nine municipalities and its many special use districts in coordinating and integrating their hazard mitigation plans with this one for seamless countywide coverage.

The structure of the plan conforms to the planning standards established by the Federal Emergency Management Agency (FEMA) for Local Hazard Mitigation Plans as well as the Washington State Emergency Management Division (WSEMD). To meet these standards, the plan must:

- Document the planning process;
- Identify and profile hazards;
- Assess the county's vulnerability to disasters by estimating potential losses, identifying assets, and analyzing development trends;
- Set goals, objectives, and mitigation measures with implementation strategies, for hazard mitigation;
- Establish procedures for monitoring, evaluating, and updating the plan; and
- Examine implementation through existing programs; and
- Provide a plan for continued public involvement.

Before adoption by the Board of County Commissioners, the Grays Harbor County Hazard Mitigation Plan undergoes review and comment by both WSEMD and FEMA. A plan deemed in compliance with the plan criteria will make the county eligible for funding under the Hazard Mitigation Grant Program.

## Section 2

# Documentation of the Planning Process

The planning process leading to the development of the Grays Harbor County Hazard Mitigation Plan began in August 2004 with a grant award from the Pre-Disaster Mitigation Competitive Grant Program. The county matched this award with in-kind contributions in staff time and then contracted with the consulting firm of Creative Community Solutions to design and implement the hazard mitigation planning process.

Earlier in the grant application process, the county decided to focus the hazard mitigation plan on nine different hazards. In its 2004 Washington State Hazard Mitigation Plan, the WSEMD identified five natural hazards with the greatest potential to adversely affect people, environment, economy, and property in Grays Harbor County. These five natural hazards are floods, earthquakes, severe storms (high winds, tornado and coastal flooding), landslides, and tsunamis. The state selected these natural hazards through a rigorous review process that considered scientific data, history of occurrences, damage reports, and potential impacts to people.

In addition to these state-identified natural hazards, Grays Harbor County expanded severe storms to include winter storms, as well as adding volcano and wildland fires due to local concerns about the impacts caused by these natural hazards to life and property within the recent past. The addition of hazardous material incidents to the HIVA, too, reflects community caution over the extensive presence of hazardous materials in the county used in manufacturing processes.

Key to the consultant's approach was the appointment of a Hazard Mitigation Planning Team (HMPT) by the Board of County Commissioners in October 2004. The HMPT would consist of 17 members representing citizens at large, local emergency management agencies and organizations, and private industry from throughout the county. The names, representation, and interest of these members follow in Table 2.

The purpose of the HMPT was to serve as an advisory body to the Board of County Commissioners in guiding the content development of the plan. The HMPT accomplished this task between October 2004 and April 2005 in workshops by focusing on:

- Learning about the importance of hazard mitigation and what it entails
- Developing an appropriate citizen information and outreach plan

- Identifying hazards
- Understanding the legal framework for hazard mitigation
- Assessing risks from natural and man-made hazards
- Identifying mitigation goals, objectives, and mitigation actions
- Setting up an implementation and monitoring program

**Table 2**  
**Hazard Mitigation Planning Team Participants**

Members	Representing	Interests
Marty Best	State of Washington, Military Department	State emergency management
Anne Sullivan	Grays Harbor County	County emergency management
Ernie Lysen	Citizen Position	Copalis Beach
Ed McCullough	Puget Sound & Pacific Railroad	Railroad
Rick Lovely & Ed Pauley	Grays Harbor Public Utility District	Utility providers
Tim Scherer & John Todd	Weyerhaeuser Corporation	Timber
Vic Davis	Citizen Position	Elma Planning Commission & transportation issues
Dave Davis	Citizen Position	GHC PC, Fire District, Water District, Lake Quinault
Ray Sowers	Monte PD	Law Enforcement
Monica Simpson	Citizen Position	Hospital
Jeremy Hawkins	Citizen Position	South Beach
John Pellegrini	Grays Harbor Paper, LLC	Mill
Karolyn Luzzi	GHC Public Health and Social Services	Public health
Lee Napier	Grays Harbor County	Contract management
Darrel Haglund & Jim Westby	Grays Harbor Fire District #7	Fire commissioners & chiefs
Denise Stewart	Grays Harbor Community Hospital	Hospital
Matt Stowers & Dave Porter	Sheriff's Office	Law enforcement

Table 3 shows a schedule of these workshops and their accomplishments during the hazard mitigation planning process.

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**Table 3**  
**Hazard Mitigation Planning Schedule**

2004

October 19th: Planning Team evening workshop (3 hours)

- Orientation
- Design Citizen Participation Program

November 16th: Planning Team evening workshop (3 hours)

- Hazard Identification
- Finalize Citizen Participation Program

December: Draft Hazard Profile and Risk Analysis Review

2005

January 8th: Planning Team Saturday Workshop (9am - 3pm)

- Policy/Legal Framework
- Hazard Rating
- Identification Strength/Weaknesses in current hazard mitigation planning
- Develop Goals and Objectives

January 18, 19, 20: Citizen Participation Open/House and Workshops

- Look at hazard problems
- Suggest mitigation actions

February 15th: Planning Team Workshop evening (3 hours)

- Prepare Preliminary Mitigation Action for community review

March 1, 2, 3: Citizen Participation Listening Posts

- Select priorities for mitigation actions

April 2<sup>nd</sup> : Planning Team Workshop Saturday Workshop (9am - 3pm)

- Draft mitigation actions
- Implementation strategies
- Plan maintenance procedures

April - June

- Draft plan preparation

July - August

- Draft plan available for local, state, and FEMA review
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The first two workshops for the HMPT focused on organizational issues, learning about hazard mitigation planning in general, understanding the purpose of the Hazard Identification and Vulnerability Assessment (HIVA), and designing a citizen participation program.

Designing an appropriate citizen participation program was a particularly critical task for the HMPT. Their intimate knowledge of the community placed them in a unique vantage point of knowing how to best get the word out about participation opportunities to unincorporated residents. They also served as a strong reality check for the consulting team in evaluating whether citizen participation techniques would or would not be successful.

The purpose behind the HMPT in getting citizens involved in the hazard mitigation program was threefold. First, active citizen participation is a requirement that FEMA and WSEMD have integrated throughout its planning criteria. Second, it would provide the HMPT with an opportunity to learn from citizens about their ideas, expectations, and concerns regarding hazard mitigation. This feedback would prove invaluable for the HMPT in later evaluating citizen acceptance of hazard mitigation efforts. Finally, it would give citizens the chance to learn about the need for and how to become personally involved in hazard mitigation. By building public support for hazard mitigation now, the hope was that citizens would become active supporters later on when implementation gets underway.

In addition, the HMPT wanted to make the planning process accessible to residents throughout the rural areas of the county and to learn about the differences in local hazard mitigation needs. To this end, the HMPT divided the county into three planning areas that mirrored Commissioner Districts 1, 2, and 3. Members agreed to publicize, attend, and participate in two series of citizen participation events at public locations in each district.

With the release of the first draft of the Hazard Identification and Vulnerability Assessment (HIVA) in December 2004, the HMPT participated in a January 2005 brainstorming workshop for generating broad and specific proposals for hazard mitigation. The outcome from the workshop was an extensive list of ideas that would later serve as the foundation to developing goals, objectives, and mitigation actions.

Soon after this workshop was the first citizen participation event. An Open House and Workshop on Hazard Mitigation Planning occurred in the communities of Ocean City, the South Beach area, Neilton, and Montesano during the evenings of January 18, 19, and 20, 2005. During the informal Open House, citizens had the opportunity to learn about hazards by looking at displays and asking questions of both HMPT members and the consulting team. Citizens then had the opportunity to share their ideas for hazard mitigation at an organized Workshop held immediately after the Open House.

The consulting team next sorted through the ideas collected at the January HMPT and citizen participation workshops to produce a first draft of a goals and objectives for hazard mitigation. The consultants also produced from this list what were to become over 90 mitigation actions.

In February, the HMPT focused on establishing a county list of prioritized hazards. Prioritization of the hazards would prove an important consideration for the county; it provides crucial guidance in how the county would be targeting its limited resources in a way that would render the most effective result at reducing the risk to life and property from hazards.

To prioritize these hazards, the HMPT reviewed and prioritized each one in relation to four criteria:

- Likelihood of event every 20 years
- Percent of total county population exposed to a hazard
- Number of structures exposed to a hazard; and
- Property damage in millions of dollars

Each criterion in turn had an assigned ranking value as shown in Table 4, which rendered the results listed in Table 5.

**Table 4  
Prioritized Ranking Criteria**

Criterion	Low	Medium	High
Likelihood of event every 20 years	0-1 events	2-3 events	<4 events
Percent of people exposed to a hazard	<1%	1-10%	>10%
Number of structures exposed to a hazard	0-50	51-100	>100
Property damage in dollars (\$000,000)	\$1-10	\$10-50	>\$50

**Table 5  
Hazard Ranking**

Rank	Hazard	Likelihood	Percent of People	Number of Structures	Property Damage	Total Score
1	Flood	3	3	3	3	12
2	Earthquake	2	3	3	3	11
3	Wind Storm (Severe Storm)	3	2	3	2	10
3	Tsunami	1	3	3	3	10
4	Winter Storm (Severe Storm)	3	2	2	2	9
5	Hazardous Materials Incident	1	2	2	3	8

6	Landslide	3	1	2	1	7
6	Volcano (Ash)	1	1	3	2	7
7	Wildland Fire	1	1	2	2	6
7	Tornado	2	1	1	1	5

A secondary task of the February workshop was for the HMPT to review the consultant’s first draft of the hazard mitigation goals and objectives.

In March 2005, the HMPT began their second series of citizen participation events. At evening Listening Posts held in Elma, Ocean City, and the South Beach area on March 1, 2, and 3, 2005, the HMPT asked citizens to review draft mitigation actions and select their top five choices for implementation. The collated results from the Listening Posts would guide the HMPT in understanding which type of mitigation actions the community would be most likely to support.



The following April 2005 HMPT workshop concentrated on selecting and prioritizing hazard mitigation actions for inclusion in the plan. This was a difficult process for the HMPT because there were over 90 potential mitigation actions generated through their earlier February workshop and the January citizen participation events.

The HMPT approached the prioritization task by first identifying which of the proposed mitigation actions were eligible under the Hazard Mitigation Grant Program (HMGP) and which ones were not. The outcome of this analysis was the separation of mitigation actions into Tier 1 or Tier 2 lists. Tier 1 Actions were to be those actions eligible for funding under the HMGP and Tier 2 Actions were not. It is important to note that even though Tier 2 were not HMGP-eligible actions, the HMPT deemed them important for establishing a strong hazard mitigation in Grays Harbor County. Furthermore, many of

the Tier 2 Actions may be eligible for funding from other local, state, and federal programs.

The next step was to do a “first cut” that would reduce the list of mitigation actions for consideration. Such an effort was essential given the sheer number of mitigation actions that stretched beyond the county’s implementation capacity. The HMPT did this by considering the HIVA, the efficacy of each mitigation action in light of achieving the Hazard Mitigation Goals and Objectives, and public support. The outcome of this distillation effort was 13 Tier 1 and 23 Tier 2 Actions.

To assign priority to Tier 1 and Tier 2 Action, the HMPT applied ten evaluation criteria to each mitigation action using a plus-minus scale. Table 6 lists and explains each criterion. The prioritized list of Tier 1 and 2 actions in Section 4 is the product of this analysis.

**Table 6**  
**Hazard Mitigation Action Evaluation Criteria**

Evaluation Criteria	Analysis
1. Benefit to community	Does the action provide a wide or narrow benefit to the highest number of people or properties in the county?
2. Addressing Multi-Hazards	Will the action address more than a single hazard?
3. Public support	What is the likelihood that the citizens would support the action?
4. Effectiveness	How effective is the action in avoiding or reducing future losses to life or property?
5. Environmental impact	Will this action comply with local, state, and environmental protection laws?
6. Cost-to-benefit	Does the potential cost for the action seem reasonable in comparison to the long-term benefit it brings to property and lives?
7. Benefit to local economy	Does the action contribute to countywide economic development?
8. Legal authority	Does the county have the legal authority to implement the proposed action?
9. Availability of outside funding	Are there grants or loans available from state or federal sources for funding the action?
10. Availability of local funding	Is it reasonable to assume that local government could fund some or all of the action?

Despite reducing the number of draft mitigation actions for consideration through this process, the county acknowledges the value of all hazard mitigation action ideas and includes them in Appendix A for potential incorporation in future Hazard Mitigation efforts.

A first draft of the Hazard Mitigation Plan went before the HMPT and county staff for review in August 2005. Submittal to WSEMD and FEMA followed in August 2005. Once approved in content and format by these agencies, the Board of County Commissioners formally adopted the plan by resolution.

## Section 3

# Hazard Mitigation Goals and Objectives

Grays Harbor County has adopted six Hazard Mitigation Goals for protecting people and structures, reducing the costs of disaster response and recovery, and minimizing disruptions to the local economy and public services. The six goals correspond to the Federal Emergency Management Agency (FEMA) Hazard Mitigation Categories.

These six goals are long-term policy achievements that Grays Harbor County intends to accomplish over the next five years. Accompanying each goal is a series of Hazard Mitigation Objectives – specific and measurable milestones that mark the county’s path towards success in achieving the implementation of each goal.

## **Prevention**

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*Prevention goals influence land development, construction practices, and public activities that reduce losses from hazard events.*

### **▣ Prevention Goal**

A well-established Grays Harbor County hazard mitigation program will reduce the risks associated with natural and human caused hazards.

This program will rely on an atmosphere of cooperation among the private sector, county government, and state and federal agencies to promote mitigation planning and coordination of achieving objectives.

Grays Harbor County will build the necessary institutional capacity for an effective hazard mitigation program and will secure public and private financial resources for investment in hazard mitigation planning, implementation actions, and post disaster recovery.

### **◎ Prevention Objectives**

1. Emphasize preventative measures that eliminate or reduce hazard impacts in all County plans, regulations, and programs.

2. Promote partnerships between the county, state and federal agencies, the Confederated Tribes of the Chehalis, and the Quinault Indian Nation to pursue joint hazard mitigation efforts.
3. Develop a coordinated mitigation approach with all the incorporated cities in Grays Harbor County.
4. Assure plans are in place to reduce the public health impacts of a disaster event.
5. Prevent land development in extreme hazard prone areas.
6. Minimize disruption of utility and transportation systems.
7. Identify resources to provide ongoing program support and funding for hazard mitigation programs and projects.

## **Property Protection**

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*Property protection involves the modification of existing buildings and structures to protect them from a hazard or their removal from a hazard area.*

### **Property Protection Goal**

Grays Harbor County will seek to reduce the impact of hazards on the built environment whenever possible. It will place particular emphasis on actively safeguarding critical facilities in hazard prone areas to protect public health and safety.

### **Property Protection Objectives**

1. Promote the use of appropriate hazard resistant design, construction, and maintenance for all structures, both public and private.
2. Support programs that assist homeowners and businesses establish hazard mitigation measures on their property.
3. Develop hazard resistant protective measures for critical facilities and lifelines.
4. Encourage the retrofit of critical facilities in hazard areas to protect public health and safety.
5. Protect valuable historic and cultural resources.

## **Public Education and Awareness**

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*Public education and awareness seeks to inform and educate citizens, elected officials, and property owners about hazards and the potential ways to mitigate them.*

### **□ Public Education and Awareness Goal**

Grays Harbor County citizens, businesses, and visitors will be informed, prepared for, and recognize what actions to take during and after a hazard event.

### **◎ Public Education and Awareness Objectives**

1. Make available programs and information to assist residents, businesses, and visitors prepare for and recognize what actions to take during and after a hazard event.
2. Increase awareness of mitigation actions that reduce the impact of hazards.
3. Develop cooperative education and awareness programs with non-profit and private organizations that provide disaster programs.
4. Disseminate information to the public about specific emergency action plans and procedures.

## **Structural Projects**

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*Structural projects involve the construction of public infrastructure improvements to reduce the impacts of a hazard.*

### **□ Structural Projects Goal**

Support development of suitable structural projects that significantly reduce the impact of a hazard when no other option is feasible.

### **◎ Structural Projects Objectives**

1. Prioritize and secure funding for all structural projects identified in existing plans.
2. Identify and prioritize the need for new structural projects to increase protection of life, property, and the natural environment.

## **Emergency Services**

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*Emergency services protect people and property during and immediately after a disaster or hazard event.*

### **□ Emergency Services Goal**

Grays Harbor County will have sufficient expertise and resources for emergency preparedness, response, and recovery to reduce the loss of life and property damage due to hazard events. It will have a reliable communication system that will coordinate action between emergency responders, the public, and media outlets before, during, and after a hazard event. Furthermore, disaster events will not significantly disrupt county emergency operations and services.

### **◎ Emergency Services Objectives**

1. Provide for a well-trained group of professional and volunteer emergency personnel with the capability to effectively respond to hazard events.
2. Assure effective coordination with all local, state, and federal agencies during a hazard event.
3. Maintain a secure, dedicated emergency communication system with built in redundancy.
4. Minimize disruption to public facilities and services during a hazard event.

## **Natural Resource Protection**

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*Natural resource protection minimizes losses from hazard events through preserving or restoring the functions of natural systems.*

### **□ Natural Resource Protection Goal**

Grays Harbor County will promote natural resource protection that protects life and public safety.

### **◎ Natural Resources Protection Objectives**

1. Conserve and rehabilitate natural systems to serve hazard mitigation functions.

2. Advocate responsible “best management practices” for land development, recreational activities, and commercial operations to reduce damage or loss of natural resources.
3. Support effective natural resources of commercial significance and critical areas plans and regulations.

## Section 4

# Hazard Mitigation Actions and Implementation Strategies

Hazard Mitigation Actions are specific, concrete, stand-alone activities or projects that implement Hazard Objectives, which in turn attain Hazard Mitigation Goals. Each Hazard Mitigation Action also has an accompanying Hazard Mitigation Implementation Strategy that identifies responsibilities, timelines, and needed resources. Together, Hazard Mitigation Actions and Implementation Strategies are a “hands on” approach that makes Hazard Mitigation planning a reality for Grays Harbor County.

Grays Harbor County has identified two types of Hazard Mitigation Actions for this plan: Tier 1 and Tier 2 Hazard Mitigation Actions. The first type of Hazard Mitigation Actions consists of Tier 1 Actions that are eligible for funding under FEMA’s Hazard Mitigation Grant Program (HMGP).

Tier 2 Actions are not eligible for funding under HMGP but are important projects nonetheless for hazard mitigation in Grays Harbor County. Tier Two Actions, however, may be eligible for funding from other local, state, and federal programs.

### **Tier 1 Actions**

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**T1-1. Use existing bridge inspection data to prioritize and retrofit/replace county bridges to increase their resilience to hazard events.**

Lead Agency: Grays Harbor County Department of Public Services /Public Works Division

Supporting Agencies: Washington State Department of Transportation (WSDOT)

Projected Timeline: Every two years

Resources/Funding: State and federal grants and the County Road Fund

Other Comments: Support WSDOT projects that benefit the county, such as the Humptulips Bridge replacement

- T1-2. Distribute hazard mitigation information and publications published by FEMA, Washington State Emergency Management Division, Red Cross, Cooperative Extension Service, and other agencies and organizations to all public libraries and schools throughout the county to promote citizen commitment to hazard mitigation.**

Lead Agency: Grays Harbor County Emergency and Risk Management

Supporting Agencies: Citizen Corps, Planning and Building Division, Grays Harbor Conservation District, newspapers and radio stations, Fire Districts, telephone directories, cable television.

Projected Timeline: On-going

Resources/Funding: Staff time, grants, and local funding

Other Comments: The Emergency & Risk Management Division will need another full-time employee to coordinate this effort.

- T1-3a. Evaluate, prioritize, and retrofit county critical facilities in hazard areas to increase their resistance to hazard events.**

Lead Agency: Grays Harbor County Utilities and Development Division

Supporting Agencies: Grays Harbor County Department of Public Services /Facilities Services Division, hospitals, tenants of county-owned buildings, public water system purveyors, police departments,

Projected Timeline: Next one to five years

Resources/Funding: Grants and local capital funds

Other Comments: None

- T1-3b. Establish and maintain a coast-wide siren warning system with distinguishable tones coded to hazard event.**

Lead Agency: Washington State Emergency Management Division

Supporting Agencies: Grays Harbor County Department of Public Services /Emergency and Risk Management Division, National Oceanic and Atmospheric Administration (NOAA), cities, and Washington State Legislature.

Projected Timeline: Next one to five years

Resources/Funding: State and federal appropriations

Other Comments: State gradually is replacing older, existing units

**T1-3c. Work with WSDOT to augment current tsunami evacuation signs with safe elevation markers in key areas and signs painted directly on roadways.**

Lead Agency: Washington State Emergency Management Division

Supporting Agencies: Grays Harbor County Emergency and Risk Management Division, Grays Harbor County Public Works Division, and cities

Projected Timeline: Next two to three years

Resources/Funding: State, local staff time to install signs on county roads

Other Comments: EMD contact person is George Crawford, Earthquake Program Manager

**T1-4. Implement recommendations within the Vance Creek Drainage Evaluation and the South Coastal, North Beach, and Grays Harbor county Flood Hazard Management Plans.**

Lead Agency: Grays Harbor County Utilities and Development Division

Supporting Agencies:

Projected Timeline: Revise plans

Resources/Funding: Grants, local funding, local improvement districts (LID), loans, and assessments

Other Comments: Citizens are key to the success of any projects

**T1-5. Promote revisions to current FEMA floodplain maps.**

Lead Agency: Grays Harbor County Department of Public Services

Supporting Agencies: Washington Department of Ecology (WDOE), Federal Emergency Management Agency (FEMA), US Geologic Survey, Grays Harbor Conservation District, and US Army Corps of Engineers.

Projected Timeline: Next 1 to five years

Resources/Funding: County Geographic Information System staff time, and state and federal grants/program funding

**T1-6. Implement a home elevation and buyout program for repetitive loss properties in the Wynoochee, Satsop and Humptulips River Basins and the North and South Coast Areas as funding becomes available.**

Lead Agency: Grays Harbor County Utilities and Development and Planning and Building Divisions

Supporting Agencies: NeighborWorks® of Grays Harbor County

Projected Timeline: On-going

Resources/Funding: Grant funding

**T1-7. Establish a program in cooperation with fire districts, tribes, and private property owners that provide emergency public access to locked gated roads during hazard events and procedures for addressing traffic backups.**

Lead Agency: Grays Harbor County Emergency and Risk Management Division

Supporting Agencies: Law enforcement agencies, Grays Harbor County Department of Forestry and Tax Title Management, private timber companies, fire districts, and tribes

Projected Timeline: One to three years

Resources/Funding: Staff time, grants to purchase locks

Other Comments: For this program to be successful, a standardized locking system is essential. In addition, there is a need to determine who will have access.

**T1-8a. Work with the Washington State Department of Transportation, public and private utility providers and the Puget Sound and Pacific Railroad to implement a cooperative tree trimming and removal program along state highways, county road, utility corridors, and railways.**

Lead Agency: Grays Harbor County Public Works Division

Supporting Agencies: Grays Harbor Public Utility District (GHPUD), Puget Sound and Pacific Railroad, and WSDOT

Projected Timeline: Developing the cooperative agreement – next two to three years; tree trimming – on-going

Resources/Funding: Local funding for trimming

Other Comments: Prioritize areas; examine ability to be cost effective

- T1-8b. Have human services providers and volunteers check up on the elderly and special needs populations during hazard events to assure they have a safe source of heat and adequate food, water, and medications.**

Lead Agency: Senior Chore Services and Grays Harbor County Sheriff's Department

Supporting Agencies: Grays Harbor County Coastal Community Action Program, volunteers, churches, Red Cross

Projected Timeline: One to two years for initiating program, then on-going

Resources/Funding: Volunteer services

- T1-9. Encourage citizens and businesses to have access to the NOAA Weather Radio (NWR) service, including supporting efforts to purchase NWP receivers for low-income households as well as provide public information about using them effectively.**

Lead Agency: Grays Harbor County Emergency and Risk Management Division

Supporting Agencies: WSEMD, NOAA, Citizen Corps, and social service agencies

Projected Timeline: On-going

Resources/Funding: Volunteers and grants

Other Comments: Teach other citizens who are not of low-income where to acquire the radios

- T1-10. Encourage installation of utilities underground in new short plat, large lot subdivisions, and commercial developments and provide incentives for replacing above ground utilities with underground ones.**

Lead Agency: Grays Harbor County Planning and Building Division

Supporting Agencies: GHPUD, County Prosecutor

Projected Timeline: On-going after passage of ordinance; on-going grant application

Resources/Funding: Staff time for ordinance preparation,

## Tier 2 Actions

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**T2-1a. Actively search for grants and loans to fund hazard mitigation projects and programs in Grays Harbor County.**

Lead Agency: Grays Harbor County Emergency and Risk Management Division

Supporting Agencies: Grays Harbor County Utilities and Development Division, Grays Harbor Council of Governments

Projected Timeline: On-going

Resources/Funding: Local funding

Other Comments: A new full-time employee with the Emergency and Risk Management Division will be needed.

**T2-1b. Support the Public Health and Social Services Department to make information available on basic health problems and solutions during and after disasters, especially concerning water contamination and food spoilage.**

Lead Agency: Grays Harbor County Department of Public Health and Social Services

Supporting Agencies: Grays Harbor County Emergency and Risk Management Division

Projected Timeline: 1-2 years

Resources/Funding: Collect existing information, grant to develop new information and for outreach

**T2-2a. Set funding priorities for hazard mitigation projects annually based on urgency and need.**

Lead Agency: Grays Harbor County Utilities and Development Division

Supporting Agencies: Emergency Management Planning Committee, Grays Harbor County Emergency and Risk Management Division

Projected Timeline: Every five years

Resources/Funding: Staff time

Other Comments: Integrate Hazard Mitigation Projects into Capital Facilities Plan

- T2-2b. Establish interagency radio links between the Grays Harbor Emergency Operation Center, law enforcement agencies, fire districts, emergency medical services, the 911 call center, and state and federal agencies to ensure efficient and coordinated communication during hazard events.**

Lead Agency: Grays Harbor County Emergency Management Planning Committee

Supporting Agencies: Grays Harbor County Emergency and Risk Management Division, all participating jurisdictions

Projected Timeline: On-going

Resources/Funding: Federal and state grants, jurisdictional budgets

Other Comments: The State Interoperability Executive Committee (SEIC) sets guidelines

- T2-3a. Rate hazard mitigation projects needed to protect public safety as high priority in the county's Capital Improvement and Road Plans.**

Lead Agency: Grays Harbor County Utilities and Development Division

Supporting Agencies: Grays Harbor County Divisions of Emergency Management, Public Works, and Planning.

Projected Timeline: Every five years. The next update is scheduled to occur during 2005

Resources/Funding: Departmental budget

Other Comments: Project categories (i.e. stormwater and sewer) are not typically ranked against one another.

- T2-3b. Join the National Flood Insurance Community Rating System program.**

Lead Agency: Grays Harbor County Planning and Building Division

Supporting Agencies: Grays Harbor County Department of Public Works, Department of Ecology, Grays Harbor County Emergency and Risk Management Division

Projected Timeline: 1-2 years

Resources/Funding: Primarily current budget. Need supplemental funding for some of the outreach components.

Other Comments: Work currently underway

- T2-4. Create a Disaster Information Section on the Grays Harbor County Emergency Services Home Page with up-to-date information on: current storm watches and warnings; road closures; evacuation routes; shelter locations; emergency contacts; the Hazard Mitigation Planning; and an interactive comment tool.**

Lead Agency: Grays Harbor County Central Services Department

Supporting Agencies: Grays Harbor County Emergency and Risk Management Division, Red Cross, and churches

Projected Timeline: One to two years to establish (including comment), then on going

Resources/Funding: Staff time for WWW site development

Other Comments: Much of the information is already available, but some improvement may be necessary

- T2-5a. Research and maintain a list of grant and low-interest loan programs that assist homeowners and businesses undertake hazard mitigation projects.**

Lead Agency: Grays Harbor County Emergency and Risk Management Division

Supporting Agencies: NeighborWorks® of Grays Harbor County, CCAP

Projected Timeline: 2-3 years

Resources/Funding: Need supplemental funding

Other Comments: Check with supporting agencies, some of the work may already be done.

- T2-5b. Develop an agreement between Grays Harbor County and all municipal police departments, the Washington State Patrol, and the Washington State Department of Transportation that coordinates disaster evacuation efforts and traffic control protocols during accidents to allow by-pass routes for emergency equipment.**

Lead Agency: Grays Harbor County Sheriff's Department

Supporting Agencies: Grays Harbor County Emergency and Risk Management Division and the Board of County Commissioners

Projected Timeline:

Resources/Funding:

Other Comments:

**T2-6. Improve and maintain an effective Telephone Warning System.**

Lead Agency: Grays Harbor County Emergency and Risk Management Division

Supporting Agencies: All jurisdictions in Grays Harbor County, Stafford Creek Correctional Center, Grays Harbor County Central Services Department, and Grays Harbor PUD

Projected Timeline: Three to five years

Resources/Funding: Staff time to update the system

Other Comments: New software may be necessary

**T2-7. Develop partnerships with county school districts to teach children about weather watches and warnings, hazard mitigation, emergency actions, early release plans and emergency service providers.**

Lead Agency: Grays Harbor County Emergency and Risk Management Division

Supporting Agencies: School Districts of Aberdeen, Hoquiam, North Beach, Ocosta, Montesano, Satsop, Elma, McCleary, Oakville, Cosmopolis, North River, and Wishkah Valley, and state EM

Projected Timeline:

Resources/Funding: Need funding for an outreach coordinator

**T2-8. Develop a damage assessment program that includes ongoing training for assessment team personnel.**

Lead Agency: Grays Harbor County Emergency and Risk Management Division

Supporting Agencies: City and County Departments of Public Works, Building, ER & R, and Washington Emergency Management Division

Projected Timeline: 1-2 years

Resources/Funding: Grant

- T2-9a. Establish a protocol between County departments, state agencies, and all other providers of emergency services to assure consistency of public information provided during a disaster.**

Lead Agency: Grays Harbor County Emergency and Risk Management Division

Supporting Agencies: County Departments of Sheriff, Public Works, and Board of County Commissioners, fire districts, city law enforcement and fire Departments, E-911, Washington State Department of Transportation, and Washington State Emergency Management Division

Projected Timeline: 1-2 years

Resources/Funding: Annual budget appropriations

- T2-9b. Establish a protocol for controlled distribution of food, water, and medical services at specific sites during and/or immediately after a disaster.**

Lead Agency: Grays Harbor County Emergency and Risk Management Division

Supporting Agencies: Grays Harbor County Public Health and Social Services, Coastal Community Action Program, United Way, Red Cross Grays Harbor Chapter

Projected Timeline: 2-3 years

Resources/Funding: Part of the current budget as a Comprehensive Plan component

- T2-9c. Make available to first responders a current list of citizens on life support, who are homebound with special needs, and elderly populations for emergency response and/or rescue during a hazard event.**

Lead Agency: Grays Harbor County Emergency and Risk Management Division

Supporting Agencies: Community and Mark Reed Hospitals, service providers such as Lincare, or AARO Medical Supplies, Home Health care providers such as Hospice, Catholic Community Services.

Projected Timeline: 2-3 years

Resources/Funding: Outside funding from one of the supporting agencies

**T2-10a. Provide the public with information on the proper use of 911 during a hazard event using such tools as telephone books, bookmarks for school children, and posters in public buildings.**

Lead Agency: Grays Harbor County Emergency and Risk Management Division

Supporting Agencies: E-911, school districts, and fire and police departments

Projected Timeline: 1-2 years

Resources/Funding: Current education budget allocation augmented through grant for outreach

**T2-10b. Develop post-disaster debris dumping sites in a representative number of locations throughout the county, including an evaluation of the sites for conformance with Title 17 of the Grays Harbor Code.**

Lead Agency: Grays Harbor County Utilities and Development Division

Supporting Agencies: Grays Harbor County Emergency and Risk Management Division and Board of County Commissioners

Projected Timeline: 2-3 years

Resources/Funding: Part of the Disaster Contingency Fund or disaster relief dollars upon declaration of a disaster

**T2-11a. Support development of sub-area plans for local communities and neighborhoods in remote areas that identify coordinators and resources to assist with hazard mitigation, disaster responses, and recovery.**

Lead Agency: Grays Harbor County Emergency and Risk Management Division

Supporting Agencies: Law Enforcement, Fire Districts, and Washington State Emergency Management Division

Projected Timeline: 1-3 year

Resources/Funding: Grants for outreach

Other Comments: Need to establish an outreach coordinator position

**T2-11b. Establish and maintain a disaster contingency fund within the Grays Harbor County budget.**

Lead Agency: Grays Harbor County Department of Public Services

Supporting Agencies: Grays Harbor County Emergency and Risk Management Division and Board of County Commissioners

Projected Timeline: 1-2 years

Resources/Funding: County budget allocations

**T2-12a. Organize and keep current a central database listing the equipment needs of all emergency services providers in Grays Harbor County to make the public aware of needs and facilitate cooperative funding opportunities.**

Lead Agency: Grays Harbor County Emergency and Risk Management Division

Supporting Agencies: Grays Harbor County and city departments, fire districts, and law enforcement

Projected Timeline: 1-2 years

Resources/Funding: Current budget as part of Comprehensive Plan

**T2-12b. Work with School Districts to secure satellite phones in all school buses that regularly transport children in or through tsunami inundation zones.**

Lead Agency: Grays Harbor County Emergency and Risk Management Division

Supporting Agencies: Grays Harbor County Equipment Rental and Revolving Fund (radio shop), School Districts

Projected Timeline: 1-2 years

Resources/Funding: Funded through school district emergency preparedness

**T2-13. Establish a Memorandum of Agreement with Pacific County and the Shoalwater Tribe for cooperative mitigation plans and actions for the South Beach area.**

Lead Agency: Grays Harbor County Board of County Commissioners

Supporting Agencies: Grays Harbor County Emergency and Risk Management Division, Pacific County and the Shoalwater Tribe

Projected Timeline: 1-3 years

Resources/Funding: Current budget as part of Comprehensive Plan

A summary table of Tier 1 and 2 Mitigation Actions by hazard follows on the next five pages.

**Table 7  
Tier 1 Mitigation Actions by Hazard**

<b>Rank</b>	<b>Tier 1 Actions</b>	<b>Flood</b>	<b>Earthquake</b>	<b>Wind Storm</b>	<b>Tsunami</b>	<b>Winter Storm</b>	<b>Landslide</b>	<b>Hazard Materials Incidents</b>	<b>Volcano</b>	<b>Wildland Fire</b>	<b>Tornado</b>
<b>1</b>	Use existing bridge inspection data to prioritize and retrofit/replace county bridges to increase their resilience to hazard events.	●	●		●						
<b>2</b>	Distribute hazard mitigation information and publications published by FEMA, Washington State Emergency Management Division, Red Cross, Cooperative Extension Service, and other agencies and organizations to all public libraries and schools throughout the county to promote citizen commitment to hazard mitigation.	●	●	●	●	●	●	●	●	●	●
<b>3A</b>	Evaluate, prioritize, and retrofit county critical facilities in hazard areas to increase their resistance to hazard events.	●	●	●	●	●	●	●	●	●	●
<b>3B</b>	Establish and maintain a coast-wide siren warning system with distinguishable tones coded to hazard event.			●	●	●				●	
<b>3C</b>	Work with WSDOT to augment current tsunami evacuation signs with safe elevation markers in key areas and signs painted directly on roadways.				●						
<b>4</b>	Complete structural measures listed in the Vance Creek Drainage Evaluation and the South Coastal, North Beach, and Grays Harbor county Flood Hazard Management Plan	●				●					
<b>5</b>	Promote the need for any revisions to current FEMA floodplain maps.	●									
<b>6</b>	Implement a home elevation and buyout program for repetitive loss properties in the Wynoochee, Satsop and Humptulips River Basins and the North and South Coast Areas as funding becomes available.	●									
<b>7</b>	Establish a program in cooperation with fire districts, tribes, and private property owners that provides emergency public access to locked gated roads during hazard events and procedures for addressing traffic backups.				●						

<b>Rank</b>	<b>Tier 1 Actions</b>	<b>Flood</b>	<b>Earthquake</b>	<b>Wind Storm</b>	<b>Tsunami</b>	<b>Winter Storm</b>	<b>Landslide</b>	<b>Hazard Materials Incidents</b>	<b>Volcano</b>	<b>Wildland Fire</b>	<b>Tornado</b>
<b>8A</b>	Work with the Washington State Department of Transportation, public and private utility providers and the Puget Sound and Pacific Railroad to implement a cooperative tree trimming and removal program along state highways, county road, utility corridors, and railways.			●		●					
<b>8B</b>	Have human services providers and volunteers check up on the elderly and special needs populations during hazard events to assure they have a safe source of heat and adequate food, water, and medications	●				●		●			
<b>9</b>	Encourage citizens and businesses to have access to the NOAA Weather Radio (NWR) service, including supporting efforts to purchase NWP receivers for low-income households as well as provide public information about using them effectively.	●		●	●	●					●
<b>10</b>	Encourage installation of utilities underground in new short subdivisions, subdivisions, and commercial developments and provide incentives for replacing above ground utilities with underground ones.			●		●					

**Table 8  
Tier 2 Mitigation Actions**

<b>Rank</b>	<b>Tier 2 Mitigation Actions</b>	<b>Flood</b>	<b>Earthquake</b>	<b>Wind Storm</b>	<b>Tsunami</b>	<b>Winter Storm</b>	<b>Landslide</b>	<b>Hazard Materials Incidents</b>	<b>Volcano</b>	<b>Wildland Fire</b>	<b>Tornado</b>
<b>1A</b>	Actively search for grants and loans to fund hazard mitigation projects and programs in Grays Harbor County.	●	●	●	●	●	●	●	●	●	●
<b>1B</b>	Support the Public Health and Social Services Department to make information available on basic health problems and solutions during and after disasters, especially concerning water contamination and food spoilage.	●	●	●	●	●			●		
<b>2A</b>	Set funding priorities for hazard mitigation projects annually based on urgency and need.	●	●	●	●	●	●	●	●	●	●
<b>2B</b>	Establish interagency radio links between the Grays Harbor Emergency Operation Center, law enforcement agencies, fire districts, emergency medical services, the 911 call center, and state and federal agencies to ensure efficient and coordinated communication during hazard events.	●	●	●	●	●	●	●	●	●	●
<b>3A</b>	Rate hazard mitigation projects needed to protect public safety as high priority in the county's Capital Improvement and Road Plans.	●	●	●	●	●	●	●	●	●	●
<b>3B</b>	Join the National Flood Insurance Community Rating System program	●									
<b>4A</b>	Create a Disaster Information Section on the Grays Harbor County Emergency Services Home Page with up-to-date information on: current storm watches and warnings; road closures; evacuation routes; shelter locations; emergency contacts; the Hazard Mitigation Planning; and an interactive comment tool.	●	●	●	●	●	●	●	●	●	●
<b>4B</b>	Review and incorporate, as appropriate, action items and projects from the Chehalis River Basin Project.	●									

<b>Rank</b>	<b>Tier 2 Mitigation Actions</b>	<b>Flood</b>	<b>Earthquake</b>	<b>Wind Storm</b>	<b>Tsunami</b>	<b>Winter Storm</b>	<b>Landslide</b>	<b>Hazard Materials Incidents</b>	<b>Volcano</b>	<b>Wildland Fire</b>	<b>Tornado</b>
<b>5A</b>	Research and maintain a list of grant and low-interest loan programs that assist homeowners and businesses undertake hazard mitigation projects.	●	●	●	●	●	●	●	●	●	●
<b>6</b>	Improve and maintain an effective Telephone Warning System	●	●	●	●	●	●	●	●	●	●
<b>7</b>	Develop partnerships with county school districts to teach children about weather watches and warnings, hazard mitigation, emergency actions, early release plans and emergency service providers.	●	●	●	●	●	●	●	●	●	●
<b>8</b>	Develop a damage assessment program that includes ongoing training for assessment team personnel.	●	●	●	●	●	●	●	●	●	●
<b>9A</b>	Establish a protocol between County departments, state agencies, and all other providers of emergency services to assure consistency of public information provided during a disaster.	●	●	●	●	●	●	●	●	●	●
<b>9B</b>	Establish a protocol for controlled distribution of food, water, and medical services at specific sites during and/or immediately after a disaster.	●	●	●	●	●	●	●	●	●	●
<b>9C</b>	Make available to first responders a current list of citizens on life support, who are homebound with special needs, and elderly populations for emergency response and/or rescue during a hazard event.	●	●	●	●	●	●	●	●	●	●
<b>10A</b>	Provide the public with information on the proper use of 911 during a hazard event using such tools as telephone books, bookmarks for school children, and posters in public buildings.	●	●	●	●	●	●	●	●	●	●
<b>10B</b>	Develop post-disaster debris dumping sites in a representative number of locations throughout the county, including an evaluation of the sites for conformance with Title 17 of the Grays Harbor Code.	●	●	●	●	●	●	●	●	●	●
<b>11A</b>	Support development of sub-area plans for local communities and neighborhoods in remote areas that identify coordinators and resources to assist with hazard mitigation, disaster responses, and recovery.	●	●	●	●	●	●	●	●	●	●
<b>11B</b>	Establish and maintain a disaster contingency fund within the Grays Harbor County budget.	●	●	●	●	●	●	●	●	●	●

<b>Rank</b>	<b>Tier 2 Mitigation Actions</b>	<b>Flood</b>	<b>Earthquake</b>	<b>Wind Storm</b>	<b>Tsunami</b>	<b>Winter Storm</b>	<b>Landslide</b>	<b>Hazard Materials Incidents</b>	<b>Volcano</b>	<b>Wildland Fire</b>	<b>Tornado</b>
<b>12A</b>	Organize and keep current a central database listing the equipment needs of all emergency services providers in Grays Harbor County to make the public aware of needs and facilitate cooperative funding opportunities.	●	●	●	●	●	●	●	●	●	●
<b>12B</b>	Work with School Districts to secure satellite phones in all school buses that regularly transport children in or through tsunami inundation zones.				●						
<b>13</b>	Establish a Memorandum of Agreement with Pacific County and the Shoalwater Tribe for cooperative mitigation plans and actions for the South Beach area.	●	●	●	●	●	●	●	●	●	●

## Section 5

# Strategies for Economic Analysis of Mitigation Actions

### Using Economic Analysis for Mitigation Actions

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The Mitigation Actions proposed in this plan represent the initial policy planning efforts of Grays Harbor County in minimizing the threats posed by natural hazards to life and property. Over the next five years, the county will continue to flesh out further detail on each Mitigation Action before fully committing to its implementation. Part of this design process entails conducting a thorough economic analysis of each Mitigation Action to ensure achieving the greatest benefit to the community.

There are two basic tools available to the county for conducting economic analyses of Mitigation Actions. Benefit/cost analysis is one such model for evaluating the economic benefits of a mitigation action in protecting life and property from natural hazards. It reveals whether or not a particular action is economically worthwhile to take action before or after a hazard event. The standard measure in benefit/cost analysis is dollars and a project must show a benefit/cost ratio of greater than one to show positive affect from an action taken. As an example, benefit/cost analysis can look at whether the cost of retrofitting a bridge before an earthquake happens is less expensive than fully replacing it if destroyed. In the case of bridges, the literature indicates that retrofitting a bridge generally costs \$32 a square foot while its replacement value is \$135 a square foot – a positive benefit/cost ratio of 4.2 to 1.

Some further examples of calculating economic return for Mitigation Actions include:

- Building and infrastructure damages avoided
- Content damages avoided
- Inventory damages avoided
- Rental income losses avoided
- Relocation and disruption expenses avoided
- Proprietor's income losses avoided

A second tool is cost-effectiveness analysis, which evaluates the best way to spend a given amount of money to achieve a specific goal. The premise behind this method considers how effective an approach is over the long-term given its cost. For instance, an analysis of two Mitigation Actions might show greater long-term public acceptance of a more expensive action over a cheaper one. Other similar efficacy tests might be:

- Ease of implementation
- Impact to threatened and endangered species
- Aesthetic values
- Impact to social structures, such as age, race, or ethnicity

This type of analysis may not necessarily entail measuring costs and benefits in terms of dollars or any other common measurements. However, assigning value to such non-monetary considerations allows for more a thorough consideration of alternatives.

Grays Harbor County intends to use a mix of both benefit/cost and cost-effectiveness analyses when completing the design of Mitigation Actions or when determining their value in implementation. For larger projects, application of these two methods can be quite complex at times and may require assistance of experts within the economic analysis field. In general, however, the guidelines below reflect how the county intends to approach economic analyses for Mitigation Actions during its decision-making processes.

## **Economic Analysis Guidelines for Mitigation Actions**

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### **Step 1     Generating Alternatives**

The responsible Lead Agency for a Mitigation Action will generate a series of alternatives for consideration, including a “no action” scenario. Public participation is an essential element in identifying appropriate alternatives during this phase.

### **Step 2     Calculating Costs, Benefits, and Effectiveness**

The lead agency will perform a thorough economic analysis for each alternative that covers a wide range of criteria. This entails:

- Determining the project cost, which includes development costs as well as operation and maintenance costs over time

- Comparing the future economic return of the mitigation action against the risk assessment
- Considering the costs and benefits to society and the environment, using both qualitative and quantitative data

### Step 3 Analyzing and Ranking Alternatives

This step compares and contrasts the analyses conducted in Step 2. The outcome from this effort is a prioritized list of alternatives. Regardless of the outcome of the ranking, projects must match the funding resources available. The Board of County Commissioners is the responsible body for selecting the appropriate alternative to implement.

## Section 6

# Plan Maintenance Procedures

Regular plan maintenance ensures that the Hazard Mitigation Plan remains a relevant document for protecting life and property within Grays Harbor County. This section presents an overview of the process as to how Grays Harbor County will monitor, evaluate, and update the plan.

### **Adoption**

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The Grays Harbor County Board of County Commissioners is the responsible body for adopting the Hazard Mitigation Plan. This document will serve as the county's five-year public policy statement in guiding hazard mitigation activities within the jurisdictional responsibilities of Grays Harbor County.

Before its formal adoption by resolution by the Board of Commissioners, the initial plan must undergo review by the Washington State Emergency Management Division (EMD) and the Federal Emergency Management Agency (FEMA) to determine if it meets established criteria for hazard mitigation planning. Once EMD and FEMA accept the plan, Grays Harbor County will be eligible for participation in the Hazard Mitigation Grant Program (HMGP).

### **The Plan Monitoring and Maintenance Process**

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The Board of County Commissioners (BOCC) relies on the assistance of the Grays Harbor County Local Emergency Planning Committee (LEPC) in monitoring and maintaining the Hazard Mitigation Plan. The LEPC does this through an annual review process and if necessary, forwarding recommendations relevant to the plan for BOCC consideration and action. Coordinating this effort for the LEPC is the Deputy Director for the Emergency and Risk Management Division.

Assisting the LEPC in this task is the Hazard Mitigation Planning Team (HMPT). The HMPT serves as a subcommittee to the LEPC by acting as their "hazard mitigation planning specialists." The Board of County Commissioners appoints 17 members to the group consisting of people from local emergency management agencies and organizations, representatives from private industry, as well as citizens. The Director for the Emergency and Risk Management Division, who also serves as a member, coordinates this process for the HMPT.

The HMPT initiates its monitoring and maintenance of the Hazard Mitigation Plan in June of each year. “Monitoring” the plan entails the HMPT annually reviewing and evaluating:

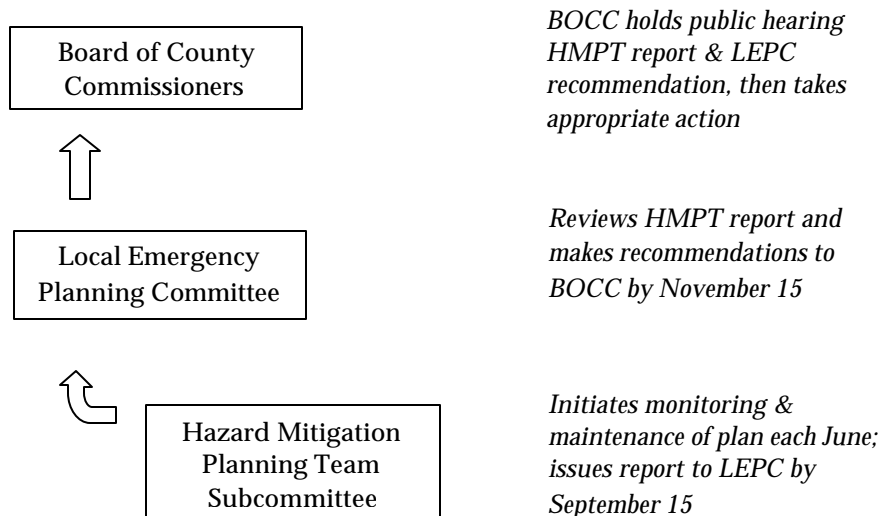
- The validity or current relevance of the planning data within Part 4 of this plan;
- How changes in the planning data affect the Goals, Objectives, and Mitigation Actions; and
- The extent of progress made in achieving each Mitigation Action in accordance with its accompanying Implementation Strategy.

“Maintenance” comes into play if the annual review and evaluation process reveals the need for making changes to the Hazard Mitigation Plan. If so, the HMPT forwards its recommendations in a report to the LEPC by September 15. The LEPC examines the HMPT report and assesses it in context with the overall Comprehensive Emergency Management Plan (CEMP). The LEPC then forwards the HMPT report to the BOCC along with its recommendations and/or comments by November 15.

The BOCC reviews the HMPT report and LEPC recommendations, and then holds a public hearing on the report. Once receiving public comment and making appropriate amendments as needed, the BOCC adopts the revised Hazard Mitigation Plan.

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**Figure 1**  
**Plan Monitoring and Maintenance Process**



## **Continuing Citizen Participation and Involvement**

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On-going citizen participation is essential for keeping citizens involved in and supportive of hazard mitigation after completion of the plan. Along with its plan monitoring and maintenance duties, it is also the responsibility of the HMPT to work with the Emergency and Risk Management Division to keep hazard mitigation in the public's mind by:

- Securing more resources to continue public education about hazard mitigation
- Participating in National Emergency Preparedness every April
- Participating in Tsunami Awareness every September
- Having a hazard mitigation display annually at the Grays Harbor County Fair and other community events
- Distributing brochures on hazard mitigation for families through the school districts, the Department of Health and Social Services, GH PUD billings, Community Hospital, food banks, and other public places
- Maintaining a hazard mitigation display/kiosk at the Pearsall Building
- Having an interactive hazard mitigation web site with public comment capabilities