

**RESOLUTION NO. 14-15**

**A RESOLUTION OF THE SCAPPOOSE CITY COUNCIL ADOPTING THE UPDATED  
COLUMBIA COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN  
FOR THE CITY OF SCAPPOOSE**

**WHEREAS**, the Federal Emergency Management Agency (FEMA) requires municipalities to adopt Hazard Mitigation Plans in order to be eligible for FEMA funding in the event of future disasters; and

**WHEREAS**, the City of Scappoose adopted a Hazard Mitigation Plan through Resolution No. 09-13; and

**WHEREAS**, the City of Scappoose, Columbia County, and other county municipalities have since updated the Hazard Mitigation Plan; and

**WHEREAS**, the Columbia County Multi-Jurisdictional Hazard Mitigation Plan for the City of Scappoose, attached hereto as Exhibit A, has been reviewed by residents, business owners, and federal, state, and local agencies and has been revised to reflect their concerns.

**NOW, THEREFORE, THE CITY OF SCAPPOOSE COUNCIL RESOLVES AS FOLLOWS:**

Section 1: The Columbia County Multi-Jurisdictional Hazard Mitigation Plan for the City of Scappoose, attached hereto as Exhibit A, is hereby adopted as an official plan of the City of Scappoose.


Section 2: Resolution No. 09-13 is hereby rescinded and replaced.

**PASSED AND ADOPTED** by the City Council of Scappoose and signed by me, and the City Recorder in authentication of its passage this 7<sup>th</sup> day of July, 2014.

**CITY OF SCAPPOOSE, OREGON**

  
\_\_\_\_\_  
Scott Burge, Mayor

Attest:

  
\_\_\_\_\_  
Susan M. Reeves, MMC, City Recorder

This appendix contains the specific City of Scappoose information to support the Columbia County Multi-Jurisdictional Hazard Mitigation Plan update.

This section further supports the County’s planning process by summarizing the review and incorporation of existing plans, studies, and reports used to develop this MHMP.

**DMA 2000 Requirements: Planning Process**

**Multi-Jurisdictional Planning Participation**

**Requirement §201.6(a)(3):** Multi-jurisdictional plans (e.g., watershed plans) may be accepted, as appropriate, as long as each jurisdiction has participated in the process ... Statewide plans will not be accepted as multi-jurisdictional plans.

**Element**

- Does the new or updated plan describe how each jurisdiction participated in the plan’s development?
- Does the updated plan identify all participating jurisdictions, including new, continuing, and the jurisdictions that no longer participate in the plan?

**Planning Process**

**Requirement §201.6(b):** An open public involvement process is essential to the development of an effective plan.

**Documentation of the Planning Process**

**Requirement §201.6(b):** In order to develop a more comprehensive approach to reducing the effects of natural disasters, the planning process shall include:

**Element**

- An opportunity for the public to comment on the plan during the drafting stage and prior to plan approval;
- An opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, and agencies that have the authority to regulate development, as well as businesses, academia, and other private and nonprofit interests to be involved in the planning process; and
- Review and incorporation, if appropriate, of existing plans, studies, reports, and technical information.

**Requirement §201.6(c)(1):** [The plan shall document] the planning process used to develop the plan, including how it was prepared, who was involved in the process, and how the public was involved.

**Element**

- Does the plan provide a narrative description of the process followed to prepare the new or updated plan?
- Does the new or updated plan indicate who was involved in the planning process? (For example, who led the development at the staff level and were there any external contributors such as contractors? Who participated on the plan committee, provided information, reviewed drafts, etc.?)
- Does the new or updated plan indicate how the public was involved? (Was the public provided an opportunity to comment on the plan during the drafting stage and prior to the plan approval?)
- Does the new or updated plan discuss the opportunity for neighboring communities, agencies, businesses, academia, nonprofits, and other interested parties to be involved in the planning process?
- Does the planning process describe the review and incorporation, if appropriate, of existing plans, studies, reports, and technical information?
- Does the updated plan document how the planning team reviewed and analyzed each section of the plan and whether each section was revised as part of the update process?

Source: FEMA, July 2008.

The City of Scappoose is dedicated to mitigating potential natural and technological hazard threats to its population and infrastructure. To fulfill that goal, the City organized a Hazard Mitigation Plan development Steering Committee dedicated to identifying hazard threats and developing actions to mitigate damage and life losses from those threats.

Table G-1 contains the City’s Steering Committee participant list to augment the Columbia County MHMP planning elements.

<b>Table G-1. City of Scappoose Steering Committee</b>	
Member	Position
Brian Varricchione	City Planner
Norm Miller	Interim Police Chief
Don Sallee	Building Official
Mike Greisen	Fire Chief

Table G-2 contains the summary of the City’s public involvement and planning meeting activities.

<b>Table G-2. City of Scappoose Public Involvement Mechanisms</b>	
Mechanism	Description
April 10, 2014 Countywide Public Meeting, 10 a.m. Columbia 911 Center, St Helens, OR	Columbia County Presented draft risk assessment results and provided opportunity to comment.
April 23, 2014 City public meeting, 9:30 a.m. at Scappoose CDC building	Present draft risk assessment results and provided opportunity to comment.
May 19, 2014 Public Hearing	Public meeting at the City Council Meeting to discuss plan contents
City of Scappoose website <a href="http://www.ci.scappoose.or.us">www.ci.scappoose.or.us</a>	The City of Scappoose will place a copy of the public input form on the City’s website.
City of Scappoose website <a href="http://www.ci.scappoose.or.us">www.ci.scappoose.or.us</a>	The City of Scappoose will place a copy of the Hazard Mitigation plan on the City’s website.

**CAPABILITY ASSESSMENT**

Table G-3, G-4, and G-5 contain the City’s resources used to support planning activities, including the reports and studies reviewed as part of the update process.

<b>Table G-3. City of Scappoose Legal and Regulatory Resources Available for Hazard Mitigation</b>		
<b>Regulatory Tool</b>	<b>Name</b>	<b>Effect on Hazard Mitigation</b>
Plans	Emergency Operations Plan (2002) Updated (2008)	Identifies emergency planning, policies, procedures, and response to extraordinary emergency situations associated with natural disasters, technological incidents, and national security emergencies.
	Comprehensive Plan (1991)	Location of future growth by classification
	Transportation Plans	Defines transportation infrastructure and delineates problem areas. Street layout incorporated.
	Water and Sewer Plan	Defines water and sewer infrastructure
	Storm Water Plans	Defines storm water management process
	Floodplain Management Plan	CRS community, has CRS rating of “7” for reduced insurance premium costs to participants
	Scappoose Comprehensive Urban Forestry Management Plan: Street Trees	Defines forestry management plan and long-term potential for future development
	Business Plan	Defines future goals for the community
Programs	National Flood Insurance Program (NFIP)	Makes affordable flood insurance available to homeowners, business owners, and renters in participating communities. In exchange, those communities must adopt and enforce minimum floodplain management regulations to reduce the risk of damage from future floods.
Policies (Municipal Codes)	Scappoose Municipal Code of Ordinances	Floodplain, steep slope, cut and fill regs-All development regulated by the code. Includes Floodplain ordinances
	Current State Building Code	Seismic standards-updates regularly
	City of Scappoose Charter of 2011	Identifies city boundaries, governance, and plan and project approval process

<b>Table G-4. City of Scappoose Administrative and Technical Resources for Hazard Mitigation</b>	
<b>Staff/Personnel Resources</b>	<b>Department/Division Position</b>
Planner(s) or engineer(s) with knowledge of land development and land management practices	City Engineer-Gordon Munro (contract-with Kennedy Jenks) City Planner- - Staff
Engineer(s) or professional(s) trained in construction practices related to buildings and/or infrastructure	City Engineer-Munro (contract) - Infrastructure and Building Official (Don Sallee-Staff) - Buildings
Planner(s) or engineer(s) with an understanding of manmade or natural hazards	City Engineer-Munro (contract) - Infrastructure and Building Official (Don Sallee-Staff) –Planner (Staff)
Floodplain manager	City Planner- - Staff
Personnel skilled in GIS and/or HAZUS-MH	City Planner
Director of Emergency Services	Local EOM-City Manager, Incident commander; ( Police Chief) (Fire Chief) alternate or situational ICs
Finance (grant writers, purchasing)	City Manager and Jill Herr-Finance Administrator City of Scappoose
Public Information Officers	City Manager

<b>Table G-5. City of Scappoose Financial Resources for Hazard Mitigation</b>	
<b>Financial Resources</b>	<b>Effect on Hazard Mitigation</b>
General funds	Yes
Authority to levy taxes for specific purposes	Yes w/ voter approval
Incur debt through general obligation bonds	Yes
Incur debt through special tax and revenue bonds	Yes
Incur debt through private activity bonds	No
Hazard Mitigation Grant Program (HMGP)	FEMA funding which is available to local communities after a Presidentially-declared disaster. It can be used to fund both pre- and post-disaster mitigation plans and projects.
Pre-Disaster Mitigation (PDM) grant program	FEMA funding which is available on an annual basis. This grant can only be used to fund pre-disaster mitigation plans and projects only.
Flood Mitigation Assistance (FMA) grant program	FEMA funding which is available on an annual basis. This grant can be used to mitigate repetitively flooded structures and infrastructure to protect repetitive flood structures.
United States Fire Administration (USFA) Grants	The purpose of these grants is to assist state, regional, national or local organizations to address fire prevention and safety. The primary goal is to reach high-risk target groups including children, seniors and firefighters.
Fire Mitigation Fees	Finance future fire protection facilities and fire capital expenditures required because of new development within Special Districts.

## HAZARD IDENTIFICATION AND SCREENING

The following section defines hazard identification as stipulated in DMA 2000 and its implementing regulations.

**DMA 2000 Requirements: Risk Assessment: Identifying Hazards**

**Identifying Hazards**  
**Requirement §201.6(c)(2)(i):** [The risk assessment shall include a] description of the type of all natural hazards that can affect the jurisdiction.  
**Element**  
 ■ Does the new or updated plan include a description of the types of all natural hazards that affect the jurisdiction?  
 Source: FEMA, July 2008.

The City of Scappoose’s Steering Committee determined that the following hazards could potentially threaten the community.

<b><i>Natural Hazards</i></b>	
Flood	X
Winter Storm	X
Landslide	X
Fire (Wildland/Urban)	X
Earthquake	X
Volcano	X
Wind	X
Erosion	X
ENSO (El Niño / La Niña)	X
Expansive Soils	
Drought	X
<b><i>Technological Hazards</i></b>	
Dam Failure	X
Disruption of Utility and Transportation Systems (DUTS)	X
Hazardous Materials	X
Terrorism	X
Infectious Disease Epidemic	X

## OVERVIEW OF VULNERABILITY ANALYSIS

This section summarizes community specific vulnerability information for the City of Scappoose to augment the MHMP development process. It comprises:

- An identification of the types and numbers of existing vulnerable buildings, infrastructure, and critical facilities and, if possible, the types and numbers of vulnerable future development.
- Estimate of potential dollar losses to vulnerable structures and the methodology used to prepare the estimate.
- Assess each jurisdiction's risks where they vary from the risks facing the entire planning area.

The following section defines vulnerability analysis as stipulated in DMA 2000 and its implementing regulations.

**DMA 2000 Requirements: Risk Assessment, Assessing Vulnerability, Overview**

**Assessing Vulnerability: Overview**

**Requirement §201.6(c)(2)(ii):** [The risk assessment shall include a] description of the jurisdiction's vulnerability to the hazards described in paragraph (c)(2)(i) of this section. This description shall include an overall summary of each hazard and its impact on the community.

**Element**

- Does the new or updated plan include an overall summary description of the jurisdiction's vulnerability to each hazard?
- Does the new or updated plan address the impact of each hazard on the jurisdiction?

Source: FEMA, July 2008.

**DMA 2000 Requirements: Risk Assessment, Assessing Vulnerability, Addressing Repetitive Loss Properties**

**Assessing Vulnerability: Addressing Repetitive Loss Properties**

**Requirement §201.6(c)(2)(ii):** [The risk assessment] must also address National Flood Insurance Program (NFIP) insured structures that have been repetitively damaged by floods.

**Element**

- Does the new or updated plan describe vulnerability in terms of the types and numbers of repetitive loss properties located in the identified hazard areas?

**DMA 2000 Recommendations: Risk Assessment, Assessing Vulnerability, Identifying Structures**

**Assessing Vulnerability: Identifying Structures**

**Requirement §201.6(c)(2)(ii)(A):** The plan should describe vulnerability in terms of the types and numbers of existing and future buildings, infrastructure, and critical facilities located in the identified hazard area.

**Element**

- Does the new or updated plan describe vulnerability in terms of the types and numbers of existing buildings, infrastructure, and critical facilities located in the identified hazard areas?
- Does the new or updated plan describe vulnerability in terms of the types and numbers of future buildings, infrastructure, and critical facilities located in the identified hazard areas?

Source: FEMA, July 2008.

The City of Scappoose actively participates in FEMA's National Flood Insurance Program (NFIP) and has implemented floodplain policies, regulations, and ordinances to protect their threatened population and infrastructure to assure NFIP compliance.

The City’s Mitigation Strategy identified and analyzed potential flood mitigation actions that would fulfill NFIP initiatives, specifically addressing repetitive loss (RL) properties to assure an effective flood mitigation program. They subsequently selected and prioritized County or community appropriate actions to assure an effective flood mitigation program.

**DMA 2000 Recommendations: Risk Assessment, Assessing Vulnerability, Estimating Potential Losses**

**Assessing Vulnerability: Estimating Potential Losses**  
**Requirement §201.6(c)(2)(ii)(B):** [The plan should describe vulnerability in terms of an] estimate of the potential dollar losses to vulnerable structures identified in paragraph (c)(2)(i)(A) of this section and a description of the methodology used to prepare the estimate.  
**Element**

- Does the new or updated plan estimate potential dollar losses to vulnerable structures?
- Does the new or updated plan describe the methodology used to prepare the estimate?

Source:

**DMA 2000 Recommendations: Multi-Jurisdictional Risk Assessment**

**Assessing Vulnerability: Multi-Jurisdictional Risk Assessment**  
**Requirement §201.6(c)(2)(iii):** For multi-jurisdictional plans, the risk assessment must assess each jurisdiction’s risks where they vary from the risks facing the entire planning area  
**Element**

- Does the new or updated plan include a risk assessment for each participating jurisdiction as needed to reflect unique or varied risks?

Source: FEMA, July 2008.

## **VULNERABILITY ANALYSIS: SPECIFIC STEPS**

### **Asset Inventory**

Asset inventory is the first step of a vulnerability analysis. Assets within each community that may be affected by hazard events include population, residential and nonresidential buildings, critical facilities, and infrastructure.

The asset inventory delineates the City’s existing building and infrastructure assets and insured values and are identified in detail in Tables G-6A, G-6B and G-7.

Tables G-8, G-9, and G-10 portray the City’s critical infrastructure numbers and values, and their potential vulnerability by hazard type.

The City of Scappoose seeks to protect its population by supporting Columbia County and Oregon State initiatives, ordinances, building codes, and development regulations. One of the most important initiatives is to prohibit or not allow future development of buildings, infrastructure and critical facilities in identified high hazard areas. Any essential infrastructure component will undergo stringent review to ensure potential hazard risk will be mitigated.

### **Population and Building Stock**

Population data listed in Table G-6A were obtained from the 2010 U.S. Census, UGB report and Portland State University. It comprises census block level data, and estimates from university conducted community research.

The City’s existing building and infrastructure and insured values are identified in Tables G-6A, G-6B, and G-7.



<b>Table G-6A. City of Scappoose Estimated Population and Building Inventory</b>				
<b>Population</b>			<b>Residential Buildings</b>	
<b>2010 Census</b>	<b>Estimated 2013 Census</b>	<b>Estimated 2015 Census<sup>2</sup></b>	<b>Total Building Count</b>	<b>Total Value of Buildings (\$)<sup>1</sup></b>
6,592	6,700	6,971	2,256	509,082,743.

**Source:** FEMA HAZUS-MH, Version 2006 and U.S. Census 2000.

<sup>1</sup> Average insured structural value of all residential buildings (including single-family dwellings, mobile homes, etc., is \$150,700 per structure).

<sup>2</sup> Portland State University (PSU) 2007 Oregon Population Report.

<b>Table G-6B. City of Scappoose NFIP Insurance Report</b>								
<b>City of</b>	<b>Total Premiums (\$)</b>	<b>Policies A-Zone</b>	<b>Total Policies</b>	<b>Total Coverage (\$)</b>	<b>Average Premium (\$)</b>	<b>Total Claims Since 1978</b>	<b>Total Paid Since 1978 (\$)</b>	<b>Rep Loss Properties<sup>2</sup></b>
Scappoose	62,697	75	133	25,198,500	471.41	21	123,448	2

**Source:** FEMA SQANet.

<sup>2</sup>Content and building claims.

<b>Table G-7. City of Scappoose Critical Facilities and Infrastructure</b>			
<b>Facility Type</b>	<b>Name / Number</b>	<b>Address</b>	<b>Value<sup>1</sup></b>
Government	Scappoose City Hall (includes Police Department and Municipal Court)	33568 E Columbia Ave	1,482,112
Emergency Response	Scappoose Rural Fire District	52751 Columbia River Hwy	2,510,000
Educational	Scappoose Peterson Elementary School	52050 SE 3 <sup>rd</sup> Street	15,198,000
	Scappoose Grant Watts Elementary School	52000 SE 3 <sup>rd</sup> PL	5,503,047
	Scappoose Middle School	52265 Columbia River Hwy	8,036,448
	Scappoose High School	33700 SE High School Way	26,494,279

**Table G-7. City of Scappoose Critical Facilities and Infrastructure**

Facility Type	Name / Number	Address	Value <sup>1</sup>
	Scappoose School District Office	33589 SE High School Way	614,040
	OHSU Family Medicine Clinic	Old Portland Road	Unknown
Community	Watts House Pioneer Museum	52432 SE 1st St	Unknown
	Scappoose Public Library	52469 SE 2nd St	1,543,000
	Scappoose Four Square Church	33404 SW JP West Rd	Unknown
	Church of Jesus Christ	53987 Columbia River Highway	\$170,560
	Grace Lutheran Church	51737 South Columbia River Hwy	\$648,000
	St Wenceslause Catholic Church	51555 Old Portland Rd	Unknown
	Scappoose Senior Center	33342 SW Meadow Dr	Unknown
	Creekside Baptist Church	51681 SW Old Portland Rd	\$693,290
State and Federal Highways	US Hwy 30	3 miles at \$385,000 per mile	1,155,000
Railroads	Portland Western (short line with switching facility and staging line)		3 miles
Bridges	Bridge #1	Hwy 30	\$2,600,000
	Bridge # 2 (County #7)	EJ Smith Road	\$1,400,000
	Bridge # 3 (County #1)	EM Watts Street	\$1,600,000
	Bridge # 4 (County #6)	JP West Road	\$1,600,000
	Bridge # 5 (County #10)	Scappoose Vernonia Hwy	\$1,900,000
	Bridge # 6 County #121)	Dutch Canyon Road	\$1,400,000
Transportation Facilities	Scappoose Airpark (non towered) with Heliport	Airport Road	Unknown
	First Student Bus Line Inc	Hwy 30	Unknown
Utilities	Wireless company/tower @ high school		Unknown
	Qwest Telephone		Unknown
	Water Treatment Plant		\$6,000,000
	Miller Road Water Treatment Plan		\$4,500,000
	Waste Water Treatment Plant		\$15,000,000
	Dutch Canyon Well		\$199,196
	Reservoirs (3-storage tanks) (2M, 1M, and 350K gallon)		\$4,500,000
	Reservoirs (2-storage tanks) 350K gallon capacity 300K gallon capacity		\$1,500,000
	EJ Smith Waste Lift station		\$1,200,000

**Table G-7. City of Scappoose Critical Facilities and Infrastructure**

Facility Type	Name / Number	Address	Value <sup>1</sup>
	Hwy 30, Keys Landing, Seven Oaks and Spring Lake Waste Lift station		\$1,600,000
	Columbia River PUD Power Plant/Substations		
Dams	Gourley Creek Dam		\$1,500,000
	South Fork Dam		\$1,500,000
	Lacey Creek Dam		\$750,000

**Sources:** FEMA HAZUS-MH, local jurisdictions, City of Scappoose.

<sup>1</sup>Estimated and/or insured structural value for critical facilities and estimated values for critical infrastructure.

NA = Not Available.

## VULNERABILITY ANALYSIS

The vulnerability analysis development process is thoroughly discussed in the Columbia County MHMP, Section 6, which generated the following Hazard Exposure Analysis Overviews. Tables G-8, G-9, and G-10 depict in tabular form results obtained from the GIS analysis depicted in hazard figures located in Appendix I.

<b>Table G-8. City of Scappoose Potential Hazard Exposure Analysis Overview-Population and Buildings</b>								
			<b>Population</b>	<b>Buildings</b>				
		<b>Methodology</b>		<b>Residential</b>		<b>Non-Residential</b>		
<b>Hazard Type</b>	<b>Hazard Area</b>				<b>Number</b>	<b>Value (\$)¹</b>	<b>Number</b>	<b>Value (\$)¹</b>
Flood	Moderate	500-year floodplain		--	1,328	200,129,600	7	unknown
	High	100-year floodplain		--	874	131,711,800	6	unknown
Winter Storm		descriptive		6,700	2,171	399,730,798	14	unknown
Landslide	Moderate	>14-32 degrees		--	705	106,243,500	3	unknown
	High	>32-56 degrees		--	344	51,840,800	3	unknown
Wildland Fire	Moderate	Moderate fuel rank		--	2,170	399,730,798	14	unknown
	High	High fuel rank		--	882	132,917,400	8	unknown
	Very High	Very high fuel rank		--	433	65,253,100	3	unknown
	Extreme	Extreme fuel rank		--	116	17,481,200	0	unknown
Earthquake	Strong	9-20% (g)		--	2,171	399,730,798	14	unknown
	Very strong	20-40% (g)		--	0	--	0	unknown
	Severe	>40-60% (g)		--	0	--	0	unknown
Volcano		descriptive		6,700	2,171	399,730,798	14	unknown
Wind		descriptive		6,700	2,171	399,730,798	14	unknown
Erosion		within 300' of potential areas of erosion		--	49	7,384,300	unknown	unknown
Drought		descriptive		--	--	--	--	unknown
Dam Failure	High	Inundation area		--	1,049	158,084,300	6	unknown
Disruption of Utility and Transportation Systems		descriptive		6,700	--	--	--	unknown

**Table G-8. City of Scappoose Potential Hazard Exposure Analysis Overview-Population and Buildings**

			Population	Buildings			
				Residential		Non-Residential	
Hazardous Material Event	1/4-mile buffered transportation routes	1/4-mile buffered transportation routes	--	825	124,327,800	9	unknown
	1/4-mile buffered EHS sites	1/4-mile buffered EHS sites	--	--	--	--	--
Terrorism		descriptive	--	--	--	--	--
Infectious Disease Epidemic		descriptive	6,700	--	--	--	--

<sup>1</sup> Average insured structural value of all residential buildings (including single-family dwellings, mobile homes, etc., is \$150,700 per structure).

Note-population by parcel was not available at the time this document was prepared. Once this data is available, a useful analysis of population and residential structures by hazard can easily be completed. \*0.25 mile-buffered EHS sites were unable to be determined due to the use of census block data.

**Table G-9. City of Scappoose Potential Hazard Exposure Analysis Overview-Critical Facilities**

Hazard Type	Hazard Area	Methodology	Government		Emergency Response		Educational		Care		Community	
			No.	Value (\$) <sup>1</sup>	No.	Value (\$) <sup>1</sup>	No.	Value (\$) <sup>1</sup>	No.	Value (\$) <sup>1</sup>	No.	Value (\$) <sup>1</sup>
Flood	Moderate	500-year floodplain	--	--	1	2.3M	2	13.3M	none	none	4	unknown
	High	100-year floodplain	--	--	1	2.3M	1	3.6M	none	none	3	78K
Winter Storm		descriptive	1	1.1M	1	2.5M	10	59.7M	none	none	16	2.5M
Landslide	Moderate	>14-32 degrees	--	--	--	--	3	7.7M	none	none	3	213K
	High	>32-56 degrees	--	--	--	--	--	--	none	none	1	77K
Wildland Fire	Moderate	Moderate fuel rank	1	1.1M	1	2.3M	9	19.5M	none	none	16	2.5M
	High	High fuel rank	--	--	--	--	6	17.9M	none	none	4	272K
	Very High	Very high fuel rank	--	--	--	--	--	--	none	none	1	78K
	Extreme	Extreme fuel rank	--	--	--	--	--	--	none	none	--	--
Earthquake	Strong	9-20% (g)	1	1.1M	1	2.3M	10	59.7M	none	none	16	2.5M
	Very strong	20-40% (g)	--	--	--	--	--	--	none	none	--	--
	Severe	>40-60% (g)	--	--	--	--	--	--	none	none	--	--
Volcano		descriptive	1	1.1M	1	2.3M	10	59.7M	none	none	16	2.5M
Wind		descriptive	1	1.1M	1	2.3M	10	59.7M	none	none	16	2.5M
Erosion		within 300' of potential areas of erosion	--	--	--	--	1	3.6M	none	none	--	--
Drought		descriptive	1	1.1M	1	2.3M	10	21M	none	none	16	2.5M
Dam Failure	High	Inundation area	1	1M	1	2.3M	5	12.7M			7	1.7M
Disruption of Utility and Transportation Systems		descriptive	1	1.1M	1	2.3M	10	21M	none	none	16	2.5M
Hazardous Material Event	1/4-mile buffered transportation routes	1/4-mile buffered transportation routes	1	1.1M	1	2.3M	8	15.8M	none	none	15	2.4M
	1/4-mile buffered EHS sites	1/4-mile buffered EHS sites	1	1.1M	1	2.3M	8	15.8M	none	none	14	2.4M
Terrorism		descriptive	1	1.1M	1	2.3M	10	21M	none	none	16	2.5M
Infectious Disease Epidemic		descriptive	1	1.1M	1	2.3M	10	21M	none	none	16	2.5M

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**Table G-10. City of Scappoose Potential Hazard Exposure Analysis Overview-Critical Infrastructure**

Hazard Type	Hazard Area	Methodology	Highways		Railroads		Bridges		Transportation Facilities		Utilities		Dams	
			Miles	Value (\$)¹	Miles	Value (\$)¹	No.	Value (\$)¹	No.	Value (\$)¹	No.	Value (\$)¹	No.	Value (\$)¹
Flood	Moderate	500-year floodplain	--	--	--	--	5	5.1M	--	--	3	19.5M	--	--
	High	100-year floodplain	--	--	--	--	6	10.7M	--	--	2	15.2M	--	--
Winter Storm			1 unknown	unknown	1 unknown	unknown	6	10.7M	2	unknown	5	24.2M	--	--
Landslide	Moderate	>14-32 degrees	--	--	--	--	1	1.4M	--	--	2	4.7M	--	--
	High	>32-56 degrees	--	--	--	--	--	--	--	--	--	--	--	--
Wildland Fire	Moderate	Moderate fuel rank	1 unknown	unknown	1 unknown	unknown	6	10.7M	2	unknown	5	24.2M	--	--
	High	High fuel rank	--	--	--	--	--	--	1	unknown	3	4.7M	--	--
	Very High	Very high fuel rank	--	--	--	--	--	--	--	--	--	--	--	--
	Extreme	Extreme fuel rank	--	--	--	--	--	--	--	--	--	--	--	--
Earthquake	Strong	9-20% (g)	1 unknown	unknown	1 unknown	unknown	6	10.7M	2	unknown	5	24.2M	--	--
	Very strong	20-40% (g)	--	--	--	--	--	--	--	--	--	--	--	--
	Severe	>40-60% (g)	--	--	--	--	--	--	--	--	--	--	--	--
Volcano			1 unknown	unknown	1 unknown	unknown	6	10.7M	2	unknown	5	24.2M	--	--
Wind			1 unknown	unknown	1 unknown	unknown	6	10.7M	2	unknown	5	24.2M	--	--
Erosion		within 300' of potential areas of erosion	--	--	--	--	6	10.7M	--	--	1	unknown	--	--
Drought		descriptive	3	1.2M	3	unknown	6	10.7M	2	unknown	9	32M	3	3.8M
Dam Failure	High	Inundation area	--	--	--	--	2	3.6M	2	unknown	4	19.7M		
Disruption of Utility and Transportation Systems		descriptive	3	1.2M	3	unknown	6	10.7M	2	unknown	9	32M	3	3.8M
Hazardous Material Event	1/4-mile buffered transportation routes	1/4-mile buffered transportation routes	1 unknown	unknown	1 unknown	unknown	4	4.7M	1	unknown	2	200K	--	--
	1/4-mile buffered EHS sites	1/4-mile buffered EHS sites	--	--	--	--	4	4.7M	2	unknown	5	24.2M	--	--
Terrorism		descriptive	3	1.2M	3	unknown	6	10.7M	2	unknown	9	32M	3	3.8M
Infectious Disease Epidemic		descriptive	3	1.2M	3	unknown	6	10.7M	2	unknown	9	32M	3	3.8M



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## **SUMMARY OF VULNERABILITIES AND IMPACTS TO IDENTIFIED HAZARDS**

The following section describes community specific vulnerabilities and impacts from natural hazards in addition to technological and manmade hazards identified in the 2009 Columbia County MHMP and 2010 FEMA flood map.

The following is derived from the best available data for facility locations and values. In many cases, values were unavailable, and therefore the totals listed below should be considered incomplete and likely less than the actual costs associated with the respective hazards.

### ***Flood***

FEMA FIRMs were used to outline the 100-year and 500-year floodplains for the City of Scappoose. The 100-year floodplain delineates an area of high risk, while the 500-year floodplain delineates an area of moderate risk.

There are 874 residential structures (worth \$131.7M), six non-residential structures (value unknown), one emergency response facility (worth \$2.3M), three community facilities (worth \$78K), six bridges (worth \$10.5M) and two utilities (worth \$15.2M) within the boundaries of the 100-year floodplain.

There are 1,328 residential structures (worth \$250M), seven non-residential structures (value unknown), one emergency response facility (worth \$2.3M) four community facilities (value unknown), five bridges (worth \$8.5M) and three utilities (worth \$19.5M) within the 500-year floodplain.

### ***Winter Storm***

The natural hazards resulting from winter storms, such as ice, cold, wind and floods, are often widespread. A single event is capable of impacting all people, critical facilities and infrastructure within the City of Scappoose, and therefore the entire population (6,700 people), including 2,171 residential structures (worth \$327.2M), 14 non-residential structures (value unknown), one government facility (worth \$1.1M), one emergency response facility (worth \$2.3M), seven educational facilities (worth \$59.7M), 16 community facilities (value \$2.5M), six bridges (worth \$10.7M), one highway (value unknown), one railroad (value unknown), two transportation facilities (value unknown), and five utilities (worth \$24.2M) are located in the winter storm area.

### ***Landslide***

The potential impacts from landslides can be widespread. Potential debris flows and landslides can impact transportation and rail routes, utility systems, and water and waste treatment infrastructure along with public, private, and business structures located adjacent to steep slopes, along riverine embankments, or within alluvial fans or natural drainages. Response and recovery efforts will likely vary from minor cleanup to more extensive utility system rebuilding. Utility disruptions are usually local and terrain dependent. Damages may require reestablishing electrical, communication, and gas pipeline connections occurring from specific breakage points. Initial debris clearing from emergency routes and high traffic areas may be required. Water and

waste water utilities may need treatment to quickly improve water quality by reducing excessive water turbidity and reestablishing waste disposal capability.

USGS elevation datasets were used to determine the landslide hazard areas within the City of Scappoose. Risk was assigned based on slope angle. A slope angle less than 14 degrees was assigned a low risk, a slope angle between 14 and 32 degrees was assigned a medium risk, and a slope angle greater than 32 degrees was assigned a high risk.

There are 705 residential structures (worth \$106.2M), three non-residential structures (value unknown), two educational facilities (worth \$8.1M), three community facilities (worth \$213K), one bridge (worth \$1.4M) and two utilities (worth \$4.7M) in the medium landslide risk area. There are 344 residential structures (worth \$51.8M), three non-residential structures (value unknown), and one community facility (worth \$77K) in the high landslide risk area.

### *Wildland Fires*

Wildland fire hazard areas were identified using a model incorporating slope, aspect, and fuel load. South-facing, steep, and heavily vegetated areas were assigned the highest fuel values while areas with little slope and natural vegetation were assigned the lowest fuel values. Risk levels of moderate, high, very high, and extreme were assigned to the entire region based on the results of this modeling.

There are 2,209 residential structures (worth \$327M), 14 non-residential structures (value unknown), one government facility (worth \$1.1M), one emergency response facility (worth \$2.3M), seven educational facilities (worth \$59.7M), 16 community facilities (value \$2.5M), six bridges (worth \$5.7M), one highway (value unknown), one railroad (value unknown), two transportation facilities (value unknown), and five utilities (worth \$24.2M) located in moderate fire risk areas.

There are 882 residential structures (worth \$132.9M), eight non-residential structures (value unknown), seven educational facilities (worth \$59.7M), four community facilities (value \$272K), one transportation facility (value unknown), two bridges (worth \$2.8M), and three utilities (value \$4.7M) located in the high fire risk areas.

There are 433 residential structures (worth \$65.3M), three non-residential structures (value unknown), one community facility (worth \$78K), and two utilities (worth \$4.7M) located in very high fire risk areas. There were 116 residential structures (worth \$17.5M) and no critical facilities identified in the extreme fire risk area.

### *Earthquake*

Based on PGA shake maps produced by the USGS, the western portion of Columbia County is likely to experience higher levels of shaking than the eastern portion, as a result of its proximity to the Cascadia Subduction Zone. Ground movement in both areas, however, is likely to cause damage to weak, unreinforced masonry buildings, and to induce small landslides along unstable slopes. As well as landslide, earthquakes can trigger other hazards such as dam failure and disruption of transportation and utility systems.

The eastern portion of Columbia County is likely to experience strong shaking should a subduction zone earthquake occur (9-20 percent of the acceleration of gravity). In contrast, the

far western portion of the county is likely to experience very strong shaking (20-25 percent). This rating represents the peak acceleration of the ground caused by the earthquake.

Due to City of Scappoose's proximity to the eastern portion of the county, all people, critical facilities and infrastructure within the City of Scappoose, and therefore the entire population (6,700 people), including 2,209 residential structures (worth \$450M), 14 non-residential structures (value unknown), one government facility (worth \$1.1M), one emergency response facility (worth \$2.3M), seven educational facilities (worth \$59.7M), 16 community facilities (value \$2.5M), six bridges (worth \$10.5M), one highway (value unknown), one railroad (value unknown), two transportation facilities (value unknown), and five utilities (worth \$24.2M) are located in the strong shaking (9-20 percent) area.

### *Volcano*

A volcanic eruption would have a minor impact on The City of Scappoose due to the proximity to volcanoes within the Cascade region. The major resources of concern include air quality and waterway sedimentation. During previous eruptions, ashfall has drifted to the east of the volcanoes. (State Interagency Hazard Mitigation Team 2006)

The City of Scappoose will likely only experience damage from volcanic eruption columns and clouds which contain volcanic gases, minerals, and rock. The columns and clouds form rapidly and extend several miles above an eruption. Solid particles within the clouds present a serious aviation threat, can distribute acid rain (sulfur dioxide gas and water), can create risk of suffocation (carbon dioxide is heavier than air and collects in valleys and depressions threatening human and animals), and pose a toxic threat from fluorine which clings to ash particles potentially poisoning grazing livestock and contaminating domestic water supplies.

Buildings streets and roads throughout the city may require minor cleanup with negligible impacts. Temporary utility interruptions are likely, and minor cleanup may be required for electrical and other utility services. Water treatment facilities may require additional attention to address high turbidity water. River traffic along the Columbia River could be disrupted due to sedimentation from a large eruption from Mt. St. Helens or Hood and dredging to restore channel depths may be necessary. Injuries associated with respiratory problems may result. (Goettel 2005)

Due to the nature of the hazard, it is impossible to predict the location or extent of future events with any probability, although it can be assumed that all critical facilities and infrastructure within the City of Scappoose are at risk including the entire population (6,700 people), including 2,209 residential structures (worth \$450M), 14 non-residential structures (value unknown), one government facility (worth \$1.1M), one emergency response facility (worth \$2.3M), seven educational facilities (worth \$59.7M), 16 community facilities (value \$2.5M), six bridges (worth \$10.5M), one highway (value unknown), one railroad (value unknown), two transportation facilities (value unknown), and five utilities (worth \$24.2M).

### *Wind*

Many buildings, utilities and transportation systems in open areas, natural grasslands, or agricultural lands are especially vulnerable to wind damage. Impacts associated with wind can

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include damage to power lines, trees, and structures, and can also cause temporary disruptions of power. Additionally, high winds can cause significant damage to forestlands.

All areas within the City of Scappoose are equally at risk of a windstorm event including all people, critical facilities and infrastructure, and therefore the entire population (6,090 people), including 2,209 residential structures (worth \$450M), 14 non-residential structures (value unknown), one government facility (worth \$1.1M), one emergency response facility (worth \$2.3M), seven educational facilities (worth \$59.7M), 16 community facilities (value \$2.5M), six bridges (worth \$10.7M), one highway (value unknown), one railroad (value unknown), two transportation facilities (value unknown), and five utilities (worth \$24.2M).

### *Erosion*

Riverine and stream erosion rarely causes death or injury. However, erosion causes significant destruction of property, development, and infrastructure. Erosion hazard data is not readily available; however, descriptions of several localized areas were identified during the development of this document and are identified only by location on a map referencing the river or stream reach described. Critical facilities that may be at risk of erosion were identified using a 300 foot-buffer in the areas identified as having historic erosion impacts to conservatively account for building footprints.

The City of Scappoose has 49 residential structures (worth \$7.4M), one educational facility (worth \$3.6M), and six bridges (worth \$10.7M) within potential erosion hazard areas. There is also one pump station (worth \$1.2M ) and sewer and water lines (values unknown) in close proximity (within 30 feet) of Scappoose Creek which poses an erosion threat to the infrastructure.

### *Drought*

State-wide droughts have historically occurred in Oregon, and as it is a region-wide phenomenon, all residents are equally at risk. Structural damage from drought is not expected; rather the risks are present to humans and resources. Agriculture, fishing, and timber have historically been impacted, as well as local and regional economies.

### *Dam Failure*

US Army Corps of Engineers inundation data for the Columbia River and the PacifiCorp inundation data for the Lewis River in the State of Washington were used to determine the impacts from dam failure upriver from the City of Scappoose. There are 1,049 residential structures (worth \$200M), six non-residential structures (value unknown), one government facility (value \$1M), one emergency response facility (value \$2.3M), seven educational facilities (worth \$59.7M), seven community facilities (value \$1.7M), two bridges (worth \$3.6M), two transportation facilities (value unknown), and four utilities (value \$19.7M) located in the inundation area.

### *Disruption of Utility and Transportation Systems*

Transportation system disruption impacts range from effects on life, health, and safety (emergency vehicle mobility, access to hospitals, access to evacuation routes, access to vital

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supplies if transport is seriously disrupted for a long time) to the economic effects of delays, lost commerce, and lost time. Similarly, disruption of utility systems can affect the county at the level of commerce and recreation as well as at the level of fundamental health and safety. County-wide as well as localized areas of disruption are likely to impact all residents equally. Structural damage from disruption to these systems is not expected; rather the risks are present to residents and those traveling in the area.

### *Hazardous Material Event*

The National Response Center and the EPA's Environmental Facts Multisystem Query were used to locate hazardous waste handling facilities and businesses that generate hazardous waste from their activities. **(In Progress)** Transportation routes likely to carry hazardous waste were examined, and all facilities within a 0.25 mile radius of those are considered at risk.

There are 825 residential structures (worth \$150M), nine non-residential structures (value unknown), one government facility (worth \$1.1M), one emergency response facility (worth \$2.3M), seven educational facilities (worth \$59.7M), 15 community facilities (worth \$2.4M), one highway (value unknown), one railroad (value unknown), 4 bridges (worth \$7.2M), one transportation facility (value unknown), and two utilities (worth \$200K) located within 0.25 mile of a transportation route and may be at risk from a hazardous material event.

Facilities considered at risk near 0.25 mile-buffered EHS Sites include one government facility (worth \$1.1M), one emergency response facility (worth \$2.3M), seven educational facilities (worth \$59.7M), 14 community facilities (worth \$2.4M), 4 bridges (worth \$7.2M), two transportation facilities (value unknown), and five utilities (worth \$24.2M).

### *Terrorism*

It is difficult to determine the scope of any terrorist threat to the City of Scappoose. Although there seem to be few high-profile targets present, it is impossible to predict future terrorist events. Depending on the extent of the action, the community may suffer economic loss, disruption of utilities, and cleanup relating to explosions and other facility damages. Structural damage, injuries or casualties may occur, however, it is beyond the scope of this analysis to estimate losses.

### *Infectious Disease Epidemic*

The consequences of a pandemic as described in Chapter 5 could be devastating. In the event of a poor-fit vaccine or very limited vaccine supply, the public health measures that would work best include: isolation and quarantine; restricting movement between and within communities; prohibiting public gatherings and group activities; and closing schools.

The county and state have isolation and quarantine laws; cities can also apply quarantines and restrict public movement in a public health emergency. The recently passed public health emergency law in Oregon provides a process for such mechanisms to be implemented.

Impacts associated with infectious disease epidemics in general have the potential to include loss of life and shutdown of critical facilities. Furthermore, an epidemic level of infectious disease in the community could overwhelm local resources, although there are no structural risks or losses

associated with this hazard. The entire population of 6,700 is at risk from the effects of an infectious disease epidemic.

## MITIGATION STRATEGY

### IDENTIFYING MITIGATION ACTIONS

The following section defines identification and analysis of mitigation actions as stipulated in DMA 2000 and its implementing regulations.

**DMA 2000 Requirements: Mitigation Strategy - Identification and Analysis of Mitigation Actions**

**Identification and Analysis of Mitigation Actions**

**Requirement §201.6(c)(3)(ii):** [The mitigation strategy shall include a] section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard, with particular emphasis on new and existing buildings and infrastructure.

**Element**

- Does the new or updated plan identify and analyze a comprehensive range of specific mitigation actions and projects for each hazard?
- Do the identified actions and projects address reducing the effects of hazards on new buildings and infrastructure?
- Do the identified actions and projects address reducing the effects of hazards on existing buildings and infrastructure?

Source: FEMA, July 2008.

The Steering Committee assessed whether to adopt Columbia County’s hazard mitigation goals listed in Table G-11, or to revise them to better meet the City’s needs. The City then proceeded to evaluate potential mitigation actions after finalizing the mitigation goals.

Mitigation actions are activities, measures, or projects that help achieve the goals of a mitigation plan. Table G-12 depicts the City’s “considered” mitigation actions developed during this mitigation planning process. The revised list in Table G-14 delineates those actions the City will strive to implement within this five year planning cycle.

**DMA 2000 Requirements: Mitigation Strategy - National Flood Insurance Program (NFIP) Compliance**

**National Flood Insurance Program (NFIP) Compliance**

**Requirement §201.6(c)(3)(ii):** [The mitigation strategy] must also address the jurisdiction’s participation in the National Flood Insurance Program (NFIP), and continued compliance with NFIP requirements, as appropriate.

**Element**

- Does the new or updated plan describe the jurisdiction(s) participation in the NFIP?
- Does the mitigation strategy identify, analyze and prioritize actions related to continued compliance with the NFIP?

Source: FEMA, July 2008.

The City of Scappoose actively participates in FEMA’s National Flood Insurance Program (NFIP) and has implemented floodplain policies, regulations, and ordinances to protect its threatened population and infrastructure to assure NFIP compliance.

The City’s Mitigation Strategy identified and analyzed potential flood mitigation actions that would fulfill NFIP initiatives, specifically addressing repetitive loss (RL) properties. The City subsequently selected and prioritized City appropriate actions to assure an effective flood mitigation program.

## MITIGATION GOALS AND ACTION ITEMS CONSIDERED

<b>Table G-11. 2014 Columbia County Mitigation Goals-Considered</b>	
<b>Goal Number</b>	<b>Goal Description</b>
1	<p><b>Reduce the Threat to Life Safety</b> Enhance life safety by minimizing the potential for deaths and injuries in future disaster events.</p>
2	<p><b>Protect Critical Facilities and Enhance Emergency and Essential Services</b></p> <ul style="list-style-type: none"> <li>• Implement activities or projects to protect critical facilities and infrastructure.</li> <li>• Seek opportunities to enhance, protect, and integrate emergency and essential services.</li> <li>• Strengthen emergency operations plans and procedures by increasing collaboration and coordination among public agencies, non-profit organizations, business, and industry.</li> </ul>
3	<p><b>Reduce the Threat to Property</b></p> <ul style="list-style-type: none"> <li>• Seek opportunities to protect, enhance and integrate emergency and essential services.</li> <li>• Strengthen emergency operations plans and procedures by increasing collaboration and coordination among public agencies, non-profit organizations, business, industry and the citizens of Columbia County.</li> </ul>
4	<p><b>Create a Disaster Resistant and Disaster-Resilient Economy</b></p> <ul style="list-style-type: none"> <li>• Develop and implement activities to protect economic well-being and vitality while reducing economic hardship in post disaster situations.</li> <li>• Reduce insurance losses and repetitive claims for chronic hazard events.</li> <li>• Work with State and Federal Partners to reduce short-term and long-term recovery and reconstruction costs.</li> <li>• Work with local organization, such as Columbia Emergency Planning Association (CEPA).</li> <li>• Expedite pre-disaster and post-disaster grants and program funding.</li> </ul>
5	<p><b>Increase Public Awareness, Education, Outreach, and Partnerships</b></p> <ul style="list-style-type: none"> <li>• Coordinate and collaborate, where possible, risk reduction outreach efforts with the Oregon Partners for Disaster Resistance &amp; Resilience and other public and private organizations.</li> <li>• Develop and implement risk reduction education programs to increase awareness among citizens, local, county, and regional agencies, non-profit organizations, business, and industry.</li> <li>• Promote insurance coverage for catastrophic hazards</li> <li>• Strengthen communication and coordinate participation in and between public agencies, citizens, nonprofit organizations, business, and industry.</li> </ul>



**Table G-12. City of Scappoose Mitigation Actions Considered**

Hazard	Status	Comment	Description
<i>Natural Hazards</i>			
<i>Multi-Hazard</i>			
MH	<i>Ongoing</i>		Develop and incorporate building ordinances commensurate with building codes to reflect survivability from wind, seismic, fire, and other hazards to ensure occupant safety.
MH	<i>Ongoing</i>		Review ordinances and develop outreach programs to assure mobile homes and manufactured buildings are protected from severe wind and flood hazards. (Anchoring, elevation, and other methods as applicable)
MH	<i>Ongoing</i>		Cross reference and incorporate mitigation planning provisions into all community planning processes such as comprehensive, capital improvement, land use, transportation plans, etc to demonstrate multi-benefit considerations and facilitate using multiple funding source consideration.
MH	<i>Ongoing</i>		Develop and incorporate mitigation provisions and recommendations into zoning ordinances and community development processes to maintain the floodway and protect critical infrastructure and private residences from other hazard areas.
MH	<i>Ongoing</i>		Increase power line wire size and incorporate quick disconnects (break away devices) to reduce ice load and wind storm power line failure during severe wind or winter ice storm events.
MH	<i>Ongoing</i>		Purchase and install generators with main power distribution disconnect switches for identified and prioritized critical facilities susceptible to short term power disruption. (i.e. first responder and medical facilities, schools, correctional facilities, and water and sewage pump stations, etc.)
MH	Consider		Install lightening grade surge protection devices on critical electronic components such as warning systems, communications equipment, and computers for critical facilities.
MH	<i>Ongoing</i>		Develop, produce, and distribute information materials concerning mitigation, preparedness, and safety procedures for all natural hazards.
MH	<i>Ongoing</i>		Explore the need for, develop, and implement hazard zoning ordinances for high-risk hazard area land-use.
MH	<i>Ongoing</i>		Based on known high-risk hazard areas, identify hazard-specific signage needs and purchase and install hazard warning signs near these areas to notify and educate the public of potential hazards.
MH	<i>Ongoing</i>		Identify and list repetitively flooded structures and infrastructures, analyze the threat to these facilities, and prioritize mitigation actions to acquire, relocate, elevate, and/or flood proof to protect the threatened population.
MH	<i>Ongoing</i>		Perform hydrologic and hydraulic engineering, and drainage studies and analyses. Use information obtained for feasibility determination and project design. This information should be a key component, directly related to a proposed project.
MH	<i>Ongoing</i>		Develop vegetation projects to restore clear cut and riverine erosion damage and to increase landslide susceptible slope stability.
MH	<i>Ongoing</i>		Retrofit structures to protect them from seismic, floods, high winds, earthquakes, or other natural hazards.
MH	<i>Ongoing</i>	<sup>1</sup> City Admin/PW	Acquire, demolish, or relocate structures from hazard prone area. Property deeds shall be restricted for open space uses in perpetuity to keep people from rebuilding in hazard areas.
MH	<i>Ongoing</i>		Harden utility headers located along river embankments to mitigate potential flood, debris, and erosion damages.

**Table G-12. City of Scappoose Mitigation Actions Considered**

<b>Hazard</b>	<b>Status</b>	<b>Comment</b>	<b>Description</b>
MH	<i>Ongoing</i>		Establish a formal role for the jurisdictional Hazard Mitigation Planning Committees to develop a sustainable process to implement, monitor, and evaluate citywide mitigation actions.
MH	<i>Ongoing</i>	<sup>2</sup> City Admin	Identify and pursue funding opportunities to implement mitigation actions.
MH	<i>Ongoing</i>		Develop public and private sector partnerships to foster hazard mitigation activities.
MH	<i>Ongoing</i>		Integrate the Mitigation Plan findings into planning and regulatory documents and programs and into enhanced emergency planning.
MH	<i>Ongoing</i>		Review City insurance to ensure infrastructure is properly covered.
<b>Flood</b>			
Flood	<i>Ongoing</i>		Develop and maintain GIS mapped critical facility inventory for all structures located within 100-year and 500-year floodplains.
Flood	<i>Ongoing</i>		Develop and maintain GIS mapped inventory, and develop prioritized list of residential and commercial buildings within 100-year and 500-year floodplains.
Flood	<i>Ongoing</i>	<sup>1</sup> City Admin/PW	Develop and maintain GIS mapped inventory of repetitive loss properties to include the types and numbers of properties.
Flood	<i>Ongoing</i>	<sup>2</sup> City Admin/PW	Develop and implement mitigation actions for repetitive loss properties.
Flood	<i>Ongoing</i>		Establish flood mitigation priorities for critical facilities and residential and commercial buildings located within the 100- year floodplain using survey elevation data.
Flood	<i>Ongoing</i>		Implement mitigation measures identified by critical facilities' owners, and other facility owners, to protect facilities located within the 100-year floodplain.
Flood	<i>Ongoing</i>		Develop and maintain an inventory of locations subject to frequent storm water flooding based on most current USACOE flood data.
Flood	Consider		Request DOGAMI debris flow and lahar data be included in FIRM updates. Use the updated FIRMS for land use and mitigation planning.
Flood	Consider		Determine and implement most cost beneficial and feasible mitigation actions for locations with repetitive flooding and significant damages or road closures.
Flood	<i>Ongoing</i>		Develop an outreach program to educate public concerning NFIP participation benefits, floodplain development, land use regulation, and NFIP flood insurance availability to facilitate continued compliance with the NFIP.
Flood	<i>Ongoing</i>		Develop, implement, and enforce floodplain management ordinances.
Flood	<i>Ongoing</i>		Develop outreach program to educate residents concerning flood proofed well and sewer/septic installation.
Flood	<i>Ongoing</i>		Acquire, relocate, elevate, or otherwise flood-proof identified properties.
Flood	<i>Ongoing</i>		Acquire, relocate, elevate, or otherwise flood-proof critical facilities.
Flood	<i>Ongoing</i>		Install new streamflow and rainfall measuring gauges.
Flood	<i>Ongoing</i>		Develop, or revise, adopt, and enforce storm water ordinances and regulations to manage run-off from new

**Table G-12. City of Scappoose Mitigation Actions Considered**

Hazard	Status	Comment	Description
			development, including buffers and retention basins.
Flood	Consider		Construct earthen berms to divert flood flows into bridge or culvert openings. The earth fill should be erosion-resistant and the berms should be covered with erosion-resistant fabric, armoring materials, or vegetation.
Flood	<i>Ongoing</i>		Increase culvert size to increase its drainage efficiency.
Flood	<i>Ongoing</i>		Construct debris basins to retain debris in order to prevent downstream drainage structure clogging.
Flood	Consider		Install debris cribs over culvert inlets to prevent inflow of coarse bed-load and light floating debris.
Flood	Consider		Construct debris deflectors to deflect the major portion of debris away from culvert entrances and bridge piers. They are normally "V" shaped.
Flood	Consider		Install debris fins upstream of a culvert to align debris so that the debris will pass through a drainage opening without clogging the inlet. They are sometimes used on bridge piers to deflect drifting materials.
Flood	Consider		Create detention storage basins, ponds, reservoirs etc. to allow water to temporarily accumulate to reduce pressure on culverts and low water crossings. Water ultimately returning to its watercourse at a reduced flow rate.
Flood	Consider		Install triangular or circular flow deflectors on or immediately upstream from bridge footings to deflect water flow and reduce flow velocities preventing footing scour.
Flood	Consider		Construct low water crossings in a road prism to carry flood flows from an intermittent drainage
Flood	Consider		Construct a high water overflow crossing to carry flood flows from over bank areas.
Flood	Consider		Realign bridge piers & abutments to be parallel with the stream's centerline. This prevents pier and abutment undermining and reduces debris catchment.
Flood	Consider		Create relief drainage ditch opening using a culvert, bridge, or multiple culverts; to relieve rapid water accumulation during high water flow events. .
Flood	Consider		Raise bridge height or convert bridge from a multi-span to single span to increase water flow and reduce debris catchment.
Flood	Consider		Modify existing culverts by developing a ring compression, by flattening, or beveling the end of a circular culvert to match the angle of the embankment. May need to install flanges to stiffen the beveled section of the culvert.
Flood	Consider		Construct spur dikes along the embankments to direct flood flows into a bridge opening or away from a continuous impact site.
Flood	Consider		Construct concrete wing walls at culvert or bridge entrances and outlets to direct water flow into their openings
Flood	Consider		Provide flood protection to mitigate damage and contamination of wastewater treatment systems.
Flood	Consider		Develop and implement flood risk reduction program and outreach efforts considering upstream storage, channel improvements, and flood walls or levee construction.
Flood	<i>Ongoing</i>		Develop and maintain GIS mapped critical facility inventory for all structures located within 100-year and 500-year floodplains.
Flood	<i>Ongoing</i>		Develop and maintain GIS mapped inventory, and develop prioritized list of residential and commercial buildings within 100-year and 500-year floodplains.

**Table G-12. City of Scappoose Mitigation Actions Considered**

<b>Hazard</b>	<b>Status</b>	<b>Comment</b>	<b>Description</b>
Flood	<i>Ongoing</i>		Develop and maintain GIS mapped inventory of repetitive loss properties to include the types and numbers of properties.
Flood	<i>Ongoing</i>		Develop and implement mitigation actions for repetitive loss properties.
<b>Winter Storm</b>			
Winter Storm	<i>Ongoing</i>		Develop and implement strategies and educational outreach programs for debris management from severe winter storms.
Winter Storm	<i>Ongoing</i>		Develop and implement programs to coordinate maintenance and mitigation activities to reduce risk to public infrastructure from severe winter storms.
Winter Storm	<i>Ongoing</i>		Update or develop, implement, and maintain jurisdictional debris management plans.
Winter Storm	<i>Ongoing</i>	<sup>1</sup> City Admin/PW/ PD/Fire District	Develop critical facility list needing emergency back-up power systems, prioritize, seek funding and implement mitigation actions.
Winter Storm	<i>Ongoing</i>	<sup>2</sup> City Admin/PW/ PD/Fire District	Develop and maintain severe winter storm public outreach program defining mitigation activity benefits through educational outreach aimed at households and businesses while targeting of special needs populations.
Winter Storm	<i>Ongoing</i>		Develop and implement tree clearing mitigation programs to keep trees from threatening lives, property, and public infrastructure from severe weather events.
Winter Storm	<i>Ongoing</i>		Develop, implement, and maintain partnership program with electrical utilities to use underground utility placement methods where possible to reduce or eliminate power outages from severe winter storms. Consider developing incentive programs.
Winter Storm	Consider		Develop personal use and educational outreach training for a “tree safety” program. Implement along utility and road corridors, preventing potential winter storm damage.
Winter Storms	<i>Ongoing</i>		Purchase NOAA Weather radios and develop a web portal linking residents to various weather information sites. (NWS, FEMA, The Weather Channel).
Winter Storms	Consider		Install new streamflow and precipitation measuring gauges and develop monitoring and early warning program.
Winter Storms	Consider		Develop outreach program with school district contests having students develop, display, and explain mitigation projects or initiatives.
Winter Storms	Consider		Develop early warning test program partnering with NOAA, City Police, and Fire District to coordinate tests.
Winter Storms	<i>Ongoing</i>		Implement and enforce the most current Uniform International, and State, Building Codes to ensure structures can withstand winter storm hazards such as high winds, rain, water and snow.
Winter Storms	<i>Ongoing</i>		Increase power line wire size and incorporate quick disconnects (break away devices) to reduce ice load power line severe wind or winter ice storm event failure.
Winter	<i>Ongoing</i>		Review critical facilities and government building energy efficiency, winter readiness, and electrical protection

**Table G-12. City of Scappoose Mitigation Actions Considered**

<b>Hazard</b>	<b>Status</b>	<b>Comment</b>	<b>Description</b>
Storms			capability. Identify, prioritize, and implement infrastructure upgrade or rehabilitation project prioritization and development.
<b>Landslide</b>			
Landslide	<i>Ongoing</i>	<sup>1</sup> City Admin/PW	Complete a landslide location inventory, identify threatened critical facilities and other buildings and infrastructure using GIS.
Landslide	<i>Ongoing</i>		Develop prioritized list of mitigation actions for threatened critical facilities and other buildings or infrastructure.
Landslide	<i>Ongoing</i>		Develop process to limit future development in high landslide potential areas (permitting, geotechnical review, soil stabilization techniques, etc).
Landslide	<i>Ongoing</i>		Update the storm water management plan to include regulations to control runoff, both for flood reduction and to minimize saturated soils on steep slopes that can cause landslides.
Landslide	Consider		Develop comprehensive geological landslide and rockslide prone area maps.
Landslide	<i>Ongoing</i>		Develop a vegetation management plan addressing slope-stabilizing root strength while facilitating precipitation containment.
Landslide	Consider		Identify and seasonally restrict recreational and construction activities in high landslide areas.
Landslide	<i>Ongoing</i>		Develop, implement and enforce property development landslide risk assessment procedures to identify potential facility vulnerability.
<b>Wildland Fire</b>			
Wildland Fire	<i>Ongoing</i>		Identify critical facilities and vulnerable populations based on mapped high hazard areas.
Wildland Fire	<i>Ongoing</i>		Identify evacuation routes away from high hazard areas and develop outreach program to educate the public concerning warnings and evacuation procedures.
Wildland Fire	<i>Ongoing</i>		Develop Community Wildland Fire Protection Plans for all at-risk communities.
Wildland Fire	<i>Ongoing</i>		Provide real-time internet access and interagency cooperation to decrease wildland fire warning times.
Wildland Fire	<i>Ongoing</i>		Hold FireWise workshop to educate residents and contractors concerning fire resistant landscaping.
Wildland Fire	<i>Ongoing</i>		Promote FireWise building siting, design, and construction materials.
Wildland Fire	<i>Ongoing</i>		Retrofit structures with FireWise building design materials.
Wildland Fire	<i>Ongoing</i>		Develop FireWise Public Service Announcements (PSA).
Wildland Fire	<i>Ongoing</i>		Provide wildland fire information in an easily distributed format for all residents.
Wildland Fire	<i>Ongoing</i>		Schedule and perform government facility "fire drills" at least twice per year.
Wildland Fire	<i>Ongoing</i>		Conduct residential audits for wildland and building fire hazard identification then develop an outreach program to convey the findings.
Wildland Fire	<i>Ongoing</i>	<sup>2</sup> City Admin Fire District	Develop, adopt, and enforce burn ordinances that require burn permits, restricts campfires, and controls outdoor burning.
Wildland Fire	<i>Ongoing</i>	1	Develop outreach program to educate and encourage fire-safe construction practices for existing and new

**Table G-12. City of Scappoose Mitigation Actions Considered**

<b>Hazard</b>	<b>Status</b>	<b>Comment</b>	<b>Description</b>
		City Admin Fire District	construction in high risk areas.
Wildland Fire	<i>Ongoing</i>		Develop outreach program to educate and encourage home landscape cleanup (defensible space) and define debris disposal programs.
Wildland Fire	<i>Ongoing</i>		Identify, develop, and implement, and enforce mitigation actions such as fuel breaks and reduction zones for potential wildland fire hazard areas.
<b>Earthquake</b>			
Earthquake	<i>Ongoing</i>		Supplement State Seismic Needs Analysis data (schools, fire, law enforcement). Complete inventory of public and commercial buildings that may be particularly vulnerable to earthquake damage.
Earthquake	<i>Ongoing</i>	<b>1</b> City Admin/PW/ PD/FD/School D/Utilities	Identify high seismic hazard areas using GIS; develop a wood-frame residential building inventory and an outreach program to educate population concerning facilities particularly vulnerable to earthquake damage, such as pre-1940s homes and homes with cripple wall foundations.
Earthquake	<i>Ongoing</i>		Disseminate FEMA pamphlets to educate and encourage homeowners concerning seismic structural and non-structural retrofit benefits.
Earthquake	<i>Ongoing</i>		Retrofit important public facilities with significant seismic vulnerabilities, such as unreinforced masonry construction.
Earthquake	<i>Ongoing</i>		Retrofit bridges that are not seismically adequate for lifeline transportation routes.
Earthquake	<i>Ongoing</i>	<b>2</b> City Admin/PW/ PD/FD/School D/Utilities	Update existing (or adopt the most current) Uniform Building Code
Earthquake	<i>Ongoing</i>		Implement and enforce the Uniform, International, and State Building Codes.
Earthquake	<i>Ongoing</i>		Inspect and/or certify all new construction.
Earthquake	<i>Ongoing</i>		Develop public outreach program to train earthquake safety; perform drop-cover-hold drills at schools and public facilities.
Earthquake	<i>Ongoing</i>		Develop outreach program to educate population concerning household, business, and public facility mitigation measures. For example, staff public information tables at fairs, safety events, and festivals.
Earthquake	<i>Ongoing</i>		Develop outreach program to educate residents concerning benefits of increased seismic resistance and modern building code compliance during rehabilitation or major repairs for residences or businesses.
Earthquake	<i>Ongoing</i>		Inspect, prioritize, and retrofit any critical facility or public infrastructure that does not meet current Building Codes.
Earthquake	<i>Ongoing</i>		Identify and prioritize a list of critical facilities with unreinforced masonry problems including non-structural

**Table G-12. City of Scappoose Mitigation Actions Considered**

<b>Hazard</b>	<b>Status</b>	<b>Comment</b>	<b>Description</b>
			projects such as brick chimney bracing or replacement, water heater bracing, and anchoring, etc.
Earthquake	<i>Ongoing</i>		Evaluate critical public facility seismic performance for fire stations, public works buildings, potable water systems, wastewater systems, electric power systems, and bridges within the jurisdiction.
Earthquake	Consider		Develop outreach program for educating private facilities concerning alternative or emergency power source acquisition to enable them to deliver food, fuel, and medical services during disaster emergency response and recovery efforts.
Earthquake	<i>Ongoing</i>		Encourage utility companies to evaluate and harden vulnerable infrastructure elements for sustainability.
Earthquake	<i>Ongoing</i>		Develop partnerships to mitigate hazards that result in jurisdictional facility lifeline or emergency transportation route closures.
<b>Volcano</b>			
Volcano	<i>Ongoing</i>		Update public emergency notification procedures and develop an outreach program for ash fall events.
Volcano	<i>Ongoing</i>	<b>1 City Admin/PW/ PD/FD/School D/Utilities</b>	Update emergency response planning and develop client focused outreach program for ash fall events affecting river, air, and highway transportation, and industrial facilities and operations.
Volcano	Consider		Evaluate capability of water treatment plants to deal with high turbidity from ash falls, update emergency response plans, and upgrade treatment facilities' physical plant to deal with ash falls. Prioritize and initiate actions to fill capability gaps.
Volcano	Consider		Evaluate ash impact on storm water drainage system and develop mitigation actions.
<b>Wind</b>			
Wind	<i>Ongoing</i>		Review ordinances and develop outreach programs to assure manufactured buildings are protected from severe wind and flood hazards. (Anchoring, elevation, siting, and other methods as applicable)
Wind	<i>Ongoing</i>	<b>City Admin/PW</b>	Identify using GIS and prioritize critical facilities' overhead utilities that could be placed underground to reduce power disruption from wind storm / tree blow down damage.
Wind	<i>Ongoing</i>		Revise requirements to place utilities underground to reduce power disruption from wind storm / tree blow down damage when upgrading or during new development.
Wind	<i>Ongoing</i>		Increase power line wire size and incorporate quick disconnects (break away devices) to reduce ice load power line failure during severe wind or winter ice storm events.
<b>Erosion</b>			
Erosion	<i>Ongoing</i>		Maintain and update erosion hazard locations, identify critical facilities potentially impacted and develop mitigation initiatives such as bank stabilization or facility relocation to prevent or reduce the threat.
Erosion	Consider		Relocate buildings that are at risk of being affected by erosion.

**Table G-12. City of Scappoose Mitigation Actions Considered**

<b>Hazard</b>	<b>Status</b>	<b>Comment</b>	<b>Description</b>
Erosion	<i>Ongoing</i>	<b>1</b> <b>City Admin</b> <b>PW</b> <b>Scappoose Bay</b> <b>Watershed</b> <b>Council</b>	Apply for grants/funds to implement stream bank protection methods.
Erosion	<i>Ongoing</i>		Hold series of community meetings and other outreach efforts to provide erosion hazard specific information to residents.
Erosion	<i>Ongoing</i>		Develop and provide information to all residents on riverbank erosion and methods to prevent it in an easily distributed format
Erosion	<i>Ongoing</i>		Develop outreach program to educate the public concerning planting processes and materials used to stabilize hill slopes or stream banks. This is known as bio-engineering; which uses logs, root wads, or wood debris or other vegetation to reduce scour and erosion.
Erosion	Consider		Harden culvert entrance bottoms to reduce erosion or scour.
Erosion	<i>Ongoing</i>	<b>2</b> <b>City Admin</b> <b>PW</b> <b>Scappoose Bay</b> <b>Watershed</b> <b>Council</b>	Install embankment protection such as vegetation and other bio-engineered materials to reduce or eliminate erosion.
Erosion	Consider		Install walls at the end of a drainage structure to prevent embankment erosion at its entrance or outlet. (end walls).
Erosion	<i>Ongoing</i>		Construct a rock or concrete structure to dissipate energy or reduce flow velocity to prevent erosion of the streambed and banks.
Erosion	<i>Ongoing</i>		Install flared outlets or end sections at culvert entrances and outlets to match the embankment slope to reduce erosion and scour at the entrance and exit points during high flow.
Erosion	Consider		Install bank revetment protection to prevent erosion.
<b><i>Drought</i></b>			
Drought	<i>Ongoing</i>	<b>1</b> <b>City Admin</b>	Develop educational programs and initiatives related to water conservation and irrigation during drought periods.
<b><i>Dam Failure</i></b>			
Dam Failure	Consider		Prepare high resolution dam failure inundation area maps; use to update emergency response plans, evacuation route identification, public notification, and evacuation procedures.
Dam Failure	<i>Ongoing</i>		Encourage the USACOE to prioritize dams according to hazard risks such as seismic vulnerability and make seismic improvements as necessary.



**Table G-12. City of Scappoose Mitigation Actions Considered**

<b>Hazard</b>	<b>Status</b>	<b>Comment</b>	<b>Description</b>
Dam Failure	Consider		Implement land use and management strategies where dam failure threats dictate.
Dam Failure	Consider		Encourage the USACOE to conduct assessments for dams upstream of heavily populated areas.
Dam Failure	<i>Ongoing</i>	<b>1 City Admin/PW/ Scappoose Drainage Corp</b>	Evaluate the adequacy of dike systems for both floods and earthquakes and implement mitigation measures as necessary.
<b>Disruption of Utility and Transportation Systems (DUTS)</b>			
DUTS	<i>Ongoing</i>	<b>1 City Admin PD/FD/PW/School District/Utilities</b>	Develop outreach program to educate and encourage residents to maintain several days of emergency supplies for power outages or road closures.
DUTS	<i>Ongoing</i>		Review and update emergency response plans for utility disruptions.
DUTS	<i>Ongoing</i>		Review and update emergency response plans for transportation route disruptions.
DUTS	<i>Ongoing</i>		Identify and prioritize all “jurisdiction owned” & “non-jurisdiction owned” critical facilities that have backup power and emergency operations plans.
DUTS	<i>Ongoing</i>		Purchase backup power systems for all identified critical facilities.
<b>Hazardous Materials (HAZMAT)</b>			
HAZMAT	Consider		Annually review and update HAZMAT inventories and ensure that emergency responders are trained for site-specific incidents.
HAZMAT	<i>Ongoing</i>	<b>1 City Admin PD/FD/PW/ School District</b>	Enhance emergency planning, emergency response training, and equipment acquisition to address hazardous materials incidents for emergency and first responders and public works staff.
HAZMAT	<i>Ongoing</i>		Evaluate existing security measures for sites with large quantities of hazardous substances (HS) or any quantities of extremely hazardous substances (EHS) and enhance security as necessary.
HAZMAT	<i>Ongoing</i>		Evaluate seismic bracing/anchoring for sites with large quantities of hazardous substances (HS) or any quantities of extremely hazardous substances (EHS).
HAZMAT	Consider		Train Public Works staff to identify extremely hazardous substances (EHS) and to follow EMS protocols.
HAZMAT	Consider		Develop outreach program to educate the public regarding chemical hazards, safe handling, storage, and disposal procedures.
HAZMAT	Consider		Research, develop, and implement methods to protect waterways from hazardous materials events.
HAZMAT	<i>Ongoing</i>		Prepare a site-specific summary of hazardous materials used, stored, and commonly transported in the jurisdictional area. The summary should include mapped facility locations with a hazardous materials inventory,

**Table G-12. City of Scappoose Mitigation Actions Considered**

Hazard	Status	Comment	Description
			emergency response protocols, and mitigation actions.
<i><b>Terrorism</b></i>			
Terrorism	<i><b>Ongoing</b></i>	<b>1 City Admin PD/FD/PW/School District/Utilities</b>	Enhance emergency planning, organization, equipment, exercise, and emergency response training to address all potential terrorism incidents.
Terrorism	<i><b>Ongoing</b></i>		Upgrade physical security, detection, and response capability for critical facilities using information obtained from hazard assessments and risk analysis. Include water systems and any high-profile facilities such as major timber industry facilities and sites with large quantities of hazardous substances (HS) and extremely hazardous substances (EHS).
<i><b>Infectious Disease Epidemic</b></i>			
Infectious Disease Epidemic	<i><b>Ongoing</b></i>	<b>1 County Public Health Department PD/FD/School D</b>	Develop a public health emergency response operations plan that includes, but is not limited to, identification and an inventory of sites with the capacity to treat large numbers of infected individuals and identification of a quarantine facility.
Infectious Disease Epidemic	<i><b>Ongoing</b></i>		Identify sectors of the population that are vulnerable to potential infectious diseases and develop strategies to communicate and serve those identified populations.
Infectious Disease Epidemic	<i><b>Ongoing</b></i>		Determine public health authorities and responsibilities during disaster and emergency situations, e.g., quarantine, shelter hygiene, public sanitation, and immunization.
Infectious Disease Epidemic	<i><b>Ongoing</b></i>		Research and obtain necessary specialized training for public health officials to respond to an infectious disease epidemic.
Infectious Disease Epidemic	<i><b>Ongoing</b></i>		Identify state and federal resources for establishing and improving public health response capacity.
Infectious Disease Epidemic	<i><b>Ongoing</b></i>		Identify appropriate manpower to respond to an infectious disease epidemic.

## EVALUATING AND PRIORITIZING MITIGATION ACTIONS

The following section defines mitigation action evaluation and implementation as stipulated in DMA 2000 and its implementing regulations.

### DMA 2000 Requirements: Mitigation Strategy - Implementation of Mitigation Actions

#### Implementation of Mitigation Actions

**Requirement: §201.6(c)(3)(iii):** [The mitigation strategy section shall include] an action plan describing how the actions identified in section (c)(3)(ii) will be prioritized, implemented, and administered by the local jurisdiction. Prioritization shall include a special emphasis on the extent to which benefits are maximized according to a cost benefit review of the proposed projects and their associated costs.

#### Element

- Does the new or updated mitigation strategy include how the actions are prioritized? (For example, is there a discussion of the process and criteria used?)
- Does the new or updated mitigation strategy address how the actions will be implemented and administered, including the responsible department, existing and potential resources, and the timeframe to complete the action?
- Does the new or updated prioritization process include an emphasis on the use of a cost-benefit review to maximize benefits?
- Does the updated plan identify the completed, deleted, or deferred mitigation actions as a benchmark for progress, and if activities are unchanged (i.e., deferred), does the updated plan describe why no changes occurred?

Source: FEMA, July 2008.

The Steering Committee met on April 10, 2014 to evaluate and prioritize each of the mitigation actions to determine which considered actions would be included in the Mitigation Action Plan. The Committee then conferred on multiple dates to determine the responsible agency and potential funding sources. The Mitigation Action Plan represents mitigation projects and programs to be implemented through the cooperation of multiple entities.

To complete this task, the Steering Committee reviewed the simplified STAPLEE evaluation criteria and the Benefit-Cost Analysis Fact Sheet (Appendix N) to consider the opportunities and constraints of implementing each particular mitigation action.

<b>STAPLEE Evaluation Criteria for Mitigation Actions</b>		
<b>Evaluation Category</b>	<b>Discussion “It is important to consider...”</b>	<b>Considerations</b>
<b>Social</b>	The public support for the overall mitigation strategy and specific mitigation actions.	Community acceptance Adversely affects population
<b>Technical</b>	If the mitigation action is technically feasible and if it is the whole or partial solution.	Technical feasibility Long-term solutions Secondary impacts
<b>Administrative</b>	If the community has the personnel and administrative capabilities necessary to implement the action or whether outside help will be necessary.	Staffing Funding allocation Maintenance/operations

**Appendix G**  
**City of Scappoose**

<b>STAPLEE Evaluation Criteria for Mitigation Actions</b>		
<b>Evaluation Category</b>	<b>Discussion “It is important to consider...”</b>	<b>Considerations</b>
<b>Political</b>	What the community and its members feel about issues related to the environment, economic development, safety, and emergency management.	Political support Local champion Public support
<b>Legal</b>	Whether the community has the legal authority to implement the action, or whether the community must pass new regulations.	Local, State, and Federal authority Potential legal challenge
<b>Economic</b>	If the action can be funded with current or future internal and external sources, if the costs seem reasonable for the size of the project, and if enough information is available to complete a FEMA Benefit-Cost Analysis.	Benefit/cost of action Contributes to other economic goals Outside funding required FEMA Benefit-Cost Analysis
<b>Environmental</b>	The impact on the environment because of public desire for a sustainable and environmentally healthy community.	Effect on local flora and fauna Consistent with community environmental goals Consistent with local, State, and Federal laws

Upon review, the Steering Committee assigned a high priority ranking to actions that best fulfill the goals of the MHMP and are appropriate and feasible for the City and responsible entities to implement during the 5-year lifespan of this version of the MHMP. As such, the Steering Committee determined that only the mitigation actions that received a high priority ranking would be included in the City’s Mitigation Action Plan. Table G-14 depicts the City’s mitigation actions grouped by hazard and in descending priority order within each hazard.

**MITIGATION GOALS AND ACTIONS PRIORITIZED & ASSIGNED**

The City of Scappoose reviewed the Columbia County goals and determined they meet the City’s needs and subsequently implemented the Goals in Table G-13 for the current planning period.

<b>Table G-13. City of Scappoose Mitigation Goals</b>	
<b>Goal Number</b>	<b>Goal Description</b>
1	<p><b>Reduce the Threat to Life Safety</b> Enhance life safety by minimizing the potential for deaths and injuries in future disaster events.</p>
2	<p><b>Protect Critical Facilities and Enhance Emergency and Essential Services</b></p> <ul style="list-style-type: none"> <li>• Implement activities or projects to protect critical facilities and infrastructure.</li> <li>• Seek opportunities to enhance, protect, and integrate emergency and essential services.</li> <li>• Strengthen emergency operations plans and procedures by increasing collaboration and coordination among public agencies, non-profit organizations, business, and industry.</li> </ul>
3	<p><b>Reduce the Threat to Property</b></p> <ul style="list-style-type: none"> <li>• Seek opportunities to protect, enhance and integrate emergency and essential services.</li> <li>• Strengthen emergency operations plans and procedures by increasing collaboration and coordination among public agencies, non-profit organizations, business, industry and the citizens of Columbia County.</li> </ul>
4	<p><b>Create a Disaster Resistant and Disaster-Resilient Economy</b></p> <ul style="list-style-type: none"> <li>• Develop and implement activities to protect economic well-being and vitality while reducing economic hardship in post disaster situations.</li> <li>• Reduce insurance losses and repetitive claims for chronic hazard events.</li> <li>• Work with State and Federal Partners to reduce short-term and long-term recovery and reconstruction costs.</li> <li>• Work with local organization, such as Columbia Emergency Planning Association (CEPA).</li> <li>• Expedite pre-disaster and post-disaster grants and program funding.</li> </ul>
5	<p><b>Increase Public Awareness, Education, Outreach, and Partnerships</b></p> <ul style="list-style-type: none"> <li>• Coordinate and collaborate, where possible, risk reduction outreach efforts with the Oregon Partners for Disaster Resistance &amp; Resilience and other public and private organizations.</li> <li>• Develop and implement risk reduction education programs to increase awareness among citizens, local, county, and regional agencies, non-profit organizations, business, and industry.</li> <li>• Promote insurance coverage for catastrophic hazards</li> <li>• Strengthen communication and coordinate participation in and between public agencies, citizens, nonprofit organizations, business, and industry.</li> </ul>

## IMPLEMENTING A MITIGATION ACTION PLAN

The following section defines the mitigation action identification process for each participating jurisdiction as stipulated in DMA 2000 and its implementing regulations.

**DMA 2000 Requirements: Mitigation Strategy-Identification of Multi-Jurisdictional Mitigation Actions**

**Identification of Multi-Jurisdictional Mitigation Actions**

**Requirement §201.6(c)(3)(iv):** For multi-jurisdictional plans, there must be identifiable action items specific to the jurisdiction requesting FEMA approval or credit of the plan.

**Element**

- Does the new or updated plan include identifiable action items for each jurisdiction requesting FEMA approval of the plan?
- Does the updated plan identify the completed, deleted or deferred mitigation actions as a benchmark for progress, and if activities are unchanged (i.e., deferred), does the updated plan describe why no changes occurred?

Source: FEMA, July 2008.

This appendix identifies action items specific to the City of Scappoose. Since the update includes incorporation of the City of Scappoose as part of the MHMP, all actions in this appendix are considered new. Table G-14 displays the City of Scappoose's Mitigation Action Plan matrix that lists mitigation actions by hazard and prioritizes actions within each hazard. Actions are not prioritized in total. Each mitigation action will be implemented and administered by the applicable managing department, agency, or responsible entity.

*\*\*Whenever TBD is used, it means that a benefit/cost analysis will be completed as a project is developed to validate the most appropriate mitigation action.*

**Table G-14. City of Scappoose Mitigation Action Plan Matrix**

Hazard	Description	Managing Department / Agency	Timeframe	Potential Funding Source(s)	Benefit-Costs / Technical Feasibility	Comments
<i>Multi-Hazard (MH)</i>						
MH	Acquire, demolish, or relocate structures from hazard prone area. Property deeds shall be restricted for open space uses in perpetuity to keep people from rebuilding in hazard areas.	City Admin/PW	Ongoing	Sewer Fund, FMA, HMGP, PDM	BC: TBD TF: Yes	
MH	Identify and pursue funding opportunities to implement mitigation actions.	City Admin	Ongoing	General Fund	BC: TBD TF: Yes	
<i>Flood</i>						
Flood	Develop and maintain GIS mapped inventory of repetitive loss properties to include the types and numbers of properties.	City Admin/PW	Ongoing	General Fund	BC: TBD TF: Yes	
Flood	Develop and implement mitigation actions for repetitive loss properties.	City Admin/PW	Ongoing	Sewer Fund, FMA, HMGP, PDM	BC: TBD TF: Yes	
<i>Winter Storm</i>						
Winter Storm	Develop critical facility list needing emergency back-up power systems, prioritize, seek funding and implement mitigation actions.	City Admin/PW/ PD/Fire District	Ongoing	General Fund	BC: TBD TF: Yes	
Winter Storm	Develop and maintain severe winter storm public outreach program defining mitigation activity benefits through educational outreach aimed at households and businesses while targeting of special needs populations.	City Admin/PW/ PD/Fire District	Ongoing	General Fund, HMGP	BC: TBD TF: Yes	

**Table G-14. City of Scappoose Mitigation Action Plan Matrix**

Hazard	Description	Managing Department / Agency	Timeframe	Potential Funding Source(s)	Benefit-Costs / Technical Feasibility	Comments
<i><b>Landslide</b></i>						
Landslide	Complete a landslide location inventory, identify threatened critical facilities and other buildings and infrastructure using GIS.	City Admin/PW	Ongoing	General Fund	BC: TBD TF: Yes	
<i><b>Wildland Fire</b></i>						
Wildland Fire	Develop outreach program to educate and encourage fire-safe construction practices for existing and new construction in high risk areas.	City Admin Fire District	Ongoing	General Fund, FMAP	BC: TBD TF: Yes	
Wildland Fire	Develop, adopt, and enforce burn ordinances that require burn permits, restricts campfires, and controls outdoor burning.	City Admin Fire District	Ongoing	General Fund	BC: TBD TF: Yes	
<i><b>Earthquake</b></i>						
Earthquake	Use GIS to identify high seismic hazard areas and develop a wood-frame residential building inventory and an outreach program to educate population concerning facilities particularly vulnerable to earthquake damage, such as pre-1940s homes and homes with cripple wall foundations.	City Admin /PW/PD/FD/School District/Utilities	Ongoing	General Fund	BC: TBD TF: Yes	
Earthquake	Update existing (or adopt the most current) Uniform Building Code	City Admin /PW/PD/FD/School District/Utilities	Ongoing	General Fund	BC: TBD TF: Yes	
<i><b>Volcano</b></i>						
Volcano	Update emergency response planning and develop client focused outreach program for ash fall events affecting river, air, and highway transportation, and industrial facilities and operations.	City Admin /PW/PD/FD/School District/Utilities	Ongoing	General Fund, NOAA/ NWS, HMGP	BC: TBD TF: Yes	



**Table G-14. City of Scappoose Mitigation Action Plan Matrix**

Hazard	Description	Managing Department / Agency	Timeframe	Potential Funding Source(s)	Benefit-Costs / Technical Feasibility	Comments
<i>Wind</i>						
Wind	Use GIS to identify and prioritize critical facilities' overhead utilities that could be placed underground to reduce power disruption from wind storm / tree blow down damage.	City Admin /PW	Ongoing	General Fund	BC: TBD TF: Yes	
<i>Erosion</i>						
Erosion	Apply for grants/funds to implement stream bank protection methods.	City Admin /PW/Scappoose Bay Watershed Council	Ongoing	General Fund	BC: TBD TF: Yes	
Erosion	Install embankment protection such as vegetation and other bio-engineered materials to reduce or eliminate erosion.	City Admin /PW/Scappoose Bay Watershed Council	Ongoing	General Fund, HMA, HMGP	BC: TBD TF: Yes	
<i>Drought</i>						
Drought	Develop educational programs and initiatives related to water conservation and irrigation during drought periods.	City Admin	Ongoing	General Fund	BC: TBD TF: Yes	
<i>Dam Failure</i>						
Dam Failure	Evaluate the adequacy of dike systems for both floods and earthquakes and implement mitigation measures as necessary.	City Admin /PW/Scappoose Drainage Corp	Ongoing	General Fund	BC: TBD TF: Yes	
<i>Disruption of Utility and Transportation Systems (DUTS)</i>						
(DUTS)	Develop outreach program to educate and encourage residents to maintain several days of emergency supplies for power outages or road closures.	City Admin PD/FD/PW/School District/Utilities	Ongoing	General Fund	BC: TBD TF: Yes	

**Table G-14. City of Scappoose Mitigation Action Plan Matrix**

Hazard	Description	Managing Department / Agency	Timeframe	Potential Funding Source(s)	Benefit-Costs / Technical Feasibility	Comments
<i>Hazardous Materials (HAZMAT)</i>						
HAZMAT	Enhance emergency planning, emergency response training, and equipment acquisition to address hazardous materials incidents for emergency and first responders and public works staff.	City Admin PD/FD/PW/School District/Utilities	Ongoing	General Fund, CERCLA, SARA	BC: TBD TF: Yes	
<i>Terrorism</i>						
Terrorism	Enhance emergency planning, organization, equipment, exercise, and emergency response training to address all potential terrorism incidents.	City Admin PD/FD/PW/School District/Utilities	Ongoing	General Fund, HSGP	BC: TBD TF: Yes	
<i>Infectious Disease Epidemic</i>						
Infectious Disease Epidemic	Develop a public health emergency response operations plan that includes, but is not limited to, identification and an inventory of sites with the capacity to treat large numbers of infected individuals and identification of a quarantine facility.	County Public Health Department (Lead) City Admin PD/FD/School District	Ongoing	General Fund, County CDC Public Health Funds	BC: TBD TF: Yes	

## HISTORY

### Hazard Mitigation Completion 2009-2014

The Scappoose School District replaced the Otto Peterson Elementary School with a new structure meeting all building and seismic codes on July 2010. A backup power generator was installed to operate the Otto Peterson School along with a power generator at the high school(July 2010) for the School District computer system.

The Scappoose Fire District completed a seismic upgrade to the Scappoose Fire Station Feb 2010.

The City of Scappoose installed larger power generators at the waste water treatment plant and the Keys road water treatment plant.