

# Lane County Natural Hazard Mitigation Plan



## **Draft Report for:**

**Lane County, OR**

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# Special Thanks & Acknowledgements

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# Executive Summary

Lane County developed this Natural Hazards Mitigation Plan in an effort to limit future loss of life and property resulting from natural disasters. Natural hazard mitigation is defined as a method of permanently reducing or alleviating the losses of life, property, and injuries resulting from natural hazards through long and short-term strategies. Example strategies include planning, policy changes, programs, projects, and other activities.

The plan provides: (1) a foundation for coordination and collaboration among agencies and the public in the County; (2) identification and prioritization of future mitigation activities; and (3) support in meeting federal planning requirements to qualify for assistance programs. Additionally, the plan recommends a set of actions to prepare for and reduce the risks posed by natural hazards through education and outreach programs, the development of partnerships, and implementation of preventive activities such as land use or watershed management programs.

## How is the Plan Organized?

The Mitigation Plan contains five main sections, hazard annexes, and resource appendices. The main plan document includes the following sections: Introduction, Community Profile, Risk Assessment Summary, Mitigation Plan Goals and Action Items, and Plan Implementation. It also contains a series of 10 hazard-specific annexes covering the following hazards: Winter and Windstorms; Wildfire; Earthquake; Landslide; Flood; Volcanic Event; Dam Safety; Hazardous Materials; Terrorism; and Utility and Transportation, as well as three resource appendices covering benefit cost analysis; existing plans, policies, and programs; and common acronyms.

## Who Participated in Developing the Plan?

This plan is the culmination of several mitigation planning efforts undertaken by Lane County. . The first, in 1996, resulted in a Regional All Hazard Mitigation Master Plan and was a joint effort among Benton, Lincoln, and Linn Counties. The second was the completion of a county-specific hazard assessment, completed in 2003 by Kenneth Goettel and Associates. The third effort took place in 2005 and resulted in the development of a countywide Community Wildfire Protection Plan or CWPP. The County contracted with the Community Service Center's Oregon Natural Hazards Workgroup (ONHW) at the University of Oregon to develop this plan. Building upon these initial efforts, Lane County convened a steering committee to guide the development of the natural hazards mitigation plan. The steering committee was responsible for making decisions and agreeing upon the final contents of the plan. Members of the steering committee included representatives from the following agencies:

- Lane County Emergency Management
- Lane County Land Management Division
- Oregon Department of Forestry – East Lane and South Cascade Districts
- Lane County Public Works, GIS and Roads Units
- United States Forest Service
- Bureau of Land Management
- Eugene Water and Electric Board
- Springfield Utility Board

## **What are the Plan Goals?**

The plan goals help to guide the direction of future activities aimed at reducing risk and preventing losses from natural hazards. The goals listed here serve as the guiding principles for agencies and organizations as they begin implementing action items. Each goal includes a goal statement, which serves to further explain how each of the plan’s goals will assist in mitigating the effects of natural hazards within Lane County. The goals of the Lane County Natural Hazard Mitigation Plan are to:

1. Save lives and reduce injuries
2. Minimize and prevent damage to buildings and infrastructure
3. Reduce economic loss
4. Decrease disruption to services
5. Protect natural and cultural resources
6. Increase awareness and understanding of the hazards and risks in Lane County

## **How are the Action Items Organized?**

The plan identifies action items developed through various plan inputs, data collection and research. The action items identified by the plan are intended to move the County towards achieving the plan’s goals. Action items address both multi-hazard (MH) and hazard-specific issues.

To facilitate implementation, each action item is described in a worksheet, which includes information on key issues addressed, ideas for implementation, coordinating and partner organizations, timeline, and plan goals addressed.

## **How Will the Plan be Implemented?**

The Lane County Natural Hazards Mitigation Plan was developed and will be implemented through a collaborative process. The Plan will be adopted via resolution by the Lane County Board of Commissioners.

Upon approval by FEMA and local adoption, Lane County will gain eligibility for the Pre-Disaster Mitigation Grant Program, as well as Hazard Mitigation Grant Program and Flood Mitigation Assistance program funds. The effectiveness of Lane County's non-regulatory Natural Hazards Mitigation Plan will be contingent upon implementation of the plan and incorporation of the identified action items into existing Lane County plans, policies, and programs.

## **Coordinating Body**

The Disaster Policy Council will act as the coordinating body and serve as a centralized resource for natural hazard issues and risk reduction in Lane County. Additional roles and responsibilities of the committee include:

- Serving as the local evaluation committee for funding programs such as Pre-Disaster Mitigation Grant Program, the Hazard Mitigation Grant Program funds, and Flood Mitigation Assistance program funds;
- Prioritizing and recommending funding for natural hazard risk reduction projects;
- Documenting successes and lessons learned;
- Evaluating and updating the Natural Hazards Mitigation Plan in accordance with the prescribed maintenance schedule, (See Table 5.1); and
- Developing and coordinating ad hoc and/or standing subcommittees as needed.

## **Co-Conveners**

Lane County Emergency Management and the Lane County Land Management Division will serve as co-conveners to oversee the plan's implementation and maintenance. These two entities will be responsible for calling meetings to order at scheduled times or when issues arise, (e.g., when funding becomes available or following a major natural hazard event).

Emergency Management roles:

- Coordinate Disaster Policy Council meeting dates, times, locations, agendas, and member notification;
- Document outcomes of Committee meetings;
- Serve as a communication conduit between the Disaster Policy Council and key plan stakeholders; and
- Identify emergency management-related funding sources for natural hazard mitigation projects.

Land Management roles:

- Incorporate, maintain, and update Lane County's natural hazards risk GIS data elements; and

- Utilize the Lane County Natural Hazards Risk Assessment as a tool for prioritizing proposed natural hazard risk reduction projects.

## **Project Prioritization**

The Disaster Mitigation Act of 2000 requires that the plan identify a process for prioritizing potential actions. Such actions often come from a variety of sources; therefore, the project prioritization process needs to be flexible. The prioritization process outlined in the plan utilizes a four-step process to help ensure that limited mitigation funding is used in a cost-effective manner. The four steps include:

1. Examining funding requirements;
2. Completing a risk assessment evaluation;
3. Completing quantitative or qualitative assessments and economic analysis; and
4. Providing a recommendation.

## **Plan Maintenance and Update**

The plan includes a schedule and recommended tasks to assist the County in maintaining and updating the plan. The schedule includes annual meetings as well as a five-year update.

# Section 1

## Introduction

Lane County developed this Natural Hazards Mitigation Plan in an effort to limit future loss of life and property resulting from natural disasters. It is impossible to predict exactly when these disasters might occur, or the extent to which they could affect the County. However, with careful planning and collaboration among public agencies, private sector organizations, and citizens within the community, it is possible to minimize the losses that can result from natural disasters.

A natural disaster occurs when a natural hazard impacts people or property and creates adverse conditions within a community. Natural hazards include: floods, earthquakes, extreme weather, and wildfire, and each has the potential to harm people or property.<sup>1</sup> This plan focuses on the primary natural hazards that could affect Lane County, Oregon, which include earthquake, flood, landslide, wildfire, windstorm, and winter storm.

### Why Update the County's Mitigation Plan?

The dramatic increase in the costs associated with natural disasters over the past decades has fostered interest in identifying and implementing effective means of reducing vulnerability. This Natural Hazards Mitigation Plan is intended to assist the County in reducing its risk of damage from natural hazards by identifying resources, information, and strategies for risk reduction. It will also help to guide and coordinate mitigation activities throughout the County.

The plan is non-regulatory in nature, meaning that it does not set forth any new policy. It does, however, provide: (1) a foundation for coordination and collaboration among agencies and the public in the County; (2) identification and prioritization of future mitigation activities; and (3) support in meeting federal planning requirements to qualify for assistance programs. The mitigation plan works in conjunction with other County plans and programs, including the Comprehensive Land Use Plan, Emergency Response and Recovery Plans, Economic Development Strategic Plan, Capital Improvement Plan, and the State of Oregon Natural Hazards Mitigation Plan.

The plan provides a set of actions to prepare for and reduce the risks posed by natural hazards through education and outreach programs, the development of partnerships, and implementation of preventive activities such as land use or watershed management programs. The actions described in the plan are intended to be implemented through existing plans and programs within the County.

## Brief Mitigation Planning History for Lane County

This plan is not the first effort the County has undertaken toward natural hazard mitigation. Its previous efforts can be categorized into the following four phases:

**Phase One:** In 1996, the County partnered with Benton, Lincoln, and Linn Counties to complete a Regional All Hazard Mitigation Master Plan. The counties contracted with a consultant who completed the plan in December 1998. The finished plan identifies and assesses the counties' risk and vulnerability to the following hazards: floods, winter storms, landslides, and the disruption of utility and transportation systems. The plan additionally provides recommended mitigation projects to reduce the counties' risk to each hazard.

**Phase Two:** Recognizing a need to update the County's risk assessment information specific to Lane County, the County contracted with Kenneth Goettel and Associates in 2003 to complete county-specific hazard assessments for floods, winter storms, landslides, wildland-urban interface fires, earthquakes, volcanic events, utility-transportation disruption, hazardous materials, terrorism, and dam safety.

**Phase Three:** In fall 2004, the County completed a county-wide, multi-jurisdictional Community Wildfire Protection Planning process. The County contracted with the Community Service Center's Oregon Natural Hazards Workgroup (ONHW) at the University of Oregon to develop a plan. The finalized Community Wildfire Protection Plan is a proactive document that recognizes the need for shared responsibility in protecting the county from wildland-urban interface fire, recommends collaborative actions to mitigate the county's risk, and serves as the Wildfire Annex of the Lane County All-Hazards Plan.

**Phase Four:** The Disaster Mitigation Act of 2000 (DMA 2000) is the latest federal legislation addressing mitigation planning. This legislation reinforces the importance of mitigation planning and emphasizes planning for disasters before they occur. The Act established a Pre-Disaster Mitigation program to address this issue. In fall 2004, the ONHW at the University of Oregon partnered with the Department of Geology and Mineral Industries (DOGAMI) and Mid/Southern Willamette Valley Region (Benton, Lane, Linn, Marion, Polk, and Yamhill counties) to develop a Pre-Disaster Mitigation grant proposal for the Mid/Southern Willamette Valley Region. Each county joined the Partners for Disaster Resistance & Resilience (*The Partnership*) by signing (through their county commissions) a Memorandum of Understanding for this project.

The Mid/Southern Willamette Valley Region grant was awarded to support the development of natural hazard mitigation plans for the six counties in the region. The region's planning process utilized a

seven-step procedure and technical resources developed by ONHW and *The Partnership*.

## What is Natural Hazard Mitigation?

Natural hazard mitigation is defined as permanently reducing or alleviating the losses of life, property, and injuries resulting from natural hazards through long- and short-term strategies. Example strategies include planning, policy changes, programs, projects, and other activities. Mitigation is the responsibility of individuals, private businesses and industries, state and local governments, and the federal government.<sup>2</sup> The action items in this plan are assigned to a number of these stakeholders, reflecting the diversity of mitigation responsibility.

Engaging in mitigation activities provides jurisdictions with a number of benefits, including reduced loss of life, property, essential services, critical facilities and economic hardship; reduced short-term and long-term recovery and reconstruction costs, increased cooperation and communication within the community through the planning process; and increased potential for state and federal funding for recovery and reconstruction projects.

## Who Will the Plan Affect?

Lane County's size and diversity of geography, population, and land management practices mean that the threat of natural hazards is not uniform across the County. The plan identifies general areas at high risk to earthquakes, floods, landslides, winter storms, windstorms and wildfires, and recommends actions the County can take to reduce its risk. The plan affects the County and a portion of its urban service area, and addresses the ways in which the County can mitigate the threat to life, property, and resources caused by the natural hazards present throughout the County. Through risk identification and the recommendation of risk-reduction actions, the plan aligns with the goals of the County's Strategic and Rural Comprehensive Plans, and helps the County meet the requirements of statewide land use planning Goal 7: Areas Subject to Natural Hazards.

While this plan does not establish mandates for the County, it does provide a viable framework for planning for natural hazards. The resources and background information in the plan are applicable countywide, and the goals and recommendations can lay groundwork for the development and implementation of mitigation activities and partnerships.

## Policy Framework for Natural Hazards in Oregon

Planning for natural hazards is an integral element of Oregon's statewide land use planning program, which was instituted in 1973. All Oregon cities and counties have comprehensive plans and implementing ordinances that are required to comply with statewide

planning goals. The challenge faced by state and local governments is to keep this network of local plans coordinated in response to the changing conditions and needs of Oregon communities.

Statewide land use planning Goal 7: Areas Subject to Natural Hazards, calls for local plans to include inventories, policies, and ordinances to guide development in hazard areas. Goal 7, along with other land use planning goals, has helped to reduce losses from natural hazards.

The primary responsibility for the development and implementation of risk reduction strategies and policies lies with local jurisdictions. However, some resources exist at the state and federal levels. Key agencies in this area include Oregon Emergency Management (OEM), Oregon Building Codes Division (BCD), Oregon Department of Forestry (ODF), Oregon Department of Geology and Mineral Industries (DOGAMI), and the Department of Land Conservation and Development (DLCD).

Section 322 of the Disaster Mitigation Act of 2000 (DMA 2000) specifically addresses mitigation planning at the state and local levels. It identifies new requirements that allow HMGP funds to be used for planning activities, and increases the amount of HMGP funding available to states that have developed a comprehensive, enhanced mitigation plan prior to a disaster. States and local communities must have approved mitigation plans in place in order to qualify to receive post-disaster HMGP funds.

## Plan Methodology

Phase four of the Lane County Natural Hazards Mitigation Plan was developed using a planning process created by the Community Service Center's Oregon Natural Hazard Workgroup at the University of Oregon.<sup>3</sup> The planning process was designed to (1) result in a plan that is DMA 2000 compliant, (2) coordinate this plan with the State's plan and activities of the Partners for Disaster Resistance & Resilience: Oregon Showcase State Program, and (3) build a network of jurisdictions and organizations that can play an active role in plan implementation. Following is a summary of major activities included in the planning process.

### Steering Committee:

Building upon phases two and three, the steering committee was convened 4 times between July and September 2005 to guide the development of the natural hazard mitigation plan. The committee played a vital role in developing the mission and goals of the mitigation plan and served as the coordinating body to implement and maintain the plan upon adoption and FEMA approval. The committee comprised representatives of public and private agencies and organizations in the County, including:

- Lane County Emergency Management
- Lane County Land Management Division

- Oregon Department of Forestry – East Lane and South Cascade Districts
- Lane County Public Works, GIS and Roads Units
- United States Forest Service
- Bureau of Land Management
- Eugene Water and Electric Board
- Springfield Utility Board

### **Hazard-specific Information:**

The County recognized the importance of establishing a collaborative planning process to develop both short-term and long-term risk reduction strategies with strong ties to the County’s existing programs and divisions of governance. Therefore, the County worked with stakeholders, individuals and specialists, with natural hazard mitigation understanding and responsibilities from County departments, state agencies, and community organizations in and around Lane County. These stakeholders were able to provide insight on community issues, policies, and programs related to specific natural hazards and assist in identifying potential future action items.

### **Planning Resources**

The County reviewed natural hazard mitigation plans from other jurisdictions, current FEMA planning requirements, the FEMA Pre-Disaster Mitigation Program requirements, and the National Flood Insurance Program’s Community Rating System. Statewide reference materials consisted of community and county mitigation plans, including:

- Regional All Hazards Mitigation Master Plan for Benton, Lane, Lincoln and Linn Counties;
- Douglas County Natural Hazards Mitigation Plan;
- Clackamas County Natural Hazard Mitigation Plan;
- Metro’s Regional Hazard Mitigation Policy and Planning Guide;
- Oregon Natural Hazards Workgroup, Plan Framework (ONHW);
- *Planning for Natural Hazards: Oregon Technical Resource Guide* (DLCD);
- *Natural Hazard Mitigation Plans: An Evaluation Process* (OEM)
- State of Oregon Natural Hazards Mitigation Plan (OEM); and
- Post-Disaster Hazard Mitigation Planning Guidance for State and Local Governments (OEM)
- Partners for Disaster Resistance & Resilience: Oregon Showcase State Initiative’s Community Planning Resources

The County plan builds upon the resources listed above and is based upon the University of Oregon’s Oregon Natural Hazards Workgroup, plan framework and seven-step collaborative planning process.

# Plan Organization

## How is the plan to be used?

Each section of the mitigation plan provides specific information and resources to facilitate understanding of the hazard-specific issues facing Lane County citizens, businesses, and the environment. Combined, the sections work together to form a mitigation plan that guides the plan's mission to research, coordinate and implement risk reduction activities. This plan's structure enables stakeholders to use the section(s) of interest to them.

## Mitigation Action Plan

### Executive Summary

The executive summary provides an overview of the Lane County Natural Hazard Mitigation Plan.

### Section 1: Introduction

The Introduction briefly describes why the plan was updated, what mitigation is, hazard policy framework in the state, and the methodology used to develop the plan. It also includes information about the steering committee's role, and how stakeholders provided input.

### Section 2: Community Profile

The Community Profile briefly describes the County in terms of demographic, economic, and development trends as well as geography and environment, housing and transportation.

### Section 3: Risk Assessment Summary

This section provides information on the five federal requirements for a risk assessment: hazard identification; profiling hazard events; vulnerability assessment/inventorying assets; risk analysis/estimating potential losses; and assessing vulnerability/analyzing development trends. It also includes summaries of the risk assessments for the primary hazards affecting Lane County.

### Section 4: Mitigation Plan Goals, Action Items

This section provides information on the process used to develop the goals and action items in the plan. It also describes the plan's mission, goals and actions, which guide the implementation of mitigation strategies.

### Section 5: Plan Maintenance

This section describes the roles, responsibilities and process associated with implementing, maintaining and updating the plan.

## Hazard-specific Annexes

Hazard-specific annexes, developed in Phase II of the planning process, provide detailed background information on the hazards known to impact Lane County. Each of these annexes includes information about historical impacts, risk assessments, and specific community issues

related to that particular hazard. Hazards are organized into two categories: primary and secondary. Primary hazards are naturally occurring events, such as floods and earthquakes; secondary hazards are those that are either man-made or those that might occur as a secondary effect of a natural hazard, such as utility or transportation disruption. The primary hazards addressed in the plan include:

- *Winter Storm*
- *Wildfire*
- *Earthquake*
- *Landslide*
- *Flood*
- *Volcanic Event*

The secondary hazards presented in the plan include:

- *Utility-Transportation Disruption*
- *Dam Safety*
- *Terrorism*
- *Hazardous Materials*

## **Resource Appendices**

The resource appendices are designed to provide users of the Lane County Natural Hazards Mitigation Plan with additional information to assist them in understanding the contents of the mitigation plan, and potential resources to assist them with implementation.

### **Economic Analysis of Natural Hazard Mitigation Projects**

This appendix describes the Federal Emergency Management Agency's (FEMA) requirements for benefit cost analysis in natural hazards mitigation, as well as various approaches for conducting economic analyses of proposed mitigation activities.

### **Existing Plans, Policies, and Programs in Lane County**

This appendix provides information on the existing plans, policies, and programs within Lane County, and describes how mitigation can be linked to existing efforts.

### **List of Acronyms**

This appendix provides a list of acronyms for county, regional, state and federal agencies, organizations and programs that may be referred to within the Lane County Natural Hazards Mitigation Plan.

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## **Section Endnotes**

<sup>1</sup> Federal Emergency Management Agency. 2002. *How-To Guide #2: Understanding Your Community's Risks; Identifying Hazards; and Determining Risks.*

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<sup>2</sup> Massachusetts Department of Environmental Management. 1999. "Hazard Mitigation: Managing Risks, Lowering Costs."  
<http://www.state.ma.us/dem/programs/mitigate/whatis.htm> Accessed 8/2/02

<sup>3</sup> More information on the Oregon Natural Hazards Workgroup can be found at  
<http://darkwing.uoregon.edu/~onhw>

# Section 2

## Community Profile

### Why Plan for Natural Hazards in Lane County?

In 2000, Congress passed and the President signed the Disaster Mitigation Act of 2000, commonly known as DMA 2000. Under DMA 2000 and rules published in 44 CFR Part 201.6, communities, states, and tribal governments needed to have FEMA-approved natural hazard mitigation plans by November 1, 2004 to be eligible for certain federal assistance programs such as the Hazard Mitigation Grant Program (HMGP).<sup>1</sup>

Lane County's varied landscape ranges from the coast to the Cascades, and natural hazards such as coastal erosion, wildfire, and flooding pose a threat to the county's economy, built environment, and residents. As noted in the following section, heavy winter rainstorms and windstorms, along with occasional severe winter storms, have caused major problems in Lane County in recent history. The County's location near a major earthquake subduction zone places it in danger of experiencing significant earthquake damage, and its proximity to the Cascade mountain range raises the threat of volcanic eruption. Planning for the occurrence of such hazards helps strengthen vital components of the county's infrastructure and minimize the risk and incidence of personal injuries, fatalities, and property damage.

### History of Natural Hazards in Lane County

Lane County is vulnerable to a number of different hazards, including flooding, winter and windstorms, earthquakes, wildfire, landslides, and volcanic eruptions. The following provides a brief history of the impact of these hazards in Lane County.

Flooding is a chronic hazard in Lane County. Significant flooding events impacted the County in 1861, 1890, 1945, 1956, 1964, and 1996. During the 1996 flood event, rising waters in the McKenzie River forced the evacuation of about 1,200 to 1,500 people in low-lying areas of Springfield. In the Springfield/ Thurston area along the McKenzie River, about 35-40 homes, approximately 20 private roads and bridges and 20 vehicles were damaged. A secondary effect of the 1996 flood event was flood-induced landslides. State geologists identified 75 individual landslide events in Mapleton and 51 in Vida.

There have been 14 major winter and windstorms in Lane County in the last 125 years; the most recent event was in 2002.

Over the past 30 years, Lane County has averaged 75 fires, burning 331 acres, per year. While Lane County has not had any significant wildfires in recent history, the conditions necessary to fuel an intense wildfire do exist within the County. On the right day, under the right conditions, Lane County could be a prime candidate for a major wildfire, severely impacting people and property.

No earthquakes in recent history have been centered in Lane County, but the County has felt the impacts of several historical quakes in the area including: the 1993 Scotts Mills and Klamath Falls events as well as the 2001 Seattle quake.

The Eugene/Springfield Metro Area is approximately 50 miles from the nearest volcano (Three Sisters). This distance is great enough that the Eugene/Springfield Metro Area is extremely unlikely to have major impacts from eruptions of any nearby volcanoes.

## **Geography and Climate**

Lane County covers about 4,620 square miles, from the Pacific Coast to the crest of the Cascades. Its size and diverse geography, topography, climate, and other natural attributes such as vegetation, are important factors to consider in planning for natural and manmade hazards.

For the purposes of hazard mitigation planning, Lane County is divided into five main physiographic regions, based on classifications by the National Weather Service:

- The Coast Region, in western Lane County, is characterized by sand dunes and bluffs. This region is the only portion of Lane County subject to coastal hazards such as storm surge flooding and tsunamis. Every winter the Coast Region is exposed to high-speed windstorms that cause significant damage to buildings and infrastructure.
- The Coast Range, in the western portion of Lane County, has a relatively low population, is a heavily forested mountainous area, and is characterized by heavy rainfall, making it susceptible to flooding and landslides.
- The Willamette Valley, in central Lane County, is the most heavily populated area and is characterized by flat or gently rolling topography where the Willamette and McKenzie rivers meet. This area is subject to floods, windstorms and occasional snow/ice storms.
- The Cascade Foothills include the lower elevation portions of the western slopes of the Cascades. This region is generally heavily forested and, in places, is moderately populated. Wildfires and severe winter storms are the most common natural hazards in this area.

- The Cascade Range, in eastern Lane County, is sparsely populated and is characterized by heavily forested slopes, with elevations up to or exceeding 10,000 feet. This includes the western slopes of the Three Sisters Peaks. Moderately heavy rainfalls and extreme winter conditions with heavy snowfalls characterize this area.

The climate in central Lane County is moderate. Mean daily temperatures range from highs of about 82 degrees and lows of about 51 degrees in July and August, to highs of about 46 degrees and lows of about 34- 35 degrees in December and January.<sup>2</sup> The climate for coastal Lane County is moderated by the Pacific Ocean. Summer temperatures are lower than in central Lane County, while winter temperatures are higher. For example, in Florence (data gathered at Honeyman State Park), mean daily temperatures range from highs of about 70 degrees and lows of about 50 degrees in July, August and September, to highs of about 50 degrees and lows of about 38 degrees in December and January.

The average annual rainfall in central Lane County is about 46 inches. Average monthly precipitation varies from about 7 to 8 inches in November through January, to about 0.4 inch in July. Average annual snowfall is only about 6.0 inches. The Coastal and Cascade Ranges receive more than 100 inches of precipitation annually, much of which is in the form of snow during the winter months.<sup>3</sup>

## Population and Demographics

The first European settlers in the area arrived in Eugene and Springfield in 1846 and 1849, respectively, and the two were incorporated as cities in 1862 and 1885. Lane County is now the fourth most populous county in Oregon, with a population of 322,959.<sup>4</sup> In 2004, the population was about 4% higher than in 2000, or about 335,000.

Since 1950, the total population of Lane County has increased approximately 157% as shown in Table 2.1 below.

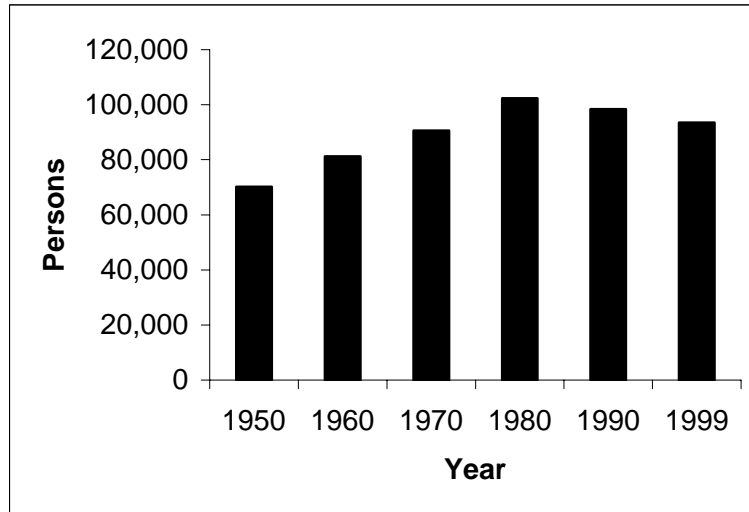
**Table 2.1: Population Growth, Lane County, 1950-2000**

<b>Census</b>	<b>Population</b>	<b>Percent Change</b>
1950	125,776	--
1960	162,890	29.5%
1970	215,401	32.2%
1980	275,226	27.8%
1990	282,912	2.8%
2000	322,959	14.2%

Source: 2000 US Census

Figure 2.1 shows that the unincorporated rural portions of Lane County have grown much more slowly than the county as a whole, with the population increasing by only about 30% between 1950 and 2000.

**Figure 2.1: Rural Population Trends**



Sources: US Census Bureau and Portland State University Center for Population Research and Census.

In 2000, 69% of Lane County residents were living in incorporated areas, while 31% lived in unincorporated areas.

For emergency planning purposes, children, the elderly, the disabled, people living in poverty, and people whose primary language is not English are considered special needs populations. This is because these populations in the community struggle disproportionately in their ability to respond to a disaster. Lane County has a substantial number of residents in all of these special needs categories. Almost 8% of the population speaks a language other than English. Other special needs populations are represented in tables 2.2 – 2.4.

**Table 2.2: Population by Age, Lane County, 2000**

<b>Age Distribution</b>	<b>Percent of Population</b>
Under 5 years	5.8%
Under 18 years	22.9%
18 years and older	77.1%
65 years and older	13.3%

Source: 2000 US Census

**Table 2.3: Disabled Population, Lane County, 2000**

<b>Disabled Residents by Age</b>	<b>Number</b>	<b>Percent of Population</b>
5 to 20 years with a disability	5,973	8.3%
21 to 64 years with a disability	33,657	17.9%
65 years and over with a disability	17,952	42.7%

Source: 2000 US Census

**Table 2.4: Poverty Rates by Age, Lane County, 2000**

<b>Poverty Rate by Age</b>	<b>Number</b>	<b>Percent</b>
All Ages	45423	14.4
Under 5	3741	1.2
5 years	760	0.2
6 to 11 years	4067	1.3
12 to 17 years	3524	1.1
18 to 64 years	30182	9.6
65 to 74 years	1300	0.4
75 years and over	1849	0.6

Source: 2000 US Census

## **Employment and Economics**

The economy of Lane County is largely agrarian in origin; wheat was the first commercial crop. Industrialization began in the 1850s, with the construction of the millrace in Eugene to provide water power for flour mills, lumber mills, and, later, for woolen mills. The Willamette River was the major transportation artery for the region. In the 1870s, development accelerated when the railroad from California reached Eugene. Through the mid-20<sup>th</sup> century, the lumber industry was a very important segment of the local economy. However, by the 1990s, the lumber industry had declined in importance, and economic growth moved to new sectors, including high-tech.

Education has been a major segment of the regional economy since the founding of the University of Oregon in 1872. Over the next century, the addition of several private colleges and Lane Community College increased the contribution of the education sector to Lane County's economy. The distribution of current employment is displayed in Table 2.5.

**Table 2.5: Employment by Industry, Lane County, 2000**

<b>Industry</b>	<b>Percent</b>
Education, health and social services	22.1%
Manufacturing	14.3%
Retail trade	13.7%
Professional, scientific, management, administrative, and waste management services	8.7%
Arts, entertainment, recreation, accommodation, and food services	8.0%
Construction	6.5%
Other services (except public administration)	5.5%
Finance, insurance, real estate, and rental	5.2%
Transportation and warehousing and utilities	4.2%
Wholesale trade	3.7%
Public administration	3.3%
Information	2.5%
Agriculture, forestry, fishing, hunting, and mining	2.3%

Source: 2000 US Census

Median household income can be used as an indicator of the strength of the region's economic stability. In Lane County, the median household income was \$36,942 in 1999, somewhat below the national median income of \$41,994. Although it can be used to compare economic areas as a whole, this figure does not reflect how income is divided among area residents.

## **Housing in Lane County**

Housing development types and year-built dates are important factors in mitigation planning. Certain housing types tend to be less disaster-resistant and warrant special attention: mobile homes, for example, are generally more prone to wind and water damage than standard stick-built homes. In addition, generally the older the home is, the greater the risk of damage from natural disaster. This is because stricter building codes have been developed based on improved scientific understanding of plate tectonics and earthquake risk. For example, structures built after the late 1960s in the Northwest and California used earthquake resistant designs and construction techniques. In addition, FEMA began assisting communities with floodplain mapping during the 1970s, and communities developed ordinances that required homes in the floodplain to be elevated one foot above Base Flood Elevation. Housing characteristics for Lane County are provided in the tables below.

**Table 2.6: Housing Type, Lane County, 2000**

<b>Housing Type</b>	<b>Percent</b>
Single-Family	61%
Multi-Family	27%
Mobile Homes	11%
Boat, RV, Van, etc.	Less than 1%

Source: 2000 US Census

**Table 2.7: Housing Age Structure, Lane County, 2000**

<b>Year Built</b>	<b>Percent</b>
Pre-1939–1959	28%
1960–1979	43%
1980–2000	29%

Source: 2000 US Census

Twenty-eight percent of homes in Lane County were built before recommendations for seismic design were even included as a mandatory design requirement in the Uniform Building Code. More than 71% of homes were built prior to 1984, when Lane County adopted a floodplain management ordinance that minimizes flood risk.

## Land and Development

Development in Lane County radiates outward from the Eugene/Springfield Metropolitan Area, with the most heavily developed rural areas in the Willamette Valley, directly surrounding the metro area. A similar development pattern is evident near the City of Florence, with development extending along the coast and up the Siuslaw River. From these large urban areas, rural development follows a fairly distinct pattern along rivers and lakes and along Highway 101, following the coastline.

Most of the rural population of Lane County is clustered in rural communities. For the most part, these communities are settlements of long historical standing; several were founded more than 100 years ago. Many were developed to support the timber industry or as agricultural centers and therefore grew along major county roads and state highways, often following the river valleys. Thus, many of the rural communities in Lane County have significant portions of their developed areas within or near floodplains.

Other rural communities in Lane County, especially those located outside of the Willamette Valley, are located in or near heavily forested areas. Consequently, many rural communities are at significant risk for wildland or wildland-urban interface fires. By contrast, a relatively small fraction of rural development is in areas with high landslide potential because many of these areas are steep-sloped forestlands, where development is limited.

Portions of some rural communities are, however, within hazard zones for landslides or debris flows.

Local and state policies currently direct growth away from rural lands into Urban Growth Boundaries and, to a lesser extent, into rural communities. The *Lane County Rural Comprehensive Plan* policy calls for the vast majority of the land outside UGBs to continue to be used for farm and forest practices and directs future rural residents primarily to rural communities.

The policy further provides that future development outside existing developed or committed areas be an approved exception to Statewide Planning Goals or otherwise meet Statewide Planning Goal requirements. In accordance with this policy, Lane County may allow conversion of rural lands to non-resource use when it is shown that the lands do not meet state and local criteria for farm and forest designation.

There are about 29,500 addresses in rural Lane County (outside UGBs). More than 90% of these (about 28,000) are in residential use. An additional 1,000 addresses are in commercial/industrial use or categories including religious, educational, utilities, government, and recreation. The remaining 500 are in forest, farm, or parks land use. Potential new residential development in rural Lane County is expected to remain slow. Currently, there are only about 1,500 vacant tax lots designated as residential that are considered buildable and could potentially be developed in the future.

Another 1,136 tax lots are zoned for commercial or industrial use in rural Lane County. Of these, 730 are considered developed (assessed value equal to or greater than \$50,000) and about 400 lots are either not developed or underdeveloped. These 400 lots represent the maximum number that could potentially be developed in the future.

Over the next 50 years, emerging telecommunications services may affect the rural economy, enhancing the capacity of residents in rural areas to access information and deliver services from remote locations. Pressure for rural development may come from people seeking a rural lifestyle, especially workers in the information economy, with remote service capacity, and retirees who do not have the need to commute..

If development follows historical trends, urban areas will expand their UGBs, rural unincorporated communities will continue to grow, and overall rural residential density will increase only slightly, with the bulk of rural lands kept in farm and forest use. The existing pattern of development in rural areas, radiating out

from the urban areas along rivers and streams, is likely to continue. Most of the easily developed land is already developed, leaving more constrained land, such as land in the floodplains or on steep slopes, to be developed in the future. Such development on constrained land could potentially increase the rate at which development occurs in natural hazard areas.

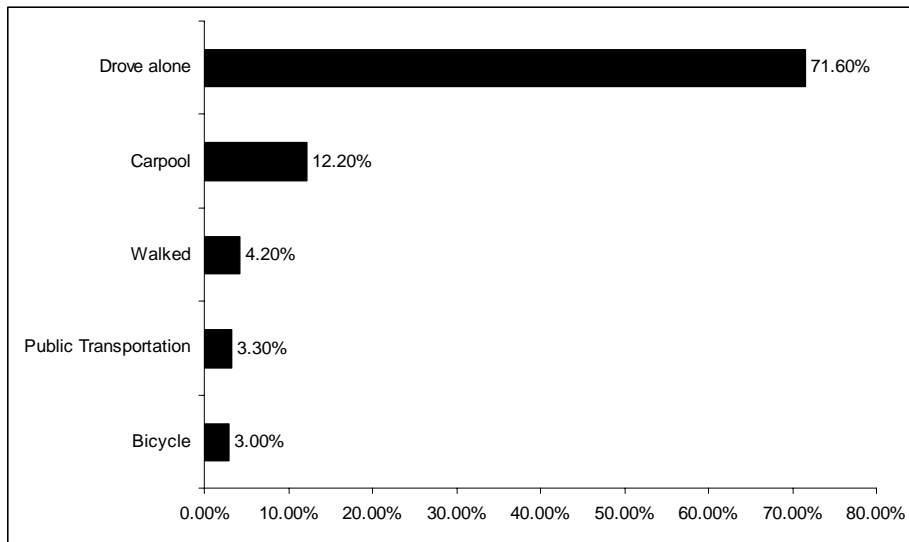
The County does evaluate emergency access when considering development. For the most part (with few exceptions), developers are required to build dwellings near the roadway, partly to provide easier access for emergency vehicles. Larger development proposals must include a storm water management plan for storm water discharge, and development is not allowed to alter an existing waterway. In conformance with National Flood Insurance Program regulations, the County requires that new development in mapped floodplains be at least one foot above the base flood elevation, to reduce the risk of flood damage.

## **Transportation and Commuting Patterns**

The major arterials in Lane County include Interstate 5 and Highway 99, which run North/South through the Willamette Valley; Highway 126, which runs East/West from the Cascades to the Coast; and Highway 101, the Coastal Highway. Numerous state and county roads also crisscross the County. Localized flooding, landslides, and severe winter storm events have historically been sources of disruption to the transportation system in Lane County.

Growth in Lane County will put pressure on both major and minor roads, especially if the main mode of travel is by single occupancy vehicles. How people travel to work is an indicator of the prevalence of single occupancy vehicle travel and thus the amount of traffic congestion and the potential for accidents. Traffic is an important consideration when planning for emergency service provision. Figure 2.2 demonstrates that single occupancy vehicle travel is, by far, the most utilized mode of transit for Lane County residents.

**Figure 2.2: Residents Mode of Travel to Work, Lane County, 2000**



Source: 2000 US Census

Bridges warrant special attention in mitigating the impact of hazards on the transportation system. Most bridges are not seismically retrofitted, creating a significant risk for the commuting population, particularly in an area that may be at risk for earthquakes. Incapacitated bridges can disrupt traffic and exacerbate economic losses because of the inability of industries to transport services and products to clients. The bridges in the region, counted in Table 2.8, are part of the state and interstate highway and maintained by the Oregon Department of Transportation.

**Table 2.8: Bridge Ownership, Lane County, 2004**

<b>Bridge Ownership</b>	<b>Number</b>
State Highway Agency	404
County Highway Agency	432
City/Municipal Highway Agency	65
Historical Covered Bridges	19
<b>Total</b>	<b>920</b>

## **Critical Facilities and Infrastructure**

Critical facilities are those that support government and first responders' ability to take action in an emergency. They are a top priority in any comprehensive hazard mitigation plan. Individual communities in Lane County should inventory their critical facilities to include locally designated shelters and other essential assets, such as fire stations, and water and waste treatment facilities. Aggregate numbers of the most basic types of critical facilities in Lane County are based on county profiles developed for

the State of Oregon Natural Hazard Plan and are provided in Table 2.9.

**Table 2.9: Critical Facilities and Infrastructure, Lane County, 2004**

<b>Critical Facility Types</b>	<b>Number</b>
Hospitals	
Number of Facilities	5
Number of Beds	671
Police Stations	10
Fire & Rescue Stations	19
School Districts & Colleges	9*
Power Plants	2-552 MW
Dams	
Number of Dams	34
Threat Potential	9 high threat

\*7 districts, 1 community college, 1 state university

Dam failures are not uncommon. Fortunately, most failures result in minor damage and pose little or no life-threatening risk. However, the potential for severe damage and fatalities does exist, and the National Inventory of Dams (NID) has developed a listing of High Potential Hazard dams for the nation. There are nine dams within Lane County that warrant this designation.

## Historic and Cultural Resources

According to the National Historic Register, there are 125 historic and cultural sites located in Lane County. These sites range from Native American archeological sites to historic homes, pioneer cemeteries and historic bridges.

<sup>1</sup> DMA 2000, State and Local Plan Criteria: Mitigation Planning Workshop for Local Governments, <[http://www.fema.gov/fima/planning\\_toc4.shtm](http://www.fema.gov/fima/planning_toc4.shtm)>

<sup>2</sup> Oregon State University. 2000. Oregon Climate Service Monthly Means and Extremes. Accessed 4 January 2005 on the world wide web at: <<http://www.ocs.oregonstate.edu/index.html>>

<sup>3</sup> University of Oregon. 1999. Atlas of Lane County. Accessed 4 January 2005 on the world wide web at: <<http://geography.uoregon.edu/infographics/lcweb/precipext.htm>>

<sup>4</sup> United States Census Bureau. 2000. Lane County Population Data. <http://www.census.gov>

# Section 3

## Risk Assessment Summary

An important component of the Lane County Natural Hazards Mitigation Plan is the risk assessment. This section provides a summary of findings that include background information on the process used to develop the risk assessment, as well as overviews of Lane County's risk to only the primary natural hazards addressed by this plan: earthquakes, floods, landslides, wildfires, windstorms, and winter storms. Complete risk assessment information for all hazards can be found in hazard specific annexes at the end of the plan.

### What is a Risk Assessment?

The risk assessment process is used to identify and evaluate the impact of natural hazards on the human-built environment, businesses, social structure and services, and the natural environment of a community. Risk assessments provide information about the areas where the hazards may occur, the value of existing land and property in those areas, and an analysis of the potential risk to life property, and the environment that may result from natural hazard events. Specifically, the following elements are present in a risk assessment:

- 1) **Hazard Identification** identifies the geographic extent of the hazard, the intensity of the hazard, and the probability of its occurrence. Maps are frequently used to display hazard identification data. Lane County identified six major hazard that consistently affect or threaten its geographic area. These hazards – earthquakes, floods, landslides, wildfires, windstorms, and winter storms – were identified through a process that utilized input from a project steering committee, subject matter experts, and historical records (as well as through the Lane County Risk Assessment completed in Phases Two and Three of the County's mitigation planning process).
- 2) **Profiling Hazard Events** describes the causes and characteristics of each hazard, how they have affected Lane County in the past, and what part of Lane County's population, infrastructure, and environment have historically been vulnerable to each specific hazard. A profile of each hazard addressed in this plan is provided in the plan's hazard annexes. For a full description of the history of hazard specific events, please see the hazard specific annex.
- 3) **Vulnerability Assessment/Inventorying Assets** combines the hazard identification with an inventory of existing (or planned) property and population that would be exposed to a hazard. Critical facilities are of particular concern because they provide essential products and services that are necessary to preserve the welfare and quality of life in Lane County and fulfill important

public safety, emergency response, and/or disaster recovery functions.

- 4) ***Risk Analysis/Estimating Potential Losses*** involves estimating the damage, injuries, and financial losses likely to be sustained from hazard events in a geographic area over a given period of time. This level of analysis typically involved using mathematical models, such as HAZUS. The two measurable components of risk analysis are magnitude of the impact that may result from the hazard event and the likelihood of the hazard occurring. Describing vulnerability in terms of dollar losses provides the community and the state with a common framework in which to measure the effects of hazards on assets. Where available, the best available data was used to determine the magnitude and likelihood of future natural hazard events. For each hazard where data was available, quantitative estimates for potential losses are included in the hazard assessment.
- 5) ***Assessing Vulnerability/Analyzing Development Trends*** provides a general description of land uses and development trends within the community so that mitigation options can be considered in future land use decisions. This plan provides a comprehensive description of the characteristics of Lane County in Section 2: Community Profile. This general description includes the geography and climate, population and demographics, employment and economics, land use and development, housing and community development, employment and industry, transportation and commuting patterns, and historic and cultural resources. Analyzing these components of Lane County can help in identifying potential issues or concerns, and can serve as a guide for incorporating the goals and ideas contained in this mitigation plan into other community development plans.

## **Risk Assessment Summary**

This section provides an overview of the risk assessments for the primary hazards affecting Lane County. The risk assessments were developed during Phases Two and Three of the County's mitigation planning process.

### **Earthquake Risk Summary**

Lane County has no occurrences of historic earthquakes centered within the county. However, the *State of Oregon's Natural Hazard Mitigation Plan's* Region 3 (which is comprised of Benton, Lane, Linn, Marion, Polk, and Yamhill counties) has had 5 historic earthquake events centered within the region with magnitudes of 4 or greater.<sup>1</sup> As part of a statewide effort to analyze county risk to various hazards, Lane County has developed an earthquake risk score for itself based on vulnerability and probability of a future earthquake event. Lane County rated itself as having an earthquake risk rating of 175 out of 240. This puts Lane County at an above average risk for earthquakes.<sup>2</sup> The State's hazard assessment identified Lane County's probability of

experiencing a future earthquake as low, that Lane County could expect to have one major earthquake event in the next 75 to 100 years. However, the State's hazard assessment evaluated the vulnerability of the county's population and assets to a future earthquake event as high.<sup>3</sup>

## **Flood Risk Summary**

Lane County has a long history of historic flood occurrences. Historic flooding events have occurred within Lane County in 1945, 1956, 1964, and in 1996. Caused by snow melts and heavy rains, the 1996 floods resulted in the evacuation of residents and damage to buildings, homes, vehicles, roads, and bridges.<sup>4</sup> Lane County rated itself as having an above average flood risk rating of 165 out of 240.<sup>5</sup> This rating is comparable to the state's flood risk assessment of Lane County. The State's hazard assessment indicates that the County's vulnerability to a future flood event is moderate. However, the State's hazard assessment estimated that Lane County was likely to have one major flooding event in the next 10 to 35 years, a high probability for a future flooding event.<sup>6</sup>

## **Landslides**

Landslide events have occurred recently in Lane County's history. The heavy rains that were responsible for the 1996 flood additionally caused landslides in Lane County. Heavy rains in 1998 and 2000 also resulted in landslides that caused road closures in the Deadwood area.<sup>7</sup> At this time neither the County nor the State have developed a rating for Lane County's risk to landslides. However, Lane County does have 24% of all reported landslides statewide. Additionally, the State's hazard assessment estimates that landslides on the local level can be expected every two to three years within Region 3.<sup>8</sup>

## **Wildfire**

Nineteen-ten, 1917, 1922, and 1929 all mark years of historic wildfire events within Lane County. More recently, 44,000 acres of Lane County burned during the 1966 Oxbow Fire.<sup>9</sup> Lane County's self-reported risk rating for wildfire is 180 out of 240. This means that Lane County indicated its vulnerability to, and probability for, wildfire as an above average risk.<sup>10</sup> The State's hazard assessment estimated that Lane County is likely to have a major wildfire in the next 10 to 35 years, a high probability for a future wildfire event. The State's hazard assessment also estimated that Lane County has a high vulnerability to a future wildfire event.<sup>11</sup> The County completed a very thorough risk assessment in spring of 2005. Please refer Lane County's Community Wildfire Protection Plan.

## **Windstorm**

Several historic windstorms, in 1971, 1990, 1995, and including the 1962 Columbus Day Storm, have affected the entire state of Oregon. Windstorms in 1997 and 2002 caused significant damage to western Oregon, including Lane County. Lane County has also experienced tornados in 1951, 1971, 1984, and 1989 that damaged buildings and uprooted trees.<sup>12</sup> The County has rated its own risk vulnerability and potential for windstorms as 190 out of 240, an above average risk to a future windstorm event.<sup>13</sup> The state's risk assessment estimated that Lane County is likely to have a major windstorm in the next 10 to 35 years, a high probability for a future windstorm event. The State's hazard assessment also estimated that Lane County has a high vulnerability to a future windstorm event.<sup>14</sup>

## **Winter Storm**

Winter storms may include windstorms, heavy snowstorms, and ice storms. Historic winter storms have occurred in 1950, 1969, 1980, 1992, 1993, and 1998 and caused damage to buildings, power outages, various accidents, and road closures across the state. During the 1969 storm, Eugene received 47 inches of snow.<sup>15</sup> Lane County has not rated its own risk to winter storm vulnerability and probability. The state's risk assessment estimated that Lane County is likely to have a major winter storm in the next 10 to 35 years, a high probability for a future winter storm event. The State's hazard assessment also estimated that Lane County has a high vulnerability to a future winter storm event.<sup>16</sup>

## **Secondary Hazards**

In addition to the primary hazards that affect Lane County, this plan also addresses the county's risk to secondary hazards: dam safety, hazmat incidents, terrorism, utility and transportation system disruptions, and volcanic hazards. Secondary hazards are those hazards that can affect Lane County, but have a lesser probability of occurrence than the primary hazards that affect the county. Complete risk assessment information on these secondary hazards can be found in hazard specific annexes.

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<sup>1</sup> State Interagency Hazard Mitigation Team. 2004. *State of Oregon Natural Hazard Mitigation Plan*.

<sup>2</sup> [http://mtjune.uoregon.edu/website/hazardmaps/webapp/hazardsViewer\\_content.html](http://mtjune.uoregon.edu/website/hazardmaps/webapp/hazardsViewer_content.html)

<sup>3</sup> State Interagency Hazard Mitigation Team. 2004. *State of Oregon Natural Hazard Mitigation Plan*.

<sup>4</sup> Goettel, Kenneth. 2003. *Lane County Risk Assessment*.

<sup>5</sup> [http://mtjune.uoregon.edu/website/hazardmaps/webapp/hazardsViewer\\_content.html](http://mtjune.uoregon.edu/website/hazardmaps/webapp/hazardsViewer_content.html)

<sup>6</sup> State Interagency Hazard Mitigation Team. 2004. *State of Oregon Natural Hazard Mitigation Plan*.

<sup>7</sup> Goettel, Kenneth. 2003. *Lane County Risk Assessment*.

<sup>8</sup> State Interagency Hazard Mitigation Team. 2004. *State of Oregon Natural Hazard Mitigation Plan*.

<sup>9</sup> Ibid.

<sup>10</sup> [http://mtjune.uoregon.edu/website/hazardmaps/webapp/hazardsViewer\\_content.html](http://mtjune.uoregon.edu/website/hazardmaps/webapp/hazardsViewer_content.html)

<sup>11</sup> State Interagency Hazard Mitigation Team. 2004. *State of Oregon Natural Hazard Mitigation Plan*.

<sup>12</sup> State Interagency Hazard Mitigation Team. 2004. *State of Oregon Natural Hazard Mitigation Plan*.

<sup>13</sup> [http://mtjune.uoregon.edu/website/hazardmaps/webapp/hazardsViewer\\_content.html](http://mtjune.uoregon.edu/website/hazardmaps/webapp/hazardsViewer_content.html)

<sup>14</sup> State Interagency Hazard Mitigation Team. 2004. *State of Oregon Natural Hazard Mitigation Plan*.

<sup>15</sup> Ibid.

<sup>16</sup> Ibid.

# Section 4

## Lane County Action Plan

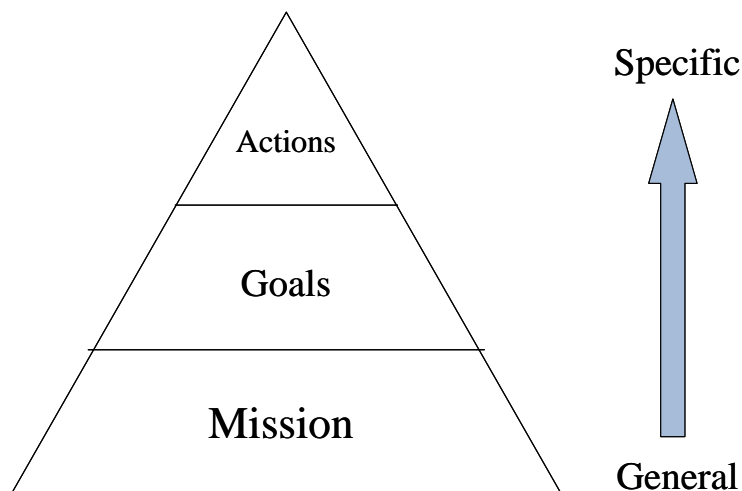
### Action Plan Framework

This section provides information on the process used to develop the action plan framework for the Lane County Natural Hazards Mitigation Plan. The framework consists of three parts—Mission, Goals, and Action Items:

- **Mission**— The mission statement is a philosophical or value statement that answers the question “Why develop a plan?” In short, the mission states the purpose and defines the primary function of the Lane County Natural Hazards Mitigation Plan. The mission is an action-oriented statement of the plan’s reason to exist, and is broad enough that it need not change unless the community environment changes.
- **Goals**— Goals are intended to represent the general ends toward which the Lane County Natural Hazards Mitigation Plan is directed. Goals identify how the County intends to work toward mitigating risk from natural hazards. They do not specify how Lane County is to achieve a given level of performance, but serve as guiding principles for the specific recommendations outlined in the action items.
- **Action Items**— Action items are detailed recommendations for activities that local departments, citizens, and others could engage in to reduce natural hazard risk in Lane County.

Figure 4-1 illustrates the framework of the action plan and depicts the level of specificity for each of the action plan components.

**Figure 4.1: Framework for Mission, Goals, and Action Items**



## Natural Hazards Mitigation Plan Mission

A natural hazard mitigation plan's mission should consider the following three questions: 1) who does the plan serve? 2) what are the intentions of the plan? and 3) what can the plan accomplish? The mission statement for the Lane County Natural Hazards Mitigation Plan is as follows:

*The Lane County Natural Hazards Mitigation Plan serves as an educational and technical resource to assist government agencies, community organizations, businesses, and local communities in researching, coordinating and implementing activities that eliminate or mitigate hazards for the protection of people, property, and the environment.*

## Mitigation Plan Goals

The plan goals help to guide the direction of future activities aimed at reducing risk and preventing losses from natural hazards. The goals listed here serve as the guiding principles for agencies and organizations as they begin implementing action items. Each goal includes a goal statement, which serves to further explain how each of the plan's goals will assist in mitigating the affects of natural hazards within Lane County.

### **GOAL 1: Save lives and reduce injuries.**

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**Goal Statement:** Natural hazards have the potential to cause loss of life and injury to citizens in Lane County. The plan will assist the County in saving lives and reducing injuries by improving the ability of agencies to respond to natural hazards, increasing the disaster resistance of buildings and infrastructure through structural and non-structural mitigation, and promoting awareness of the natural hazards that affect the county.

### **GOAL 2: Minimize and prevent damage to buildings and infrastructure.**

---

**Goal Statement:** Natural hazards have the potential to cause damage to buildings and infrastructure. Structures constructed prior to modern building codes are often at the greatest risk of damage from natural hazards. Pre-planning to prioritize structural and non-structural mitigation can help minimize damage to buildings and infrastructure, saving the time, money, and resources that would be used for repairs and reconstruction after a natural hazard event. Such mitigation efforts can assist the County in recovering more effectively and efficiently after the occurrence of a natural hazard.

### **GOAL 3: Reduce economic loss.**

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**Goal Statement:** Local economies can be severely impacted by disasters when local businesses have to close for extended periods of time due to physical and/or infrastructure damages. The plan will assist the County in reducing economic loss by mitigating the impact of natural hazards on Lane County's economic assets, such as large, medium, and small employers, and the recreation and tourism industry. Such mitigation efforts can assist the County in recovering more effectively and efficiently after the occurrence of a natural hazard.

### **GOAL 4: Decrease disruption of services.**

---

**Goal Statement:** Natural hazards can impair a community's ability to provide essential services by damaging public infrastructure such as roads, utility and water lines, and buildings that house social services. Minimizing the potential for service disruption will allow the County to continue to function after a disaster and may assist the community in recovering more quickly.

### **GOAL 5: Protect natural and cultural resources.**

---

**Goal Statement:** Natural and cultural resources play an important role in defining Lane County and may be irreplaceable if severely impacted by disasters. The plan will assist the County in planning to protect natural and cultural resources, such as historic structures and Native American sites, by using mitigation to minimize minimizing the potential for losses.

### **GOAL 6: Increase awareness and understanding of the hazards and risks in Lane County.**

---

**Goal Statement:** Conducting outreach to educate and inform the public about the natural hazards that affect Lane County helps create an informed citizenry. Keeping the public aware of the effects of natural hazards and the County's efforts to mitigate those effects assists the public in understanding, preparing for, and responding to natural hazard events.

## **Mitigation Plan Action Items**

The plan identifies action items developed through various plan inputs, data collection and research. The action items identified by the plan are intended to move the County toward achieving the plan's goals. The activities identified in the plan may be considered for funding through a number of local, state, and federal programs, including the Federal Emergency Management Agency's Hazard Mitigation Grant Program and Pre-Disaster Mitigation Competitive Grant Program. Action items address both multi-hazard (MH) and hazard-specific issues for the hazards addressed in this plan.

To facilitate implementation, each action item is described in a worksheet, which includes information on key issues addressed, ideas for implementation, coordinating and partner organizations, timeline, and plan goals addressed.

### **Rationale or Key Issues Addressed:**

Each action item includes a list of the key issues or the rationale that supports the proposed activity. Action items should be fact-based and tied directly to issues or needs identified through the planning process. Input for action items can come from a number of sources, including participants in the planning process, noted deficiencies in local capabilities, or issues identified through the risk assessment.

### **Ideas for Implementation:**

Each action item includes ideas for implementation and potential resources. This information offers a transition from theory to practice. The ideas for implementation serve as a starting point for this plan. This component is dynamic in nature, as some ideas may be not feasible, and new ideas may be added during the plan maintenance process. (For more information on how this plan will be implemented and evaluated, refer to Section 5: Plan Implementation and Maintenance).

Action items are suggestions about how to implement plan goals. These include elements such as collaboration with relevant organizations, grant programs, tax incentives, human resources, education and outreach, research, and physical manipulation of buildings and infrastructure. A list of potential resources outlines which organization or agency would be most qualified and capable of performing the implementation strategy.

### **Coordinating Organization:**

The coordinating organization is the organization that is willing and able to organize resources, find appropriate funding, and oversee activity implementation, monitoring, and evaluation.

### **Internal Partners:**

Internal partners are those County departments or divisions that may be able to assist in the implementation of action items by providing relevant resources to the coordinating organization.

### **External Partners:**

External partner organizations can assist the coordinating organization in implementing the action items in various ways. Partners may include local, regional, state, or federal agencies, as well as local and regional public and private entities.

The internal and external partner organizations listed in the plan are potential partners recommended by the project steering committee, but were not necessarily contacted during the development of the plan. The

coordinating organization should contact the identified partner organizations to see if they are capable of and willing to participate. This initial contact also provides an opportunity to gain a commitment of time and/or resources toward completion of the action items.

### **Timeline:**

Action items include either short-term, long-term, or ongoing activities. Each action item contains an estimated timeline for implementation. *Short-term action items* are activities that may be implemented with existing resources and authorities in one to two years. *Long-term action items* may require new or additional resources and/or authorities, and may take from one to five years to implement.

## **Planning Process**

### **Identifying the Plan Mission, Goals, and Action Items:**

In a series of meetings in July and August 2005, the Natural Hazards Mitigation Plan Steering Committee members met to identify the plan's mission, goals, and action items. To accomplish this task, Steering Committee members reviewed the work that had been completed in Phase Two of the County's natural hazards mitigation planning to determine if the work produced still offered a relevant and accurate assessment of the County's situation and levels of risk.

In addition, Steering Committee members examined the action items proposed in Phase Two (the risk assessment phase completed by Goettel & Associates in 2003) to determine if they were feasible and appropriate in assisting the County in meeting the plan's identified goals. The Steering Committee also identified several new actions based on current issues and needs. After identifying the plan's action items, coordinating agencies were assigned to each action. The Oregon Natural Hazards Workgroup worked with each assigned coordinating agency to complete worksheets for each action item.

## **Action Plan Matrix**

The Action Plan matrix portrays the overall action plan framework and identifies links between the plan goals and action. The matrix documents a description of the action, the coordinating organization, timeline, and the plan goals addressed. Each action item has a corresponding action item worksheet describing the activity, identifying the rationale for the project, potential ideas for implementation, and assigning coordinating and partner organizations. These action item worksheets are located at the end of this section following the Action Plan Matrix.

## LANE COUNTY: Natural Hazards Mitigation Action Item Matrix

Action Item #	Action Item	Coordinating Agency	Timeline	Alignment to Plan Goals					
				Save lives and reduce injuries	Minimize and prevent damage to buildings and infrastructure	Reduce economic loss	Decrease disruption to services	Protect natural and cultural resources	Increase awareness and understanding of the hazards and risks in Lane County
<b>Multi-Hazard Mitigation Action Items</b>									
MH #1	Create and formalize a Lane County Advisory Committee to oversee implementation, identify and coordinate funding opportunities, and sustain the Lane County Natural Hazards Mitigation Plan (including the CWPP) and the Emergency Operations Plan, as a single integrated effort.	Emergency Management	ST	✓	✓	✓	✓	✓	✓
MH #2	Create a sub-committee to coordinate and sustain effective countywide public education and outreach activities.	Emergency Management	ST						✓
MH #3	Develop education programs aimed at mitigating the risk posed by hazards.	Emergency Management	Ongoing	✓					✓
MH #4	Encourage the public to have supplies, emergency kits, and emergency plans in place. Information on developing family emergency plans and kits should be disseminated through several different channels - television, radio and mail.	Emergency Management	Ongoing	✓					✓
MH #5	Provide HAZUS training opportunities for County Staff.	Public Works - GIS	Ongoing				✓		✓
MH #6	Digitize the existing maps and data concerning hazardous areas within the county.	Land Management	ST	✓	✓	✓	✓		
MH #7	Expand existing special needs population data to include detailed inventory of all at-risk communities (elderly, homeless, disabled, etc.) that are w/out access to transportation and communication and determine mechanisms for alert/ warning and evacuation.	Lane County Public Health	ST	✓		✓			✓
MH #8	Review and develop recommendations to the Lane County Board of Commissioners for additions to land use regulations such as the creation of new potential hazard overlay zones or environmental constraint overlays (in addition to existing flood and wildland-urban interface overlays) such as tsunami inundation areas, steep slope, or debris flow prone areas.	Land Management	LT		✓		✓		
MH #9	Develop a data repository for all existing GIS hazard data, and a GIS clearinghouse for sharing risk assessment GIS data layers and risk models	Public Works - GIS	Ongoing			✓	✓		

Action Item #	Action Item	Coordinating Agency	Timeline	Alignment to Plan Goals					
				Save lives and reduce injuries	Minimize and prevent damage to buildings and infrastructure	Reduce economic loss	Decrease disruption to services	Protect natural and cultural resources	Increase awareness and understanding of the hazards and risks in Lane County
MH #10	Develop inter-ties between drinking water systems to allow for backup water supply if one source of drinking water is significantly affected by a natural hazard event.	EWEB	LT		✓	✓	✓	✓	
<b>Earthquake Mitigation Action Items - County's Self Risk Assessment Score: 175 out of 240</b>									
EH #1	Educate homeowners about structural and non-structural retrofiting of vulnerable homes and encourage retrofit	Emergency Management	Ongoing	✓	✓				✓
EH #2	Develop an inventory of public and commercial buildings that may be particularly vulnerable to earthquake damage	Emergency Management	ST	✓	✓	✓	✓		
EH #3	Complete Rapid Visual Assessments to analyze seismic vulnerability of public facilities.	Emergency Management	ST	✓	✓	✓	✓		
EH #4	Develop and implement projects for highest priority facilities from Earthquake Hazard #3: Complete Rapid Visual Assessments to analyze seismic vulnerability of public facilities.	Emergency Management	LT	✓	✓	✓			
EH #5	Implement recommendations listed in OEM's After Action Report dated August 2005 pertaining to the West Coast Tsunami Warning that was issued on June 14, 2005	Emergency Management	LT	✓	✓	✓	✓		✓
<b>Flood Mitigation Action Items: Within FEMA-Mapped Floodplains - County's Self Risk Assessment Score: 165 out of 240</b>									
FH #1	Compile data and prepare GIS maps for structures within the 100-year floodplains. Use the newly available Lane County DFIRMs (Digital Flood Insurance Rate Maps) and the nearly complete & updated parcel base to create an online application for planners, property owners and potential land buyers to quickly and easily understand flood hazards.	Public Works - GIS	Ongoing	✓	✓	✓			✓
FH #2	Consult with property owners and explore mitigation actions for the 20 Lane County properties on FEMA's national repetitive loss list	Land Management	ST	✓	✓				✓
FH #3	Conduct study to understand relationship between NWS stream gauge data and on-the ground flood impacts felt by landowners along the forks of the Willamette River.	Emergency Management	ST	✓	✓	✓			✓

Action Item #	Action Item	Coordinating Agency	Timeline	Alignment to Plan Goals					
				Save lives and reduce injuries	Minimize and prevent damage to buildings and infrastructure	Reduce economic loss	Decrease disruption to services	Protect natural and cultural resources	Increase awareness and understanding of the hazards and risks in Lane County
<b>Flood Mitigation Action Items: Outside of FEMA-Mapped Floodplains - County's Self Risk Assessment Score: 165 out of 240</b>									
FH #4	Complete the inventory of locations in Lane County subject to frequent storm water flooding	Public Works	Ongoing	✓	✓		✓		
FH #5	For locations with repetitive flooding and significant damages or road closures, determine and implement mitigation measures such as upsizing culverts or storm water drainage ditches	Public Works - Roads	Ongoing		✓	✓	✓		
FH #6	Explore the potential for Lane County to participate in the Community Rating System (CRS) of the National Flood Insurance Program (NFIP)	Land Management	ST		✓	✓	✓		✓
<b>Landslide Mitigation Action Items - County's Self Risk Assessment Score: 171 out of 240</b>									
LH #1	Work with the Forest Service to educate landowners on ideas for mitigating the affects of landslides, including establishing evacuation routes	Land Management	Ongoing	✓	✓		✓		✓
LH #2	Expand on DOGAMI provided data to develop inventory of locations where buildings or infrastructure are subject to landslides	Public Works - GIS	ST	✓	✓				
LH #3	Consider adoption of a hillside development ordinance with the intent of monitoring and regulating grading, excavation, development and cut and fill activities on steep or unstable slopes. Ordinances of this kind have been used to promote public safety by controlling land disturbing activities in hazardous areas that may contribute to or be impacted by debris flows.	Land Management	ST	✓	✓				
LH #4	Develop a GIS data layer that identifies areas that have become more vulnerable to landslides as a result of a wildfire event.	EWEB	ST	✓	✓				
<b>Wildfire Mitigation Action Items</b>									
See action item matrix in <i>Wild Fire Annex: Lane County CWPP</i> for wildfire mitigation action items									

Action Item #	Action Item	Coordinating Agency	Timeline	Alignment to Plan Goals					
				Save lives and reduce injuries	Minimize and prevent damage to buildings and infrastructure	Reduce economic loss	Decrease disruption to services	Protect natural and cultural resources	Increase awareness and understanding of the hazards and risks in Lane County
<b>Winter Storm Mitigation Action Items - County's Self Risk Assessment Score: Unavailable</b>									
WH #1	Work with utilities to establish agreed upon standards for all utilities operating in Lane County regarding tree pruning around transmission lines and trunk distribution lines.	Emergency Management	Ongoing				✓		
WH #2	Provide information brochures to property owners to encourage tree pruning near service drops	Blachly - Lane Electric Co-Op	Ongoing		✓		✓		✓
WH #3	Determine undergrounding requirements for utility extension; assess and evaluate for any needed improvements in the requirements.	Land Management	Ongoing			✓	✓		
WH #4	Conduct outreach campaign to remind government, private sector and non-government agencies to keep sidewalks free of ice during severe winter storms.	Public Works - Roads	Ongoing	✓		✓			✓
WH #5	Conduct public outreach campaigns in early fall each year to remind people how to get around unfavorable adverse weather conditions (i.e., driving on icy roads, etc.)	Public Works	Ongoing	✓		✓			✓
WH #6	Identify which critical facilities in Lane County need backup power and emergency operations plans to deal with power outages.	Emergency Management	ST			✓	✓		
WH #7	Develop public/private partnership (i.e., public works and arborist society) to educate property owners how to evaluate the health of trees on their property.	Public Works - Roads	ST					✓	✓
WH #8	Develop a hazardous tree inventory for all County properties.	Public Works - Parks	ST			✓	✓	✓	✓
WH #9	Consider upgrading lines and poles to improve wind/ice loading, undergrounding critical lines, and adding interconnect switches to allow alternative feed paths and disconnect switches to minimize outage areas	Blachly - Lane Electric Co-Op	LT			✓	✓		
<b>Volcanic Hazards Mitigation Action Items - County's Self Risk Assessment Score: Unavailable</b>									
VH #1	Update public emergency notification procedures for ash fall events	Emergency Management	ST						✓

Action Item #	Action Item	Coordinating Agency	Timeline	Alignment to Plan Goals					
				Save lives and reduce injuries	Minimize and prevent damage to buildings and infrastructure	Reduce economic loss	Decrease disruption to services	Protect natural and cultural resources	Increase awareness and understanding of the hazards and risks in Lane County
VH #2	Update emergency response planning for ash fall events	Emergency Management	ST	✓			✓		
VH #3	Evaluate capability of water treatment plants to deal with high turbidity from ash falls and upgrade treatment facilities and emergency response plans to deal with ash falls	EWEB SUB	ST		✓		✓		
VH #4	Use the high resolution maps developed by U.S. Geological Survey (that model the scenarios likely mud flow, avalanche debris and lahar paths in the event of an eruption from the South Sister) to assist in updating the emergency response plan, including public notification and evacuation routes.	EWEB - Source Protection Program	ST	✓	✓	✓			
<b>Dam Safety Mitigation Action Items</b>									
DH #1	Train first responders on alert/warning systems, emergency plan and evacuation routes	EWEB	Ongoing	✓			✓		✓
DH #2	Encourage the Corps of Engineers to complete seismic vulnerability assessments for dams upstream of heavily populated areas in Lane County and to make seismic improvements as necessary	COE	Ongoing	✓	✓		✓		
DH #3	Prepare high resolution maps of dam failure inundation areas and update emergency response plan including public notification and evacuation routes	EWEB COE	ST	✓		✓	✓		
<b>Utility and Transportation System Disruption Mitigation Action Items</b>									
<b>Hazmat Incident Mitigation Action Items</b>									
HMH #1	Enhance emergency planning, emergency response training and equipment to address hazardous materials incidents.	Regional HazMat Team	Ongoing	✓		✓			
HMH #2	Ensure that first responders have readily available site-specific knowledge of hazardous chemical inventories in Lane County	OSFM	ST	✓			✓		✓
HMH #3	Plot HazMat locations in GIS for first responders.	Public Works - GIS	ST	✓			✓		✓

Action Item #	Action Item	Coordinating Agency	Timeline	Alignment to Plan Goals					
				Save lives and reduce injuries	Minimize and prevent damage to buildings and infrastructure	Reduce economic loss	Decrease disruption to services	Protect natural and cultural resources	Increase awareness and understanding of the hazards and risks in Lane County
<b>Terrorism Mitigation Action Items</b>									
TH #1	Enhance emergency planning, emergency response training and equipment to address potential terrorism incidents.	Emergency Management	Ongoing	✓	✓	✓			
TH #2	Upgrade physical security detection and response capability for critical facilities, including water systems	EWEB	LT		✓	✓	✓		

# Action Item Proposal Form

<b>Proposed Action Item Identification:</b>	
Short Term: Multi-Hazard #1	
<b>Proposed Action Title/Description:</b>	
Create and formalize a Lane County Disaster Policy Council to oversee implementation, identify and coordinate funding opportunities, and sustain the Lane County Natural Hazards Mitigation Plan (including the CWPP) and the Emergency Operations Plan, as a single integrated effort.	
<b>Rationale for Proposed Action Item:</b>	
<ul style="list-style-type: none"> <li>• <b>CWPP Stakeholder interviews, Firewise Workshop</b>-Identified an opportunity for a central committee to provide leadership by prioritizing and setting guidelines for fuels reduction projects. The support for a CWPP Advisory Committee can be used to infer support for an advisory committee that provides leadership and guidance for all natural hazards affecting Lane County.</li> <li>• Following the events of 9-11, Lane County agencies wanted a group in place to mitigate against all types of hazards. The County-Wide Preparedness Group was formed to satisfy this request. That group can serve as a resource to the Lane County Disaster Policy Council.</li> </ul>	
<b>Ideas for Implementation:</b>	
<ul style="list-style-type: none"> <li>• Expand current Lane County NHMP steering committee to include a variety of stakeholders, so that input can be provided for all natural hazards and other disasters affecting Lane County.</li> <li>• Convene the Disaster Policy Council and sign a MOU for each calendar year depicting agency commitments and seek ways to reimburse for staff time as an incentive for participation.</li> <li>• Hold quarterly meetings to review the plan and identify highest priority projects most feasible for implementation.</li> <li>• Coordinate timelines to take advantage of funding opportunities available through Resource Advisory Committees that award Title II project funds, and State Homeland Security grants.</li> <li>• The Committee has the ability to add sub-committees as needed.</li> </ul>	
<b>Coordinating Organization:</b>	<b>Lane County Emergency Management, Lane County Land Management</b>
<b>Internal Partners:</b>	<b>External Partners:</b>
Law Enforcement, LCPW, LCPH	The 16 member agencies of the County-Wide Preparedness Group
<b>Timeline:</b>	<b>If available, estimated cost:</b>
<u>Short Term</u> (0-2 years)	<u>Long Term</u> (2-4 or more years)
6-7 Months	

# Action Item Proposal Form

<b>Proposed Action Item Identification:</b>		
Short Term: Multi-Hazards #2		
<b>Proposed Action Title:</b>		
Create a sub-committee to coordinate and sustain effective countywide public education and outreach activities.		
<b>Rationale for Proposed Action Item:</b>		
<ul style="list-style-type: none"> <li>• <b>Stakeholder Phone Interviews, Firewise Workshop</b> - Identified an opportunity to increase education and wildland-urban interface fire awareness of residents of Lane County to increase public involvement in wildfire risk reduction activities. Support for public education of wildland-urban interface fire hazards can be used to infer support for public education and involvement of other hazards addressed by the Lane County NHMP.</li> <li>• The Disaster Mitigation Act of 2000 requires that communities continue to involve the public beyond the original planning process [201.6(c)(4)(ii)]. Creating a sub-committee to conduct public outreach and education would be a way to keep the public informed of, and involved in, the County's actions to mitigate hazards.</li> </ul>		
<b>Ideas for Implementation:</b>		
<ul style="list-style-type: none"> <li>• Coordinate with the Lane County Fire Prevention Co-op, the coordinating agency for the Lane County CWPP's public education sub-committee.</li> <li>• Encourage the support of rural fire districts for outreach and education activities, as 27% of Lane County CWPP Landowner Survey respondents indicated that they have never received information about protecting their property from wildland fire. This information can be used to infer that landowners have likewise received limited information regarding other natural hazards affecting Lane County.</li> <li>• Create and deliver an annual standardized direct mailing to landowners, as 59% of the Lane County CWPP Landowner Survey respondents identified mail as the method they would most prefer used to disseminate information in the future. Support for mail as a future communication method for information regarding wildland-urban interface fire can be used to infer support for mail as a method to communicate information to the public regarding other natural hazards affecting Lane County.</li> <li>• Coordinate countywide funding opportunities for education and outreach activities.</li> </ul>		
<b>Coordinating Organization:</b>	Lane County Emergency Management	
<b>Internal Partners:</b>		<b>External Partners:</b>
ODF, Public Information Officers		Lane County Fire Prevention Co-Op, USFS, BLM, Keep Oregon Green, Lane County RFD's Eugene/Springfield/Cottage Grove FD's
<b>Timeline:</b>		<b>If available, estimated cost:</b>
<u>Short Term</u> (0-2 years)	<u>Long Term</u> (2-4 or more years)	<i>Depends on future activities</i>
3-6 months		

# Action Item Proposal Form

<b>Proposed Action Item Identification:</b>	
Ongoing: Multi-Hazards #3	
<b>Proposed Action Title/Description:</b>	
Develop education programs aimed at mitigating the risk posed by hazards.	
<b>Rationale for Proposed Action Item:</b>	
<ul style="list-style-type: none"> <li>• In a self hazard analysis, Lane County rated itself as having an above average risk to the majority of hazards addressed by the NHMP. Improved outreach to educate Lane County residents on hazard risk mitigation efforts can help reduce the county's overall risk to natural hazards.</li> <li>• To increase natural hazard mitigation and emergency preparedness in Lane County, residents must be aware of the risk and know what they should do before and after the disaster occurs. Outreach and awareness campaigns need to be carefully organized and developed to ensure that residents receive critical information.</li> <li>• The <i>State of Oregon's Natural Hazard Mitigation Plan</i> indicates Lane County's probability for, and vulnerability to, most hazards addressed by the NHMP as being moderate or high. Improved outreach to educate Lane County residents on hazard risk mitigation efforts can help reduce the county's overall risk to natural hazards.</li> <li>• The Disaster Mitigation Act of 2000 requires that communities continue to involve the public beyond the original planning process [201.6(c)(4)(ii)]. Developing public education programs for hazard risk mitigation would be a way to keep the public informed of, and involved in, the County's actions to mitigate hazards.</li> </ul>	
<b>Ideas for Implementation:</b>	
<ul style="list-style-type: none"> <li>• Utilize agency public information officers to disseminate educational resources.</li> <li>• Collaborate with other agencies to develop targeted outreach program focused on risk reduction for:             <ul style="list-style-type: none"> <li>• Citizens</li> <li>• Businesses</li> <li>• Organizations</li> </ul> </li> <li>• Develop and disseminate information to populations located in identified at-risk areas.</li> <li>• Integrate natural hazard information into publications/pamphlets distributed in the media about general safety procedures (72 hour kits, emergency evacuation routes, etc.).</li> <li>• Develop announcement protocols for all county sponsored events to address emergency evacuations and preparedness during a situation.</li> <li>• Use sub-committee formed in action item <i>Multi-Hazards #6</i>.</li> </ul>	
<b>Coordinating Organization:</b>	<b>Lane County Emergency Management</b>
<b>Internal Partners:</b>	<b>External Partners:</b>
Law Enforcement, LCPW, LCPH, Public Information Officers	Radio Stations, Television Stations, Newspapers, Fire Service Agencies, Red Cross, Private Businesses (i.e. insurance carriers)
<b>Timeline:</b>	<b>If available, estimated cost:</b>
Short Term (0-2 years)	
Long Term (2-4 or more years)	
	Ongoing

# Action Item Proposal Form

<b>Proposed Action Item Identification:</b>		
Ongoing: Multi-Hazards #4		
<b>Proposed Action Title/Description:</b>		
Encourage the public to have supplies, emergency kits, and emergency plans in place. Information on developing family emergency plans and kits should be disseminated through several channels - television, radio and mail.		
<b>Rationale for Proposed Action Item:</b>		
<ul style="list-style-type: none"> <li>• In a self hazard analysis, Lane County rated itself as having an above average risk to the majority of hazards addressed by the NHMP. Conducting outreach to educate the public on the importance of having emergency kits, supplies, and plans better prepares citizens for natural hazard events, helping reduce the county's overall risk to natural hazards.</li> <li>• To increase natural hazard mitigation and emergency preparedness in Lane County, residents must be aware of the risk and know what they should do before and after the disaster occurs. Outreach and awareness campaigns need to be carefully organized and developed to ensure that residents receive critical information.</li> <li>• The <i>State of Oregon's Natural Hazard Mitigation Plan</i> indicates Lane County's probability for, and vulnerability to, most hazards addressed by the NHMP as being moderate or high. Conducting outreach to educate the public on the importance of having emergency kits, supplies, and plans better prepares citizens for natural hazard events, helping reduce the county's overall risk to natural hazards.</li> <li>• The Disaster Mitigation Act of 2000 requires that communities continue to involve the public beyond the original planning process [201.6(c)(4)(ii)]. Conducting outreach to educate the public on the importance of emergency kits, supplies, and plans would be a way to keep the public informed of, and involved in, the County's actions to mitigate hazards.</li> </ul>		
<b>Ideas for Implementation:</b>		
<ul style="list-style-type: none"> <li>• <b>CWPP Land Owner Survey</b> – Survey respondents had the ability to rank their preferred methods of receiving future communication. 59% of survey respondents indicated that mail was their most preferred method of future communication; 49% preferred newspapers; 42% preferred television; and 42% preferred fact sheets and brochures. The support for these methods of communication to receive information about wildfire can be used to infer support for using these methods to communication information about all natural hazards affecting Lane County.</li> <li>• Use methods supported by the CWPP landowner survey to develop dissemination methods to educate the public on how to create emergency kits and plans:             <ul style="list-style-type: none"> <li>• Mailings</li> <li>• Television public service announcements</li> <li>• Newspaper inserts/spots</li> </ul> </li> </ul>		
<b>Coordinating Organization:</b>	<b>Lane County Emergency Management</b>	
<b>Internal Partners:</b>		<b>External Partners:</b>
Public Information Officers		Local television stations and newspapers
<b>Timeline:</b>		<b>If available, estimated cost:</b>
<u>Short Term</u> (0-2 years)	<u>Long Term</u> (2-4 or more years)	
	Ongoing	

# Action Item Proposal Form

<b>Proposed Action Item Identification:</b>		
Ongoing: Multi-Hazards #5		
<b>Proposed Action Title/Description:</b>		
Provide HAZUS training opportunities for County Staff.		
<b>Rationale for Proposed Action Item:</b>		
<ul style="list-style-type: none"> <li>• HAZUS is a GIS mapping tool that can be used to estimate loss for potential natural hazard events. There are three HAZUS models:             <ul style="list-style-type: none"> <li>• Hurricane Wind Model</li> <li>• Earthquake Model</li> <li>• Flooding Model</li> </ul> </li> <li>• HAZUS can assist communities determine losses, therefore allowing for emergency preparedness, response and recovery planning, and future risk reduction decisions.</li> <li>• If Lane County GIS technicians are trained in HAZUS then they will be able to create maps that will assist decision makers to make informed decisions about natural hazard risk reduction procedures and activities in Lane County.</li> <li>• In a self hazard analysis, Lane County rated itself as having an above average flood risk rating of 165 out of 240. Improved estimates of losses from potential flooding events can help the County to better identify ways to reduce its risk to flooding.</li> <li>• The <i>State of Oregon's Natural Hazard Mitigation Plan</i> indicates that Lane County's probability for a future flood event is high (that the county would be likely to have a major flooding event in the next 10-35 years) and that the county's vulnerability to a future flood event is moderate. Improved estimates of losses from potential flooding events can help the County to better identify ways to reduce its risk to flooding.</li> </ul>		
<b>Ideas for Implementation:</b>		
<ul style="list-style-type: none"> <li>• Allow GIS technicians to attend FEMA HAZUS trainings, and ensure that this is a continued effort. HAZUS training is available free to jurisdictions at the Emergency Management Institute.</li> <li>• Have annual HAZUS informational trainings for Lane County Emergency Management, Lane County Land Management Division, and Lane County Public Works GIS personnel.</li> <li>• Investigate data requirements for HAZUS models and locate data sources.</li> <li>• Contact FEMA Region X for possible training opportunities.</li> <li>• Develop a partnership with ORHUG for possible HAZUS collaboration and training.</li> </ul>		
<b>Coordinating Organization:</b>	Lane County Public Works – GIS	
<b>Internal Partners:</b>		<b>External Partners:</b>
LCEM, LCLMD		FEMA, LCOG, ORHUG
<b>Timeline:</b>		<b>If available, estimated cost:</b>
<u>Short Term</u> (0-2 years)	<u>Long Term</u> (2-4 or more years)	Approximately \$2,000 - \$5,000
	Ongoing	

# Action Item Proposal Form

<b>Proposed Action Item Identification:</b>	
Short Term: Multi-Hazards #6	
<b>Proposed Action Title/Description:</b>	
Digitize the existing maps and data concerning hazardous areas within the county.	
<b>Rationale for Proposed Action Item:</b>	
<ul style="list-style-type: none"> <li>• In a self hazard analysis, Lane County rated itself as having an above average risk to the majority of hazards addressed by the NHMP. Improved data for risk assessments can help the County to better identify ways to reduce its risk to natural hazards.</li> <li>• The <i>State of Oregon's Natural Hazard Mitigation Plan</i> indicates Lane County's probability for, and vulnerability to, most hazards addressed by the NHMP as being moderate or high. Improved data for risk assessments can help the County to better identify ways to reduce its risk to natural hazards.</li> <li>• The Disaster Mitigation Act of 2000 recommends that communities identify the types and numbers of buildings, infrastructure, and critical facilities in hazard areas [201.6(c)(2)(i)]. The County currently does not have the appropriate dataset to complete this step of the risk assessment process. Better risk assessments can assist communities better direct limited mitigation dollars.</li> </ul>	
<b>Ideas for Implementation:</b>	
<ul style="list-style-type: none"> <li>• Create and maintain a single server/location that regional users can access for accurate GIS data. This is especially important for LMD when issuing building permits or analyzing development proposals.</li> <li>• Digitize all maps used to develop the Coastal Resource Management Plan. These maps show areas of geologic instability; active, stable and instable dunes; geologic hazards, and more.</li> <li>• Digitize water quality and quantity maps. These maps show areas where water quality is impaired or quantity is limited. Specific pollutants are identified.</li> <li>• Digitize the wetlands maps.</li> <li>• Use HAZUS to analyze the data after it is digitized.</li> <li>• Incorporate CWPP assessment data.</li> <li>• Take into account the seismic vulnerability inventory from action item <i>Earthquake Hazard #3</i>.</li> </ul>	
<b>Coordinating Organization:</b>	<b>Lane County Land Management Division</b>
<b>Internal Partners:</b>	<b>External Partners:</b>
LCPW-GIS	DOGAMI
<b>Timeline:</b>	<b>If available, estimated cost:</b>
<u>Short Term</u> (0-2 years)	<u>Long Term</u> (2-4 or more years)
1 Years	

# Action Item Proposal Form

<b>Proposed Action Item Identification:</b>	
Short Term: Multi-Hazards #7	
<b>Proposed Action Title/Description:</b>	
Expand existing special needs population data to include detailed inventory of all at-risk communities (elderly, homeless, disabled, etc.) that are w/out access to transportation and communication and determine mechanisms for alert/ warning and evacuation.	
<b>Rationale for Proposed Action Item:</b> <i>(What critical issues will the action address?)</i>	
<ul style="list-style-type: none"> <li>• Creating an inventory of special needs populations that are without access to transportation and communication will assist emergency personnel in responding to such populations in the event of a natural hazard.</li> <li>• The Disaster Mitigation Act of 2000 requires that communities identify their vulnerability to the hazards that affect the community, and how the community will be impacted by the [201.6(c)(2)(ii)(A)]. Creating an inventory of special needs populations will help the county identify the way in which these populations will be impacted in the event of a natural hazard, assisting the identification of the county's overall vulnerability to natural hazards.</li> </ul>	
<b>Ideas for Implementation: (Optional)</b>	
<ul style="list-style-type: none"> <li>• Cross-reference any information obtained for this action item with similar information in Lane County's Emergency Operations Plan (EOP); incorporate any new or more accurate data into the EOP.</li> </ul>	
<b>Coordinating Organization:</b>	Lane County Public Health
<b>Internal Partners:</b>	<b>External Partners:</b>
LCEM	Red Cross
<b>Timeline:</b>	<b>If available, estimated cost:</b>
<u>Short Term</u> (0-2 years)	<u>Long Term</u> (2-4 or more years)
6 Months	
<b>Form Submitted by:</b>	

# Action Item Proposal Form

<b>Proposed Action Item Identification:</b>	
Long Term: Multi-Hazards #8	
<b>Proposed Action Title/Description:</b>	
Review and develop recommendations to the Lane County Board of Commissioners for additions to land use regulations such as the creation of new potential hazard overlay zones or environmental constraint overlays (in addition to the existing flood and wildland-urban interface overlays) such as tsunami inundation areas, steep slope, or debris flow prone areas.	
<b>Rationale for Proposed Action Item:</b>	
<ul style="list-style-type: none"> <li>• In a self-completed hazard analysis, Lane County rated itself as having an above average risk to the majority of hazards addressed by the NHMP.</li> <li>• Overlay zones are an effective way to assess development in hazard prone areas. They have been used successfully in Lane County to protect people and property from flooding and coastal hazards.</li> <li>• The <i>State of Oregon's Natural Hazard Mitigation Plan</i> indicates Lane County's probability for, and vulnerability to, most hazards addressed by the NHMP as being moderate or high. Improved data for risk assessments can help the County to better identify ways to reduce its risk to natural hazards.</li> <li>• The Disaster Mitigation Act of 2000 requires communities to identify actions and projects that reduce the effects of hazards on both new and existing buildings [201.6(c)(3)(ii)]. The creation of these overlay zones may help identify potential land development changes that will impact both new and existing development. The overlays may also help to refine the County's risk assessment as well.</li> </ul>	
<b>Ideas for Implementation:</b>	
<ul style="list-style-type: none"> <li>• Review similar ordinances within the Northwest for sample code language.</li> <li>• Use GIS data to establish boundaries of potential hazard overlays.</li> <li>• Draft code amendment to create appropriate overlays zones.</li> <li>• Conduct at least 2 public hearings (1 with planning Commission, 1 with County Commissioners).</li> <li>• Conduct at least 1 public meeting (preferably 6) to obtain comments from public.</li> </ul>	
<b>Coordinating Organization:</b>	<b>Lane County Land Management Division</b>
<b>Internal Partners:</b>	<b>External Partners:</b>
LCPW – GIS	Department of Geology and Mineral Resources
<b>Timeline:</b>	<b>If available, estimated cost:</b>
<u>Short Term</u> (0-2 years)	<u>Long Term</u> (2-4 or more years)
	3 Years

# Action Item Proposal Form

<b>Proposed Action Item Identification:</b>	
Ongoing: Multi-Hazards #9	
<b>Proposed Action Title/Description:</b>	
Develop a data repository for all existing GIS hazard data, and a GIS clearinghouse for sharing risk assessment GIS data layers and risk models.	
<b>Rationale for Proposed Action Item:</b>	
<ul style="list-style-type: none"> <li>• In a self-completed hazard analysis, Lane County rated itself as having an above average risk to the majority of hazards addressed by the NHMP. A data repository and clearinghouse of all existing GIS hazard and risk assessment data would allow the agencies involved in hazard mitigation to more easily access all available hazard data from one location. Easier access to the most current existing data improves the ability of those agencies to work toward mitigating hazards, reducing the county's overall risk to hazards.</li> <li>• The <i>State of Oregon's Natural Hazard Mitigation Plan</i> indicates Lane County's probability for, and vulnerability to, most hazards addressed by the NHMP as being moderate or high. A GIS data repository and clearinghouse would allow agencies responsible for hazard mitigation to access the most current information, improving their ability to mitigate for hazards. This will assist the county in reducing its overall risk to hazards.</li> <li>• The Disaster Mitigation Act of 2000 requires communities to identify mitigation actions that are being considered by the community to reduce the effect that natural hazards will have on the community [201.6(c)(3)(ii)]. A GIS data repository and clearinghouse would allow agencies responsible for hazard mitigation to access the most current information, improving their ability to mitigate for hazards. This will assist the county in reducing its overall risk to hazards.</li> </ul>	
<b>Ideas for Implementation:</b>	
<ul style="list-style-type: none"> <li>• Conduct an inventory of County departments and agencies to determine who has GIS hazard data.</li> <li>• Explore ways to acquire existing GIS data.</li> <li>• Develop method for storing GIS hazard data.</li> <li>• Develop basic meta data regarding ownership of data, data sources, update information, projection and scale.</li> <li>• Place GIS data layers in organized file structure on a regional server accessible to all partner agencies.</li> <li>• Develop methods for Lane County Public Works – GIS to be notified when new GIS hazard data is created, and for Public Works – GIS to be able to acquire the newly developed GIS hazard data to keep repository updated.</li> <li>• Develop methods for informing agencies that would need GIS hazard data that the repository exists.</li> </ul>	
<b>Coordinating Organization:</b>	Lane County Public Works – GIS
<b>Internal Partners:</b>	<b>External Partners:</b>
	EWEB; SUB; Eugene GIS; Springfield GIS; LCOG; ODOT
<b>Timeline:</b>	<b>If available, estimated cost:</b>
Short Term (0-2 years)	
Long Term (2-4 or more years)	
	Ongoing

# Action Item Proposal Form

<b>Proposed Action Item Identification:</b>		
Long Term: Multi-Hazard #10		
<b>Proposed Action Title/Description:</b>		
Develop inter-ties between drinking water systems to allow for backup water supply if one source of drinking water is significantly affected by a natural hazard event.		
<b>Rationale for Proposed Action Item:</b>		
<ul style="list-style-type: none"> <li>• Eugene Water &amp; Electric Board, Springfield Utility Board, and Rainbow Water provide drinking water to over 90% of the population in Lane County including Eugene, Springfield, and surrounding communities. The sources of drinking water include the McKenzie River, Middle Fork Willamette River, and a number of wellfields. Developing inter-ties between these drinking water systems improves the County's ability to continue to provide drinking water (at a reduced rate) if one or more of these sources are significantly impacted during a natural hazard event. Such actions help to mitigate the County's overall risk to the natural hazards addressed by the NHMP.</li> <li>• In a self-completed hazard analysis, Lane County rated itself as having an above average risk to the majority of hazards addressed by the NHMP. There are a number of natural hazards that have the potential to cause disruptions in the County's drinking water systems, including floods, volcanic eruptions, and earthquakes. Developing inter-ties between these drinking water systems improves the County's ability to continue to provide drinking water (at a reduced rate) if one or more of these sources are significantly impacted during a natural hazard event. Such actions help to mitigate the County's overall risk to the natural hazards addressed by the NHMP.</li> <li>• The <i>State of Oregon's Natural Hazard Mitigation Plan</i> indicates Lane County's probability for, and vulnerability to, most hazards addressed by the NHMP as being moderate or high. Developing inter-ties between these drinking water systems improves the County's ability to continue to provide drinking water (at a reduced rate) if one or more of these sources are significantly impacted during a natural hazard event. Such actions help to mitigate the County's overall risk to the natural hazards addressed by the NHMP.</li> </ul>		
<b>Ideas for Implementation: (Optional)</b>		
<ul style="list-style-type: none"> <li>• Identify areas where the water systems come in close proximity to one another and engineer inter-tie system that connects the systems at multiple junctions. A feasibility study has been completed that evaluates a number of different alternatives.</li> <li>• Develop appropriate agreements, such as MOUs, for testing and maintenance of these inter-ties between the various water providers.</li> <li>• Construct and test inter-tie system to maintain system pressure and water quality integrity.</li> <li>• During inter-tie construction, check for seismic vulnerability of the water system.</li> </ul>		
<b>Coordinating Organization:</b>	<b>Eugene Water and Electric Board – Water Division</b>	
<b>Internal Partners:</b>		<b>External Partners:</b>
LCEM, LCPW		SUB, Rainbow Water
<b>Timeline:</b>		<b>If available, estimated cost:</b>
<u>Short Term</u> (0-2 years)	<u>Long Term</u> (2-4 or more years)	\$250,000 - \$1,000,000
	3 Years	
<b>Form Submitted by:</b>	<b>Karl Morgenstern, EWEB</b>	

# Action Item Proposal Form

<b>Proposed Action Item Identification:</b>		
Ongoing: Earthquake Hazard #1		
<b>Proposed Action Title/Description:</b>		
Educate homeowners about structural and non-structural retrofitting of vulnerable homes and encourage retrofit.		
<b>Rationale for Proposed Action Item:</b>		
<ul style="list-style-type: none"> <li>• In a self hazard analysis, Lane County rated itself as having an above average earthquake risk rating of 175 out of 240. Increasing public outreach to educate residents about retrofitting homes and structures can help mitigate the county's vulnerability to future earthquakes.</li> <li>• The <i>State of Oregon's Natural Hazard Mitigation Plan</i> indicates Lane County's probability for a future earthquake event is low (that the county would be likely to have a major earthquake event in the next 75-100 years) but that the county's vulnerability to a future earthquake event is high. Increasing public outreach to educate residents about retrofitting homes and structures can help mitigate the county's vulnerability to future earthquakes.</li> <li>• The Disaster Mitigation Act of 2000 requires communities to identify how the community will continue to involve the public in the plan maintenance process [201.6(c)(4)(iii)]. Educating the public helps keep the public informed of what is being done with the plan, how the County is working to mitigate its risk to hazards, and allows for feedback and suggestions from the public for improving, updating, and maintaining the plan.</li> </ul>		
<b>Ideas for Implementation:</b>		
<ul style="list-style-type: none"> <li>• <b>CWPP Land Owner Survey</b> – Survey respondents had the ability to rank their preferred methods of receiving future communication. 59% of survey respondents indicated that mail was their most preferred method of future communication; 49% preferred newspapers; 42% preferred television; and 42% preferred fact sheets and brochures. The support for these methods of communication to receive information about wildfire can be used to infer support for using these methods to communication information about all natural hazards affecting Lane County.</li> <li>• Use methods supported by the CWPP landowner survey to develop dissemination methods for structural and non-structural earthquake retrofitting to homeowners:             <ul style="list-style-type: none"> <li>• Mailings</li> <li>• Television public service announcements</li> <li>• Newspaper inserts/spots</li> </ul> </li> <li>• Distribute Institute for Business and Home Safety Homeowner Retrofit Guides</li> </ul>		
<b>Coordinating Organization:</b>	<b>Lane County Emergency Management</b>	
<b>Internal Partners:</b>		<b>External Partners:</b>
LCLMD, LCPW		FEMA, Red Cross, Television Stations, Newspapers
<b>Timeline:</b>		<b>If available, estimated cost:</b>
<u>Short Term</u> (0-2 years)	<u>Long Term</u> (2-4 or more years)	Approximately \$15,000
	Ongoing	

# Action Item Proposal Form

<b>Proposed Action Item Identification:</b>	
Short Term: Earthquake Hazard #2	
<b>Proposed Action Title/Description:</b>	
Develop inventory of public and commercial buildings that may be particularly vulnerable to earthquake damage.	
<b>Rationale for Proposed Action Item:</b>	
<ul style="list-style-type: none"> <li>• In a self hazard analysis, Lane County rated itself as having an above average earthquake risk rating of 175 out of 240. Completing an inventory of public and commercial buildings that are vulnerable to earthquakes helps the county assess its overall vulnerability to earthquakes. A more accurate assessment of its earthquake vulnerability can assist the county in identifying and selecting appropriate methods for earthquake risk mitigation.</li> <li>• The <i>State of Oregon's Natural Hazard Mitigation Plan</i> indicates Lane County's probability for a future earthquake event is low (that the county would be likely to have a major earthquake event in the next 75-100 years) but that the county's vulnerability to a future earthquake event is high. Completing an inventory of public and commercial buildings that are vulnerable to earthquakes helps the county assess its overall vulnerability to earthquakes. A more accurate assessment of its earthquake vulnerability can assist the county in identifying and selecting appropriate methods for earthquake risk mitigation.</li> <li>• The Disaster Mitigation Act of 2000 requires communities to identify the community's vulnerability to natural hazards, and recommends identifying the types and numbers of buildings and infrastructure that could be affected by hazards [201.6(c)(2)(ii)(A)]. Completing an inventory of public and commercial buildings that are vulnerable to earthquakes helps the county assess its overall vulnerability to earthquakes. A more accurate assessment of its earthquake vulnerability can assist the county in identifying and selecting appropriate methods for earthquake risk mitigation.</li> </ul>	
<b>Ideas for Implementation:</b>	
<ul style="list-style-type: none"> <li>• Determine if a list of vulnerable public and commercial buildings already exists.</li> <li>• Determine the completeness of the existing list.</li> <li>• Identify public and commercial buildings not listed that need to be assessed for earthquake vulnerability.</li> <li>• Work with building owners/operators to evaluate buildings' vulnerability to earthquakes.</li> <li>• Cross-reference any information obtained for this action item with similar information in Lane County's Emergency Operations Plan (EOP) response plan; incorporate any new or more accurate data into the EOP.</li> </ul>	
<b>Coordinating Organization:</b>	<b>Lane County Emergency Management</b>
<b>Internal Partners:</b>	<b>External Partners:</b>
LCPW, LCLMD	DOGAMI
<b>Timeline:</b>	<b>If available, estimated cost:</b>
<u>Short Term</u> (0-2 years)	<u>Long Term</u> (2-4 or more years)
1-2 years	

# Action Item Proposal Form

<b>Proposed Action Item Identification:</b>		
Short Term: Earthquake Hazard #3		
<b>Proposed Action Title/Description:</b>		
Complete <i>Rapid Visual Assessments</i> to analyze seismic vulnerability of public facilities.		
<b>Rationale for Proposed Action Item:</b>		
<ul style="list-style-type: none"> <li>• In a self hazard analysis, Lane County rated itself as having an above average earthquake risk rating of 175 out of 240. Identifying important public facilities with seismic vulnerabilities can assist the county and local communities in planning for ways to mitigate their risks to earthquakes.</li> <li>• Annex 10, <i>Earthquakes</i>, risk assessment scenarios for earthquakes estimated between \$1.6 and \$1.7 billion in damages to buildings. Improving inventories of critical facilities vulnerable to earthquakes for potential seismic retrofitting can help reduce economic losses.</li> <li>• The <i>State of Oregon's Natural Hazard Mitigation Plan</i> indicates Lane County's probability for a future earthquake event is low (that the county would be likely to have a major earthquake event in the next 75-100 years) but that the county's vulnerability to a future earthquake event is high. Identifying important public facilities with seismic vulnerabilities can assist the county and local communities in planning for ways to mitigate their risks to earthquakes.</li> <li>• The Disaster Mitigation Act of 2000 requires communities to identify the community's vulnerability to natural hazards, and recommends identifying the types and numbers of buildings and infrastructure that could be affected by hazards [201.6(c)(2)(ii)(A)]. Analyzing the seismic vulnerability of important public facilities can help the county identify its vulnerability to earthquakes.</li> </ul>		
<b>Ideas for Implementation:</b>		
<ul style="list-style-type: none"> <li>• Create list of important public facilities.</li> <li>• Complete <i>Rapid Visual Assessments</i> to determine vulnerability.</li> <li>• Determine which facilities have had their seismic vulnerability analyzed. For the facilities that have been assessed, find out when assessment was done to determine if a new assessment should be completed to address new seismic standards.</li> <li>• For facilities that have had no seismic vulnerability analysis completed, work with facility operators to perform analysis.</li> <li>• Prioritize facilities based on vulnerability.</li> <li>• Encourage County staff to attend state-sponsored <i>Rapid Visual Assessment</i> trainings.</li> </ul>		
<b>Coordinating Organization:</b>	<b>Lane County Emergency Management</b>	
<b>Internal Partners:</b>		<b>External Partners:</b>
LC Advisory Committee Members, LCLMD		OEM, DOGAMI, FEMA
<b>Timeline:</b>		<b>If available, estimated cost:</b>
<u>Short Term</u> (0-2 years)	<u>Long Term</u> (2-4 or more years)	\$50,000
1-2 Years		

# Action Item Proposal Form

<b>Proposed Action Item Identification:</b>		
Long Term: Earthquake Hazard #4		
<b>Proposed Action Title/Description:</b>		
Develop and implement projects for highest priority facilities from <i>Earthquake Hazard #3: Complete Rapid Visual Assessments to analyze seismic vulnerability of public facilities.</i>		
<b>Rationale for Proposed Action Item:</b>		
<ul style="list-style-type: none"> <li>• In a self hazard analysis, Lane County rated itself as having an above average earthquake risk rating of 175 out of 240. Developing and implementing projects to reduce public facilities' seismic vulnerability can reduce the impact earthquakes will have on the facilities. Such actions help to reduce the County's overall risk to potential earthquakes.</li> <li>• Annex 10, <i>Earthquakes</i>, risk assessment scenarios for earthquakes estimated between \$1.6 and \$1.7 billion in damages to buildings. Developing and implementing projects to reduce public facilities' seismic vulnerability can reduce the impact earthquakes will have on the facilities. Such actions help to reduce the County's overall risk to potential earthquakes.</li> <li>• The <i>State of Oregon's Natural Hazard Mitigation Plan</i> indicates Lane County's probability for a future earthquake event is low (that the county would be likely to have a major earthquake event in the next 75-100 years) but that the county's vulnerability to a future earthquake event is high. Developing and implementing projects to reduce public facilities' seismic vulnerability can reduce the impact earthquakes will have on the facilities. Such actions help to reduce the County's overall risk to potential earthquakes.</li> <li>• The Disaster Mitigation Act of 2000 requires communities to identify mitigation actions that are being considered by the community to reduce the effect that natural hazards will have on the community [201.6(c)(3)(ii)]. Developing and implementing projects to reduce public facilities' seismic vulnerability can reduce the impact earthquakes will have on the facilities. Such actions help to reduce the County's overall risk to potential earthquakes.</li> </ul>		
<b>Ideas for Implementation:</b>		
<ul style="list-style-type: none"> <li>• Using the <i>Rapid Visual Assessments</i> completed for each public facility, identify projects to reduce the seismic vulnerability for the highest prioritized facilities from <i>Earthquake Hazard #3: Complete Rapid Visual Assessments to analyze seismic vulnerability of public facilities.</i></li> <li>• Identify funding source(s) to complete projects.</li> </ul>		
<b>Coordinating Organization:</b>	Lane County Emergency Management	
<b>Internal Partners:</b>	<b>External Partners:</b>	
LCLMD		
<b>Timeline:</b>	<b>If available, estimated cost:</b>	
<u>Short Term</u> (0-2 years)	<u>Long Term</u> (2-4 or more years)	
	2-4 Years	

# Action Item Proposal Form

<b>Proposed Action Item Identification:</b>	
Long Term: Earthquake Hazard #5	
<b>Proposed Action Title/Description:</b>	
Implement recommendations listed in OEM's After Action Report dated August 2005 pertaining to the West Coast Tsunami Warning that was issued on June 14, 2005	
<b>Rationale for Proposed Action Item:</b>	
<ul style="list-style-type: none"> <li>• On June 14, 2005 an Earthquake and Tsunami Warning was issued along the west coast of the United States that served as a real-life test of community readiness for a Tsunami. The After Action Report identifies failures in the overall response system that need to be corrected in order to diminish the impact of a Tsunami.</li> <li>• The After Action Report examines the timelines of the events on June 14, the critical components of emergency operations involved in receiving and issuing tsunami warnings and evacuations, and puts forward ten findings with several recommended actions for local communities to improve or refine existing operations for mitigating future losses during the next Tsunami warning.</li> <li>• Oregon's entire coastline has a delineated tsunami inundation zone according to the 1995 State Senate Bill 379.</li> <li>• The Disaster Mitigation Act of 2000 requires that communities continue to involve the public beyond the original planning process [201.6(c)(4)(ii)]. The recommendations in the report include further educating the public about what to do during a tsunami watch or warning.</li> </ul>	
<b>Ideas for Implementation:</b>	
<ul style="list-style-type: none"> <li>• Develop a detailed tsunami mitigation action plan that incorporates all recommendations for local communities in the After Action Report and assign timelines for completion.</li> <li>• Establish an oversight committee for the tsunami mitigation action plan</li> <li>• Conduct a feasibility analysis of the recommended actions and implement those that require the least amount of resources first. Identify costs and seek out funding for action items that require resources that are above and beyond existing program budgets.</li> </ul>	
<b>Coordinating Organization:</b>	<b>Lane County Emergency Management</b>
<b>Internal Partners:</b>	<b>External Partners:</b>
Public Information Officer	Florence City Manager Florence Police Chief Siuslaw Valley Fire & Rescue Chief Port of Siuslaw Local businesses Florence CERT leaders Other coastal towns Coast Guard
<b>Timeline:</b>	<b>If available, estimated cost:</b>
<u>Short Term</u> (0-2 years)	<u>Long Term</u> (2-4 or more years)
	2-4 Years

# Action Item Proposal Form

<b>Proposed Action Item Identification:</b>		
Ongoing: Flood Hazard #1 (Within FEMA-Mapped Floodplains)		
<b>Proposed Action Title/Description:</b>		
Compile data and prepare GIS maps for structures within the 100-year floodplains. Use the newly available Lane County DFIRMs (Digital Flood Insurance Rate Maps) and the nearly complete & updated parcel base to create an online application for planners, property owners and potential land buyers to quickly and easily understand flood hazards.		
<b>Rationale for Proposed Action Item:</b>		
<ul style="list-style-type: none"> <li>• In a self hazard analysis, Lane County rated itself as having an above average flood risk rating of 165 out of 240. Improving residents' awareness of hazard risks can help the County with outreach and education efforts and help reduce the county's overall flood risk.</li> <li>• The <i>State of Oregon's Natural Hazard Mitigation Plan</i> indicates Lane County's probability for a future flood event is high (that the county would be likely to have a major flooding event in the next 10-35 years) and the county's vulnerability to a future flood event is moderate. Improving residents' awareness of hazard risks can help the County with outreach and education efforts and help reduce the county's overall flood risk.</li> <li>• The Disaster Mitigation Act of 2000 recommends that communities identify the types and numbers of buildings, infrastructure, and critical facilities in hazard areas [201.6(c)(2)(i)]. The County currently does not have the appropriate dataset to complete this step of the risk assessment process. Better risk assessments can assist communities better direct limited mitigation dollars.</li> </ul>		
<b>Ideas for Implementation:</b>		
<ul style="list-style-type: none"> <li>• Use air photos and addressing data in conjunction with new DFIRM data to identify structures within the 100- year floodplain.</li> <li>• Load floodplain layer onto ArcIMS or ArcReader applications developed for Public and in-house use.</li> <li>• Enter elevation data for each structure in the floodplain in Lane County into a GIS format; use data to assist with HAZUS analyses: <ul style="list-style-type: none"> <li>• Gather building elevation data, currently housed in TRS property files, and incorporate it into the County's GIS database.</li> <li>• Possible techniques include creating digital elevation polygons and assigning the elevation value to each structure through a process know as point-in-polygon processing.</li> <li>• Modify the county's GIS data base to include an elevation field</li> <li>• Create better digital elevation models (DEM) with aerial photos.</li> <li>• Update elevation data when FEMA conducts its community review every 2 years.</li> </ul> </li> </ul>		
<b>Coordinating Organization:</b>	Lane County Public Works – GIS	
<b>Internal Partners:</b>		<b>External Partners:</b>
LCLMD, LCEM		LCOG, photogramatrist, USACE, "Regional GIS Partners": City of Springfield, City of Eugene
<b>Timeline:</b>		<b>If available, estimated cost:</b>
Short Term (0-2 years)	Long Term(2-4 or more years)	Approximately \$50,000 - \$70,000
	Ongoing	

# Action Item Proposal Form

<b>Proposed Action Item Identification:</b>	
Short Term: Flood Hazard #2 (Within FEMA-Mapped Floodplains)	
<b>Proposed Action Title/Description:</b>	
Consult with property owners and explore mitigation actions for the 20 Lane County properties on FEMA's national repetitive loss list.	
<b>Rationale for Proposed Action Item:</b>	
<ul style="list-style-type: none"> <li>• If Lane County becomes a participant in the CRS, it will be required to develop a <i>Flood Mitigation Assistance Program</i>. FEMA requires that communities developing <i>Flood Mitigation Assistance Programs</i> work with homeowner within the community who have had repetitive loss due to flooding. Implementing this action item will assist the County in meeting Federal Requirements for CRS and the <i>Flood Mitigation Assistance Program</i>.</li> <li>• In a self hazard analysis, Lane County rated itself as having an above average flood risk rating of 165 out of 240. Improved collaboration with owners of at-risk properties can help the County to better identify ways to reduce its flood risk.</li> <li>• Lane County will receive additional points for the CRS program if the County addresses repetitive flood loss properties through NFIP.</li> <li>• The <i>State of Oregon's Natural Hazard Mitigation Plan</i> indicates Lane County's probability for a future flood event is high (that the county would be likely to have a major flooding event in the next 10-35 years) and the county's vulnerability to a future flood event is moderate. Improved collaboration with owners of at-risk properties can help the County to better identify ways to reduce its flood risk.</li> <li>• One of the National Flood Insurance Program's primary objectives is to reduce the number of properties subject to repetitive loss. This can be accomplished by first identifying those properties that have been impacted by more than one flood event and then elevating or relocating the home, or acquiring the home for demolition and returning the vacant land to open space in perpetuity.</li> </ul>	
<b>Ideas for Implementation:</b>	
<ul style="list-style-type: none"> <li>• Develop an outreach strategy to gain property owners' input. Examples of possible strategies include a mail survey, phone interviews, or community meeting.</li> <li>• Develop mitigation option materials for repetitive loss property owners – acquisition, elevation, etc.</li> <li>• Evaluate connections to Metro Waterway Plan.</li> </ul>	
<b>Coordinating Organization:</b>	<b>Lane County Land Management Division</b>
<b>Internal Partners:</b>	<b>External Partners:</b>
	FEMA, DLCD, USACE
<b>Timeline:</b>	<b>If available, estimated cost:</b>
<u>Short Term</u> (0-2 years)	<u>Long Term</u> (2-4 or more years)
1 year	

## Action Item Proposal Form

<b>Proposed Action Item Identification:</b>	
Short Term: Flood Hazard #3 (Within FEMA-Mapped Floodplains)	
<b>Proposed Action Title/Description:</b>	
Conduct study to understand relationship between the National Weather Service stream gauge data and on-the ground flood impacts felt by landowners along the forks of the Willamette River.	
<b>Rationale for Proposed Action Item:</b>	
<ul style="list-style-type: none"> <li>• Providing NWS with information about how flooding affects property owners allows NWS to compare the property impact information with their stream gauge data. Analyzing connections between stream gauge data and property damage can help improve NWS' ability to provide flood watches and warnings. This can allow landowners to better prepare for and respond to potential flood events.</li> <li>• In a self hazard analysis, Lane County rated itself as having an above average flood risk rating of 165 out of 240. Analyzing stream gauge data with impacts felt by landowners can help improve flood watches and warnings. This can allow landowners to better prepare and respond to potential flood events.</li> <li>• The <i>State of Oregon's Natural Hazard Mitigation Plan</i> indicates Lane County's probability for a future flood event is high (that the county would be likely to have a major flooding event in the next 10-35 years) and the county's vulnerability to a future flood event is moderate. Analyzing stream gauge data with impacts felt by landowners can help improve flood watches and warnings. This allows landowners to better prepare and respond to potential flood events.</li> <li>• The Disaster Mitigation Act of 2000 requires communities to identify how the community will continue to involve the public in the plan maintenance process [201.6(c)(4)(iii)]. Gaining information from landowners about the impacts from flooding they experience is a way to involve the public in the mitigation process and involved in the way in which the public can be notified of potential flood events.</li> <li>• The Disaster Mitigation Act of 2000 requires communities to identify mitigation actions that are being considered by the community to reduce the effect that natural hazards will have on the community [201.6(c)(3)(ii)]. Studying relationships between NWS' stream gauge data and flood impacts felt by landowners can help improve NWS' ability to provide flood watches and warnings. Such actions can help reduce the County's overall risk to floods.</li> </ul>	
<b>Ideas for Implementation:</b>	
<ul style="list-style-type: none"> <li>• Develop an outreach strategy to gain property owners' input on the effects they feel from flooding events. Examples of possible strategies include a mail survey, phone interviews, or community meeting.</li> <li>• Provide NWS with the information obtained from landowners, to allow NWS to analyze the connection between stream gauge data and impacts felt by landowners from flood events.</li> </ul>	
<b>Coordinating Organization:</b>	<b>Lane County Land Management Division</b>
<b>Internal Partners:</b>	<b>External Partners:</b>
	NWS
<b>Timeline:</b>	<b>If available, estimated cost:</b>
<u>Short Term</u> (0-2 years)	<u>Long Term</u> (2-4 or more years)
6 Months – 1 Year	

# Action Item Proposal Form

<b>Proposed Action Item Identification:</b>	
Ongoing: Flood Hazard #4 (Outside FEMA-Mapped Floodplains)	
<b>Proposed Action Title/Description:</b>	
Complete the inventory of locations in Lane County subject to frequent storm water flooding.	
<b>Rationale for Proposed Action Item:</b>	
<ul style="list-style-type: none"> <li>• In a self hazard analysis, Lane County rated itself as having an above average flood risk rating of 165 out of 240. Improved risk assessments can help the County to better identify ways to reduce its flood risk.</li> <li>• The <i>State of Oregon's Natural Hazard Mitigation Plan</i> indicates Lane County's probability for a future flood event is high (that the county would be likely to have a major flooding event in the next 10-35 years) and the county's vulnerability to a future flood event is moderate. Improved risk assessments can help the County to better identify ways to reduce its flood risk.</li> <li>• The Disaster Mitigation Act of 2000 recommends that communities identify the types and numbers of buildings, infrastructure, and critical facilities in hazard areas [201.6(c)(2)(i)]. The County currently does not have the appropriate dataset to complete this step of the risk assessment process. Better risk assessments can assist communities better direct limited mitigation dollars.</li> </ul>	
<b>Ideas for Implementation:</b>	
<ul style="list-style-type: none"> <li>• Amend the floodplain ordinance as requested by FEMA.</li> <li>• Define areas of frequent flooding, compare with past flood occurrences, FEMA flood insurance payouts, County expenditures for flooding repairs, areas of high Citizen complaints during flooding events, etc.</li> <li>• Complete/start to build a database of these locations.</li> <li>• Incorporate this information into the County's GIS database.</li> </ul>	
<b>Coordinating Organization:</b>	Lane County Public Works
<b>Internal Partners:</b>	<b>External Partners:</b>
Sheriff's Office, LCLMD	ODOT, City of Eugene, City of Springfield, other local cities
<b>Timeline:</b>	<b>If available, estimated cost:</b>
Short Term (0-2 years)	Approximately \$75,000 - \$100,000
Long Term (2-4 or more years)	
	Ongoing

# Action Item Proposal Form

<b>Proposed Action Item Identification:</b>	
Ongoing: Flood Hazard #5 (Outside FEMA-Mapped Floodplains)	
<b>Proposed Action Title/Description:</b>	
For locations with repetitive flooding and significant damages or road closures, determine and implement mitigation measures such as upsizing culverts or storm water drainage ditches	
<b>Rationale for Proposed Action Item:</b>	
<ul style="list-style-type: none"> <li>• In a self hazard analysis, Lane County rated itself as having an above average flood risk rating of 165 out of 240. Improved hazard identification and mitigation can help the County to better reduce its flood risk.</li> <li>• The <i>State of Oregon's Natural Hazard Mitigation Plan</i> indicates Lane County's probability for a future flood event is high (that the county would be likely to have a major flooding event in the next 10-35 years) and the county's vulnerability to a future flood event is moderate. Improved hazard identification and mitigation can help the County to better reduce its flood risk.</li> </ul>	
<b>Ideas for Implementation:</b>	
<ul style="list-style-type: none"> <li>• Use information gathered from the inventory of frequent flooding and develop a list of areas in need of repair or maintenance. Inventories of culverts, storm water systems, and roads can be used to assist this process.</li> <li>• Prioritize areas of high flood occurrence to secure funding to improve these areas.</li> <li>• Develop protocols to ensure that this list of areas is kept up-to-date when projects are finished.</li> <li>• All information should be incorporated into the County's GIS database.</li> <li>• Identify already scheduled maintenance projects in areas of frequent flooding and incorporate flood mitigation activities.</li> <li>• Implement mitigation measures through Lane County's Capital Improvement Program.</li> </ul>	
<b>Coordinating Organization:</b>	Lane County Public Works
<b>Internal Partners:</b>	<b>External Partners:</b>
Sheriff's Office, LCLMD	City of Eugene, City of Springfield, ODOT
<b>Timeline:</b>	<b>If available, estimated cost:</b>
<u>Short Term</u> (0-2 years)	Approximately \$5,000 - \$10,000
<u>Long Term</u> (2-4 or more years)	
	Ongoing

# Action Item Proposal Form

<b>Proposed Action Item Identification:</b>	
Short Term: Flood Hazard #6 (Outside FEMA-Mapped Floodplains)	
<b>Proposed Action Title/Description:</b>	
Explore the potential for Lane County to participate in the Community Rating System (CRS) of the National Flood Insurance Program (NFIP)	
<b>Rationale for Proposed Action Item:</b>	
<ul style="list-style-type: none"> <li>• In a self hazard analysis, Lane County rated itself as having an above average flood risk rating of 165 out of 240. Participating in the CRS can help the County to better identify ways to reduce its flood risk and save money by earning reduced insurance premiums.</li> <li>• The <i>State of Oregon's Natural Hazard Mitigation Plan</i> indicates Lane County's probability for a future flood event is high (that the county would be likely to have a major flooding event in the next 10-35 years) and the county's vulnerability to a future flood event is moderate. Participating in the CRS can help the County to better identify ways to reduce its flood risk and save money by earning reduced insurance premiums.</li> <li>• As part of the National Flood Insurance Program (NFIP), CRS recognizes communities' efforts to strengthen floodplain management. CRS rewards those communities that go beyond the minimal requirements of NFIP by reducing flood insurance premiums for a participating community's property owners. The <i>CRS Planning Process</i> is related to FEMA's <i>Flood Mitigation Assistance Program</i> guidelines and NFIP guidelines for flood mitigation planning.</li> </ul>	
<b>Ideas for Implementation:</b>	
<ul style="list-style-type: none"> <li>• Determine CRS eligibility requirements</li> <li>• Research and document current activities that Lane County is already conducting.</li> <li>• Complete and submit CRS participation application</li> <li>• Update LC 16.244 to reflect requirements of the CRS</li> <li>• Establish outreach projects to provide education flood hazards to Lane County Residents</li> <li>• Implement reasonable higher regulatory standards</li> <li>• Obtain digital floodplain maps.</li> </ul>	
<b>Coordinating Organization:</b>	<b>Lane County Land Management Division</b>
<b>Internal Partners:</b>	<b>External Partners:</b>
	FEMA Region X
<b>Timeline:</b>	<b>If available, estimated cost:</b>
<u>Short Term</u> (0-2 years)	<u>Long Term</u> (2-4 or more years)
1 Year	

## Action Item Proposal Form

<b>Proposed Action Item Identification:</b>	
Ongoing: Landslide Hazard #1	
<b>Proposed Action Title/Description:</b>	
Work with the Forest Service to educate landowners on ideas for mitigating the affects of landslides, including establishing evacuation routes.	
<b>Rationale for Proposed Action Item:</b>	
<ul style="list-style-type: none"> <li>Annex 8, <i>Landslides</i>, of Lane County's risk assessment identified the potential for landslides to cause damage to buildings and infrastructure within Lane County: landslides may cause road closures and interruptions to utility services. The annex also identified previous incidents of landslides that affected Lane County: landslides in 1998 and 2000 in the Deadwood area that caused road closures forced residents to find alternate transportation routes. The road closures from the 2000 landslide took several months to clean up and repair. Working with the Forest Service to educate landowners about mitigating the affects of landslides can assist landowners in preparing for and responding to potential landslide events. This can help mitigate the county's overall risk to landslides.</li> <li>The Disaster Mitigation Act of 2000 requires communities to identify how the community will continue to involve the public in the plan maintenance process [201.6(c)(4)(iii)]. Educating landowners on how to mitigate the affects of landslides helps keep the public informed of what is being done with the plan, how the County is working to mitigate its risk to landslides, and allows for feedback and suggestions from the public for improving, updating, and maintaining the plan.</li> </ul>	
<b>Ideas for Implementation:</b>	
<ul style="list-style-type: none"> <li>Determine what public outreach and education tools for informing landowners about the affects of landslides already exist.</li> <li>Work with partner agencies to develop updated or expanded education and outreach information and materials.</li> <li><b>CWPP Land Owner Survey</b> – Survey respondents had the ability to rank their preferred methods of receiving future communication. 59% of survey respondents indicated that mail was their most preferred methods of future communication; 49% preferred newspapers; 42% preferred television; and 42% preferred fact sheets and brochures. The support for these methods of communication to receive information about wildfire can be used to infer support for using these methods to communication information about all natural hazards affecting Lane County.</li> <li>Use methods supported by the CWPP landowner survey to develop dissemination methods for informing landowners of ways to mitigate the affects of landslides:             <ul style="list-style-type: none"> <li>Mailings</li> <li>Television public service announcements</li> <li>Newspaper inserts/spots</li> </ul> </li> </ul>	
<b>Coordinating Organization:</b>	<b>Lane County Land Management Department</b>
<b>Internal Partners:</b>	<b>External Partners:</b>
LCEM, Public Information Officers	ODF, BLM, Local USFS offices
<b>Timeline:</b>	<b>If available, estimated cost:</b>
<u>Short Term</u> (0-2 years)	<u>Long Term</u> (2-4 or more years)
	Ongoing

# Action Item Proposal Form

<b>Proposed Action Item Identification:</b>	
Short Term: Landslide Hazard #2	
<b>Proposed Action Title/Description:</b>	
Expand on DOGAMI provided data to develop inventory of locations where buildings or infrastructure are subject to landslides.	
<b>Rationale for Proposed Action Item:</b>	
<ul style="list-style-type: none"> <li>• Annex 8, <i>Landslides</i>, of Lane County’s risk assessment identified the potential for landslides to cause damage to buildings and infrastructure within Lane County: landslides may cause road closures and interruptions to utility services. The annex also identified previous incidents of landslides that affected Lane County: landslides in 1998 and 2000 in the Deadwood area that caused road closures forced residents to find alternate transportation routes. The road closures from the 2000 landslide took several months to clean up and repair. Expanding inventories that identify buildings and infrastructure that are at risk to landslides can help the County to better identify and prioritize projects that can assist the County in mitigating its overall risk to landslides.</li> <li>• The Disaster Mitigation Act of 2000 requires communities to identify the community’s vulnerability to natural hazards, and recommends identifying the types and numbers of buildings and infrastructure that could be affected by hazards [201.6(c)(2)(ii)(A)]. Expanding the inventory of buildings that are vulnerable to landslides helps the county assess its overall vulnerability to landslides. A more accurate assessment of its landslide vulnerability can assist the county in identifying and selecting appropriate methods for landslide risk mitigation.</li> </ul>	
<b>Ideas for Implementation:</b>	
<ul style="list-style-type: none"> <li>• Examine existing DOGAMI provided data.</li> <li>• Identify locations and buildings not included in DOGAMI data that could be subject to landslides.</li> <li>• Site-visit identified locations and buildings to determine real vulnerability landslides.</li> <li>• Include locations and buildings to DOGAMI data that are determined to be vulnerable to landslides.</li> </ul>	
<b>Coordinating Organization:</b>	<b>Lane County Public Works – GIS</b>
<b>Internal Partners:</b>	<b>External Partners:</b>
LCLMD, LCEM	DOGAMI
<b>Timeline:</b>	<b>If available, estimated cost:</b>
<u>Short Term</u> (0-2 years)	<u>Long Term</u> (2-4 or more years)

## Action Item Proposal Form

<b>Proposed Action Item Identification:</b>	
Short Term: Landslide Hazard #3	
<b>Proposed Action Title/Description:</b>	
Consider adoption of a hillside development ordinance with the intent of monitoring and regulating grading, excavation, development and cut and fill activities on steep or unstable slopes. Ordinances of this kind have been used to promote public safety by controlling land disturbing activities in hazardous areas that may contribute to or be impacted by debris flows.	
<b>Rationale for Proposed Action Item:</b>	
<ul style="list-style-type: none"> <li>• Annex 8, <i>Landslides</i>, of Lane County’s risk assessment identified slopes between 50% and 70% as having moderate risks to shallow rapid landslides, and slopes between 70% and 80% as having high risks to shallow rapid landslides. Limiting the types of development that can occur on such slopes can help mitigate the county’s overall risk to landslides.</li> <li>• <b>CWPP Landowner Survey</b> – 83% of survey respondents supported the use of building construction standards for new developments in high hazard areas to reduce the community’s risk to wildland fire. The support for building construction standards to mitigate wildfire risk can be used to infer support for building construction standards to mitigate risk for all natural hazards affecting Lane County.</li> <li>• The Disaster Mitigation Act of 2000 requires communities to identify actions and projects that reduce the effects of hazards on both new and existing buildings and infrastructure [201.6(c)(3)(ii)]. Adopting development ordinances that would regulate grading, excavation, development, and cut and fill activities could help limit development that would increase a slope’s vulnerability to landslides, or limit development that could increase the potential for loss of life or property due to landslides. Such actions would help the county mitigate its risk to landslides.</li> </ul>	
<b>Ideas for Implementation:</b>	
<ul style="list-style-type: none"> <li>•</li> </ul>	
<b>Coordinating Organization:</b>	<b>Lane County Land Management Department</b>
<b>Internal Partners:</b>	<b>External Partners:</b>
LCPW, LCEM	Lane County Board of Commissioners
<b>Timeline:</b>	<b>If available, estimated cost:</b>
<u>Short Term</u> (0-2 years)	<u>Long Term</u> (2-4 or more years)
2 Years	

# Action Item Proposal Form

<b>Proposed Action Item Identification:</b>		
Short-Term: Landslide Hazard #4		
<b>Proposed Action Title/Description:</b>		
Develop a GIS data layer that identifies areas that have become more vulnerable to landslides as a result of a wildfire event.		
<b>Rationale for Proposed Action Item:</b>		
<ul style="list-style-type: none"> <li>• Based on over 20 years of post fire assessment studies, the USFS has identified various criteria that can be used to predict whether an area would be highly susceptible to landslides following a wildfire event (i.e., based on soil characteristics, geology, slope, climate, geomorphology). Use of this information would allow the County to map potential landslide areas in relation to critical infrastructure and develop preplanning to prevent wildfire in these areas using various mitigation measures. Such actions can assist the County in mitigating its overall risk to landslides.</li> <li>• The Disaster Mitigation Act of 2000 requires communities to identify the community's vulnerability to natural hazards, and recommends identifying the types and numbers of buildings and infrastructure that could be affected by hazards [201.6(c)(2)(ii)(A)]. Identifying areas that may be more vulnerable to landslides after a wildfire event can assist the County in better identifying its vulnerability to landslides. A better identification of its landslide vulnerability can assist the County in better identifying and prioritizing projects that can assist the County in mitigating its overall risk to landslides.</li> </ul>		
<b>Ideas for Implementation: (Optional)</b>		
<ul style="list-style-type: none"> <li>• Develop GIS data layers necessary for wildfire landslide assessment (many of the data layers already exist but may need some cleanup or enhancement).</li> <li>• Work with USFS to assign basic weightings to layers based on specific attributes.</li> <li>• Create GIS overlay to produce landslide hazard index in post wildfire conditions.</li> </ul>		
<b>Coordinating Organization:</b>	<b>Eugene Water and Electric Board</b>	
<b>Internal Partners:</b>	<b>External Partners:</b>	
	USFS LCOG LCPW – GIS BLM ODF	
<b>Timeline:</b>	<b>If available, estimated cost:</b>	
<u>Short Term</u> (0-2 years)	<u>Long Term</u> (2-4 or more years)	\$15,000 - \$30,000
2 years		
<b>Form Submitted by:</b>	<b>Karl Morgenstern, EWEB</b>	

# Action Item Proposal Form

<b>Proposed Action Item Identification:</b>	
Ongoing: Winter Storm Hazard #1	
<b>Proposed Action Title/Description:</b>	
Work with utilities to establish agreed upon standards for all utilities operating in Lane County regarding tree pruning around transmission lines and trunk distribution lines.	
<b>Rationale for Proposed Action Item:</b>	
<ul style="list-style-type: none"> <li>Annex 7, <i>Winter Storms</i>, of Lane County’s risk assessment identified tree falls during winter storm events as a risk to the county. During a winter storm, tree falls have the potential to damage buildings and infrastructure, block roadways, and down overhead power lines, causing electric power failures. Tree pruning helps reduce the vulnerability of trees to winter storms, mitigating the potential damage they could cause to buildings and infrastructure during a winter storm. Standards for completing tree pruning jobs helps to maximize time, money, and other resources.</li> <li>The <i>State of Oregon’s Natural Hazard Mitigation Plan</i> indicates Lane County’s probability for a future winter storm event is high (that the county would be likely to have a major winter storm event in the next 10-35 years) and the county’s vulnerability to a future winter storm event is high. Tree pruning helps reduce the vulnerability of trees to winter storms, mitigating the potential damage they could cause to buildings and infrastructure during a winter storm. Standards for completing tree pruning jobs helps to maximize time, money, and other resources.</li> <li>The Disaster Mitigation Act of 2000 requires communities to identify actions and projects that reduce the effects of hazards on both new and existing buildings and infrastructure [201.6(c)(3)(ii)]. Developing public/private partnerships to educate the public can help pool resources for mitigation. Tree pruning will help reduce the trees’ vulnerability to winter storms. Reducing tree vulnerability reduces the risk that trees will be downed in a winter storm, damaging buildings and infrastructure. Having pruning standards before tree pruning begins assists work crews responsible for pruning: standards allow work crews to know they are sufficiently completing pruning jobs the first time out, maximizing time, money, and other resources.</li> </ul>	
<b>Ideas for Implementation:</b>	
<ul style="list-style-type: none"> <li>Determine if any standards already exist.</li> <li>Hold meetings with utilities to determine and identify standards that can be agreed upon by all.</li> </ul>	
<b>Coordinating Organization:</b>	<b>Lane County Emergency Management</b>
<b>Internal Partners:</b>	<b>External Partners:</b>
	All utilities
<b>Timeline:</b>	<b>If available, estimated cost:</b>
<u>Short Term</u> (0-2 years)	<u>Long Term</u> (2-4 or more years)
Ongoing	

# Action Item Proposal Form

<b>Proposed Action Item Identification:</b>	
Ongoing: Winter Storms Hazard #2	
<b>Proposed Action Title/Description:</b>	
Provide information brochures to property owners to encourage tree pruning near service drops	
<b>Rationale for Proposed Action Item:</b>	
<ul style="list-style-type: none"> <li>• Annex 7, <i>Winter Storms</i>, of Lane County’s risk assessment identified tree falls as a risk to the county during winter storm events. During a winter storm, tree falls have the potential to damage buildings and infrastructure, block roadways, and down overhead power lines, causing electric power failures. Providing information brochures helps educate people on the hazards that unpruned trees can cause during a winter storm, and the importance of tree pruning near service drops. This can help mitigate the county’s overall risk to winter storms.</li> <li>• The <i>State of Oregon’s Natural Hazard Mitigation Plan</i> indicates Lane County’s probability for a future winter storm event is high (that the county would be likely to have a major winter storm event in the next 10-35 years) and the county’s vulnerability to a future winter storm event is high. Providing information brochures helps educate people on the hazards that unpruned trees can cause during a winter storm, and the importance of tree pruning near service drops. This can help mitigate the county’s overall risk to winter storms.</li> <li>• The Disaster Mitigation Act of 2000 requires communities to identify how the community will continue to involve the public in the plan maintenance process [201.6(c)(4)(iii)]. Providing information brochures helps educate people on the hazards that unpruned trees can cause during a winter storm, and the importance of tree pruning near service drops. Conducting public outreach also keeps the public informed of what is being done with the plan, and allows for public feedback and input into the plan and it’s implemented actions.</li> </ul>	
<b>Ideas for Implementation:</b>	
<ul style="list-style-type: none"> <li>• <b>Community Wildfire Protection Plan Land Owner Survey</b> – Survey respondents indicated their top preferences for receiving information in the future. 59% of survey respondents indicated that their most preferred method of future communication was through the mail and 42% preferred fact sheets and brochures. The support for these methods of communication to receive information about wildfire can be used to infer support for using these methods to communication information about all natural hazards affecting Lane County.</li> <li>• Acquire existing brochures, or develop brochures or mailers, with information for homeowners about tree pruning.</li> </ul>	
<b>Coordinating Organization:</b>	<b>Lane Electric Cooperative</b>
<b>Internal Partners:</b>	<b>External Partners:</b>
<b>Timeline:</b>	<b>If available, estimated cost:</b>
<u>Short Term</u> (0-2 years)	<u>Long Term</u> (2-4 or more years)
Ongoing	

# Action Item Proposal Form

<b>Proposed Action Item Identification:</b>	
Ongoing: Winter Storm Hazards #3	
<b>Proposed Action Title/Description:</b>	
Determine undergrounding requirements for utility extension; assess and evaluate for any needed improvements in the requirements.	
<b>Rationale for Proposed Action Item:</b>	
<ul style="list-style-type: none"> <li>• Annex 7, <i>Winter Storms</i>, of Lane County’s risk assessment identified tree falls during winter storm events as a risk to overhead power lines. During a winter storm, tree falls have the potential to down overhead power lines, causing electric power failures. Undergrounding utility extensions to reduce the effect of ice loading and tree falls can help mitigate the county’s risk to winter storms, and limit disruptions in service in the event of a winter storm.</li> <li>• The Disaster Mitigation Act of 2000 requires communities to identify actions and projects that reduce the effects of hazards on both new and existing buildings and infrastructure[201.6(c)(3)(ii)]. Assessing and evaluating needed improvements for undergrounding utility extensions, can assist the County in determining what further actions are needed to help mitigate Lane County’s risk to winter storms.</li> </ul>	
<b>Ideas for Implementation:</b>	
<ul style="list-style-type: none"> <li>•</li> </ul>	
<b>Coordinating Organization:</b>	Lane County Land Management Division
<b>Internal Partners:</b>	<b>External Partners:</b>
<b>Timeline:</b>	<b>If available, estimated cost:</b>
Short Term (0-2 years)	Long Term(2-4 or more years)
	Ongoing

# Action Item Proposal Form

<b>Proposed Action Item Identification:</b>	
Ongoing: Winter Storm Hazard #4	
<b>Proposed Action Title/Description:</b>	
Conduct outreach campaign to remind government, private sector and non-government agencies to keep sidewalks and roads free of ice during severe winter storms.	
<b>Rationale for Proposed Action Item:</b>	
<ul style="list-style-type: none"> <li>• Annex 7, <i>Winter Storms</i>, of Lane County’s risk assessment identified ice as a risk to the county during winter storm events. During a winter storm, ice has the potential to cause injury to people (due to slipping and/or falling) and limit access and egress to/from roads and areas. Educating businesses and agencies on the importance of clearing ice from sidewalks and roads can helping mitigate the county’s risk to winter storms.</li> <li>• The <i>State of Oregon’s Natural Hazard Mitigation Plan</i> indicates Lane County’s probability for a future winter storm event is high (that the county would be likely to have a major winter storm event in the next 10-35 years) and the county’s vulnerability to a future winter storm event is high. Collaborating with and involving the public in mitigation efforts can help the County to better reduce its winter storm risk.</li> <li>• The Disaster Mitigation Act of 2000 requires communities to identify how the community will continue to involve the public in the plan maintenance process [201.6(c)(4)(iii)]. Conducting public outreach helps educate people on the risks posed by icy sidewalks and roads, and suggest ways they can mitigate the risk. Conducting public outreach also keeps the public informed of what is being done with the plan, and allows for feedback and suggestions from the public for improving, updating, and maintaining the plan.</li> </ul>	
<b>Ideas for Implementation:</b>	
<ul style="list-style-type: none"> <li>• Determine most appropriate and effective methods and messages for reaching targeted audiences.</li> <li>• Provide tips for how to clear sidewalks.</li> <li>• Determine funding source(s) for conducting outreach methods.</li> <li>• Get sidewalk information from City of Eugene and City of Springfield, and use information to target commercial addresses within range of sidewalks.</li> <li>• Incorporate action item into Lane County’s Emergency Response Plan.</li> </ul>	
<b>Coordinating Organization:</b>	<b>Lane County Emergency Management</b>
<b>Internal Partners:</b>	<b>External Partners:</b>
Public Information Officers	City of Eugene, City of Springfield, Radio Stations, Television Stations, Newspapers
<b>Timeline:</b>	<b>If available, estimated cost:</b>
<u>Short Term</u> (0-2 years)	Approximately \$2,000 - \$5,000
<u>Long Term</u> (2-4 or more years)	
	Ongoing

# Action Item Proposal Form

<b>Proposed Action Item Identification:</b>		
Ongoing: Winter Storm Hazard #5		
<b>Proposed Action Title/Description:</b>		
Conduct public outreach campaigns in early fall each year to remind people how to get around under adverse weather conditions (i.e., driving on icy roads, etc.).		
<b>Rationale for Proposed Action Item:</b>		
<ul style="list-style-type: none"> <li>• Annex 7, <i>Winter Storms</i>, of Lane County’s risk assessment identified tree falls, ice, and snow as risks to the county during winter storm events. During a winter storm, tree falls, ice, and snow have the potential to block and/or limit access and egress to/from roads and areas. Educating people about ways to get around more safely during adverse weather conditions can help mitigate the amount of injuries that could result from unsafe travel.</li> <li>• The <i>State of Oregon’s Natural Hazard Mitigation Plan</i> indicates Lane County’s probability for a future winter storm event is high (that the county would be likely to have a major winter storm event in the next 10-35 years) and the county’s vulnerability to a future winter storm event is high. Collaborating with and involving the public in mitigation efforts can help the County to better reduce its winter storm risk.</li> <li>• The Disaster Mitigation Act of 2000 requires communities to identify how the community will continue to involve the public in the plan maintenance process [201.6(c)(4)(iii)]. Conducting public outreach helps educate people on the risks posed by adverse weather conditions, and suggest ways they can mitigate the risk. Conducting public outreach also keeps the public informed of what is being done with the plan, and allows for feedback and suggestions from the public for improving, updating, and maintaining the plan.</li> </ul>		
<b>Ideas for Implementation:</b>		
<ul style="list-style-type: none"> <li>• Determine most appropriate and effective methods and messages for reaching targeted audiences.</li> <li>• Determine funding source(s) for conducting decided upon outreach methods.</li> <li>• Identify and acquire any existing information on public outreach to educate the public on adverse weather conditions.</li> <li>• Develop outreach materials that provide the public with tips on what to carry with them and in their cars during adverse weather, how to make emergency kits, etc.</li> <li>• Incorporate action item into Lane County’s Emergency Operations Plan.</li> </ul>		
<b>Coordinating Organization:</b>	Lane County Public Works	
<b>Internal Partners:</b>		<b>External Partners:</b>
Sheriff’s Office		Radio Stations Television Stations <i>Newspapers</i>
<b>Timeline:</b>		<b>If available, estimated cost:</b>
Short Term (0-2 years)	Long Term (2-4 or more years)	\$2,000 - \$5,000
	Ongoing	

## Action Item Proposal Form

<b>Proposed Action Item Identification:</b>	
Long Term: Winter Storm Hazard #6	
<b>Proposed Action Title/Description:</b>	
Identify which critical facilities in Lane County need backup power and emergency operations plans to deal with power outages.	
<b>Rationale for Proposed Action Item:</b>	
<ul style="list-style-type: none"> <li>• Annex 7, <i>Winter Storms</i>, of Lane County's risk assessment identified tree falls during winter storm events as a risk to the county. During a winter storm, tree falls have the potential to damage buildings and infrastructure, and down overhead power lines, causing electric power failures. Providing backup power to critical facilities in the event of a winter storm can help decrease disruptions in services, mitigating the county's risk to winter storms.</li> <li>• The <i>State of Oregon's Natural Hazard Mitigation Plan</i> indicates Lane County's probability for a future winter storm event is high (that the county would be likely to have a major winter storm event in the next 10-35 years) and that the county's vulnerability to a future winter storm event is high. Providing backup power to critical facilities in the event of a winter storm can help decrease disruptions in services, mitigating the county's risk to winter storms.</li> <li>• The Disaster Mitigation Act of 2000 requires communities to identify actions and projects that reduce the effects of hazards on the community [201.6(c)(3)(ii)]. Providing backup power to critical facilities in the event of a winter storm can help decrease disruptions in services, mitigating the county's risk to winter storm events.</li> </ul>	
<b>Ideas for Implementation:</b>	
<ul style="list-style-type: none"> <li>• Survey operations managers of critical facilities to develop gap analysis.</li> <li>• Encourage facility operators to develop plans for establishing back up power.</li> </ul>	
<b>Coordinating Organization:</b>	<b>Lane County Emergency Management</b>
<b>Internal Partners:</b>	<b>External Partners:</b>
All Lane County departments and agencies	
<b>Timeline:</b>	<b>If available, estimated cost:</b>
<u>Short Term</u> (0-2 years)	<u>Long Term</u> (2-4 or more years)
1-2 years	

# Action Item Proposal Form

<b>Proposed Action Item Identification:</b>	
Short Term: Winter Storm Hazard #7	
<b>Proposed Action Title/Description:</b>	
Develop public/private partnership (i.e., public works and arborist society) to educate property owners how to evaluate the health of trees on their property.	
<b>Rationale for Proposed Action Item:</b>	
<ul style="list-style-type: none"> <li>• Annex 7, <i>Winter Storms</i>, of Lane County’s risk assessment identified tree falls during winter storm events as a risk to the county. During a winter storm, tree falls have the potential to damage buildings and infrastructure, block roadways, and down overhead power lines, causing electric power failures. Evaluating tree health to reduce trees’ vulnerability to winter storms can help mitigate the county’s risk to winter storms.</li> <li>• The <i>State of Oregon’s Natural Hazard Mitigation Plan</i> indicates Lane County’s probability for a future winter storm event is high (that the county would be likely to have a major winter storm event in the next 10-35 years) and the county’s vulnerability to a future winter storm event is high. Collaborative partnerships and public education can help the County to better reduce its winter storm risk.</li> <li>• The Disaster Mitigation Act of 2000 requires communities to identify actions and projects that reduce the effects of hazards on both new and existing buildings and infrastructure [201.6(c)(3)(ii)]. Developing public/private partnerships to educate the public can help pool resources for mitigation. Outreach provided by such a group could educate property owners, assisting them to reduce the vulnerability of trees on their property to winter storms, helping reduce the county’s overall risk to winter storms.</li> </ul>	
<b>Ideas for Implementation:</b>	
<ul style="list-style-type: none"> <li>• Develop a list of agencies, organizations, etc., who would be able to provide assistance in educating property owners about the health of the trees on their property.</li> <li>• Contact those agencies, organizations, etc., to see if they would be interested and willing to contribute to a partnership to help educate property owners about the health of the trees on their property.</li> <li>• Form partnerships with interested parties, and develop methods for outreach to educate property owners about evaluating the health of the trees on their property.</li> <li>• Develop incentives for property owners to participate in monitoring and maintaining the health of the trees on their property, such as free arborist visits and assessments of trees.</li> <li>• Partner with local utilities to provide informational inserts in monthly utility bills.</li> </ul>	
<b>Coordinating Organization:</b>	<b>Lane County Public Works</b>
<b>Internal Partners:</b>	<b>External Partners:</b>
LCLMD	Arborists Society, EWEB, other utilities
<b>Timeline:</b>	<b>If available, estimated cost:</b>
<u>Short Term</u> (0-2 years)	<u>Long Term</u> (2-4 or more years)
1 Year	

# Action Item Proposal Form

<b>Proposed Action Item Identification:</b>	
Short Term: Winter Storm Hazard #8	
<b>Proposed Action Title/Description:</b>	
Develop a hazardous tree inventory for all County properties.	
<b>Rationale for Proposed Action Item:</b>	
<ul style="list-style-type: none"> <li>• Annex 7, <i>Winter Storms</i>, of Lane County’s risk assessment identified tree falls during winter storm events as a risk to the county. During a winter storm, tree falls have the potential to damage buildings and infrastructure, block roadways, and down overhead power lines, causing electric power failures. Developing an inventory of trees that may be more vulnerable to damage from winter storms can help the County in better identifying and prioritizing projects that can assist the County in mitigating its overall risk to winter storms.</li> <li>• The <i>State of Oregon’s Natural Hazard Mitigation Plan</i> indicates Lane County’s probability for a future winter storm event is high (that the county would be likely to have a major winter storm event in the next 10-35 years) and the county’s vulnerability to a future winter storm event is high. Developing an inventory of hazardous trees can help the County identify which trees might be more vulnerable to damage caused by winter storms. Such information can help the County in better identifying and prioritizing projects that can assist the County in mitigating its overall risk to winter storms.</li> <li>• The Disaster Mitigation Act of 2000 requires communities to identify actions and projects that reduce the effects of hazards on the community [201.6(c)(3)(ii)]. Developing an inventory of hazardous trees can help the County identify which trees might be more vulnerable to damage caused by winter storms. Such information can help the County in better identifying and prioritizing projects that can assist the County in mitigating its overall risk to winter storms.</li> </ul>	
<b>Ideas for Implementation:</b>	
<ul style="list-style-type: none"> <li>• Develop a list of agencies, organizations, etc., who may have information about hazardous trees that may be at increased risk to damage caused by winter storms.</li> <li>• Contact those agencies, organizations, etc., to see if they could provide information to help develop the hazardous tree inventory.</li> <li>• Use GIS to create an inventory of identified hazardous trees.</li> <li>• Develop methods for maintaining and updating the inventory.</li> <li>• Develop methods for informing agencies, which may need such information, that the inventory exists and ways that they can obtain a copy of the inventory.</li> </ul>	
<b>Coordinating Organization:</b>	Lane County Public Works – Parks
<b>Internal Partners:</b>	<b>External Partners:</b>
LCLMD	Arborists Society, EWEB, other utilities
<b>Timeline:</b>	<b>If available, estimated cost:</b>
<u>Short Term</u> (0-2 years)	<u>Long Term</u> (2-4 or more years)
1 Year	

# Action Item Proposal Form

<b>Proposed Action Item Identification:</b>	
Long Term: Winter Storms Hazard #9	
<b>Proposed Action Title/Description:</b>	
Consider upgrading lines and poles to improve wind/ice loading, undergrounding critical lines, and adding interconnect switches to allow alternative feed paths and disconnect switches to minimize outage areas	
<b>Rationale for Proposed Action Item:</b>	
<ul style="list-style-type: none"> <li>• Annex 7, <i>Winter Storms</i>, of Lane County’s risk assessment identified tree falls during winter storm events as a risk to overhead power lines. During a winter storm, tree falls have the potential to down overhead power lines, causing electric power failures. Adding upgrades to utility lines, poles, and extensions to reduce the effect of ice loading and tree falls can help mitigate the county’s risk to winter storms, and limit disruptions in service in the event of a winter storm.</li> <li>• The Disaster Mitigation Act of 2000 requires communities to identify actions and projects that reduce the effects of hazards on both new and existing buildings and infrastructure [201.6(c)(3)(ii)]. Assessing and evaluating needed improvements for utility extensions, lines, and poles can assist the County in determining what further actions are needed to help mitigate Lane County’s risk to winter storms.</li> </ul>	
<b>Ideas for Implementation:</b>	
<ul style="list-style-type: none"> <li>• Determine existing conditions of lines and poles. Involve stakeholders to identify if and where upgrades are feasible.</li> <li>• Identify requirements for undergrounding critical lines. Involve stakeholders to identify if and how undergrounding lines could be possible and feasible.</li> <li>• Identify requirements for adding interconnect switches. Involve stakeholders to identify if and how adding interconnect switches is possible and feasible.</li> </ul>	
<b>Coordinating Organization:</b>	Lane Electric Cooperative
<b>Internal Partners:</b>	<b>External Partners:</b>
<b>Timeline:</b>	<b>If available, estimated cost:</b>
Short Term (0-2 years)	Long Term (2-4 or more years)
	5 Years

# Action Item Proposal Form

<b>Proposed Action Item Identification:</b>	
Short Term: Volcanic Hazards #1	
<b>Proposed Action Title/Description:</b>	
Update public emergency notification procedures for ash fall events	
<b>Rationale for Proposed Action Item:</b> (What critical issues will the action address?)	
<ul style="list-style-type: none"> <li>• Annex 11, <i>Volcanic Hazards</i>, of Lane County’s risk assessment identified ash falls as the volcanic hazard that Lane County would most likely experience. Updating public emergency notification procedures for ash fall events would improve the public and emergency personnel’s abilities to respond to an ash fall event, helping mitigate the county’s risk to ash falls.</li> <li>• Pre-planning for event can help minimize the effort and cost needed to respond to an event.</li> </ul>	
<b>Ideas for Implementation:</b>	
<ul style="list-style-type: none"> <li>• Include Central Cascades Volcanic Plan as an addendum</li> <li>• Add ash fall events to communication centers notification protocols.</li> <li>• Develop instructions for distribution of alert to the public regarding what to do in an ash fall event.</li> <li>• Incorporate action item into Lane County’s Emergency Operations Plan.</li> </ul>	
<b>Coordinating Organization:</b>	<b>Lane County Emergency Management</b>
<b>Internal Partners:</b>	<b>External Partners:</b>
Public Information Officers	Other communication centers, Media outlets, Central Cascades Volcano Committee
<b>Timeline:</b>	<b>If available, estimated cost:</b>
<u>Short Term</u> (0-2 years)	<u>Long Term</u> (2-4 or more years)
1-2 years	

# Action Item Proposal Form

<b>Proposed Action Item Identification:</b>		
Short Term: Volcanic Hazard #2		
<b>Proposed Action Title/Description:</b>		
Update emergency response planning for ash fall events.		
<b>Rationale for Proposed Action Item:</b> (What critical issues will the action address?)		
<ul style="list-style-type: none"> <li>• Annex 11, <i>Volcanic Hazards</i>, of Lane County's risk assessment identified ash falls as the volcanic hazard that Lane County would most likely experience. Updating the county's emergency response to an ash fall event will assist emergency personnel in responding to and assisting the public during an ash fall, mitigating the county's risk to ash fall events.</li> <li>• Pre-planning for event can help minimize the effort and cost needed to respond to an event.</li> </ul>		
<b>Ideas for Implementation:</b>		
<ul style="list-style-type: none"> <li>• Continue Lane County's participation in the Central Cascades Volcanic Planning effort.</li> <li>• Pre-identify incident command posts for coordinating a regional response.</li> <li>• Incorporate action item into Lane County's Emergency Operations Plan.</li> </ul>		
<b>Coordinating Organization:</b>	<b>Lane County Emergency Management</b>	
<b>Internal Partners:</b>		<b>External Partners:</b>
		City of Eugene, other affected counties, Central Cascades Volcano Committee
<b>Timeline:</b>		<b>If available, estimated cost:</b>
<u>Short Term</u> (0-2 years)	<u>Long Term</u> (2-4 or more years)	\$1,500 yearly
1-2 years		

# Action Item Proposal Form

<b>Proposed Action Item Identification:</b>	
Short Term: Volcanic Hazard #3	
<b>Proposed Action Title/Description:</b>	
Evaluate capability of water treatment plants to deal with high turbidity from ash falls and upgrade treatment facilities and emergency response plans to deal with ash falls.	
<b>Rationale for Proposed Action Item:</b>	
<ul style="list-style-type: none"> <li>• Annex 11, <i>Volcanic Hazards</i>, of Lane County’s risk assessment indicates the potential for ash fall events to impact the water systems within Lane County. Ash fall events have the potential to cause high water turbidity and operational problems at water treatment facilities. Upgrading water treatment facilities’ ability to respond to ash fall events can help reduce the disruption to services that an ash fall event may cause.</li> <li>• The Disaster Mitigation Act of 2000 requires communities to identify actions and projects that reduce the effects of hazards on both new and existing buildings and infrastructure [201.6(c)(3)(ii)]. Upgrading treatment facilities to deal with the high turbidity of the water caused by ash fall events will help the county mitigate its risk to ash falls, and reduce the disruption in services that an ash fall event may cause.</li> </ul>	
<b>Ideas for Implementation:</b>	
<ul style="list-style-type: none"> <li>• Form a team or task force of Lane County Advisory Committee members to:             <ul style="list-style-type: none"> <li>• Examine the current capabilities of water treatment plants to deal with high turbidity from ash fall events.</li> <li>• Identify ways to upgrade the capabilities of the water treatment plants to respond to ash fall events.</li> <li>• Determine feasibility and costs associated with implementing identified improvements and upgrades.</li> </ul> </li> <li>• Incorporate action item into Lane County’s Emergency Operations Plan.</li> </ul>	
<b>Coordinating Organization:</b>	<b>Eugene Water and Electric Board</b>
<b>Internal Partners:</b>	<b>External Partners:</b>
	USACE, Central Cascades Volcano Committee
<b>Timeline:</b>	<b>If available, estimated cost:</b>
<u>Short Term</u> (0-2 years)	<u>Long Term</u> (2-4 or more years)
1-2 years	

# Action Item Proposal Form

<b>Proposed Action Item Identification:</b>	
Short Term: Volcanic Hazards #4	
<b>Proposed Action Title/Description:</b>	
Use the high resolution maps developed by U.S. Geological Survey (that model the scenarios of likely mud flow, avalanche debris and lahar paths in the event of an eruption from the South Sister) to assist in updating the emergency response plan, including public notification and evacuation routes.	
<b>Rationale for Proposed Action Item:</b> (What critical issues will the action address?)	
<ul style="list-style-type: none"> <li>• Following the events of 2005's Hurricane Katrina, Lane County recognized a need and an opportunity to assess the worst probably case scenario for a volcanic eruption event in Lane County. Preparing maps of mud flow, avalanche debris, and lahar paths from the South Sister bulge can provide the County with information about what to expect from a major volcanic eruption: would major rivers be temporarily dammed and would subsequent failure cause a wave of water and flooding; what areas, infrastructure, populations, etc., would be affected and to what extent. A better understanding of the County's vulnerability to a volcanic eruption from South Sister can assist the County in better identifying methods for mitigating the risk from this hazard.</li> <li>• Lane County currently does not have information regarding the worst probable case scenario for a volcanic eruption event. The US Geological Survey has completed a simulation study of a major eruption from the South Sister bulge area and mapped using GIS mud flow, avalanche debris and lahar paths. Gathering this information for the South Sister in Lane County would assist the County in knowing the worst probable case scenario and in identifying methods for preparing for and responding to the scenario.</li> <li>• The Central Cascades Facilitating Committee completed a draft <i>Central Cascades Coordination Plan: Coordinating Efforts Among Governmental Agencies in the Event of Volcanic Unrest in the Central Cascades, Oregon (April 2005)</i>. It may be beneficial to evaluate this plan for inclusion in Lane County's mitigation and/or response planning efforts</li> </ul>	
<b>Ideas for Implementation: (Optional)</b>	
<ul style="list-style-type: none"> <li>• Obtain the USGS volcanic eruption data for South Sister and include the regional GIS data repository.</li> <li>• Evaluate mud flow, avalanche debris and lahar paths to determine evacuation routes and impacts to critical infrastructure in the area. Special attention should be paid for areas that major earth flows cross rivers or large tributaries. This event may cause temporary damming followed by failure and flooding. Additional modeling as a dam failure scenario may provide better information regarding additional inundation areas.</li> <li>• Volcanic eruptions usually involve seismic activities, so there should be a link to the earthquake portion of the Lane County Natural Hazards Mitigation Plan.</li> <li>• Develop GIS-based evacuation plans and identify shelters with caches of supplies for population potentially effected.</li> </ul>	
<b>Coordinating Organization:</b>	<b>Eugene Water and Electric Board – Source Protection Program</b>
<b>Internal Partners:</b>	<b>External Partners:</b>
EWEB – Engineering Lane Co Emergency Management	Red Cross, USGS, USACE, NWS, USFS
<b>Timeline:</b>	<b>If available, estimated cost:</b>
<u>Short Term</u> (0-2 years)	\$25,000 to \$35,000
<u>Long Term</u> (2-4 or more years)	
2 years	

# Action Item Proposal Form

<b>Proposed Action Item Identification:</b>		
Ongoing: Dam Safety Hazard #1		
<b>Proposed Action Title/Description:</b>		
Train first responders on alert/warning systems, emergency plan and evacuation routes		
<b>Rationale for Proposed Action Item:</b>		
<b>Ideas for Implementation:</b>		
<b>Coordinating Organization:</b>	Eugene Water and Electric Board	
<b>Internal Partners:</b>		<b>External Partners:</b>
LCEM		
<b>Timeline:</b>		<b>If available, estimated cost:</b>
Short Term (0-2 years)	Long Term (2-4 or more years)	

# Action Item Proposal Form

<b>Proposed Action Item Identification:</b>	
Ongoing: Dam Safety Hazard #2	
<b>Proposed Action Title/Description:</b>	
Encourage the Corps of Engineers to complete seismic vulnerability assessments for dams upstream of heavily populated areas in Lane County and to make seismic improvements as necessary.	
<b>Rationale for Proposed Action Item:</b>	
<ul style="list-style-type: none"> <li>• Following the events of 2005's Hurricane Katrina, Lane County recognized a need and an opportunity to evaluate the seismic vulnerability of its dams. Encouraging the Army Corps of Engineers, the entity that controls the dams, to complete seismic vulnerability assessments for the dams upstream of heavily populated areas can assist the County in better understanding the vulnerability of its dams. Information about seismic vulnerability of Eugene Water &amp; Electric Board dams in the McKenzie should also be incorporated into this effort. A better understanding of dam seismic vulnerability can assist the County in better identifying methods for mitigating the risk of dam vulnerability.</li> <li>• Lane County currently does not have information regarding the worst probable case scenario for a dam failure event. The National Weather Service and EWEB have run dam break inundation studies. Gathering such information for the dams in Lane County would assist the County in knowing the worst probable case scenario and in identifying methods for preparing for and responding to the scenario.</li> </ul>	
<b>Ideas for Implementation:</b>	
<ul style="list-style-type: none"> <li>• Convene a meeting of technical experts to address potential risk associated with seismic vulnerability of Lane County's dams. Possible agencies to invite include: DOGAMI, USGS, USACE, EWEB, and NWS.</li> <li>• Incorporate data into the local GIS system.</li> </ul>	
<b>Coordinating Organization:</b>	<b>Eugene Water and Electric Board – Water/Electric Engineering</b>
<b>Internal Partners:</b>	<b>External Partners:</b>
LCEM EWEB Environmental Dept.	DOGAMI, USACE, NWS, USGS
<b>Timeline:</b>	<b>If available, estimated cost:</b>
<u>Short Term</u> (0-2 years)	<u>Long Term</u> (2-4 or more years)
	5 Years

# Action Item Proposal Form

<b>Proposed Action Item Identification:</b>		
Short Term: Dam Safety Hazard #3		
<b>Proposed Action Title/Description:</b>		
Prepare high resolution maps of dam failure inundation areas and update emergency response plan, including public notification and evacuation routes.		
<b>Rationale for Proposed Action Item:</b>		
<ul style="list-style-type: none"> <li>• Following the events of 2005's Hurricane Katrina, Lane County recognized a need and an opportunity to assess the worst probably case scenario for a dam failure event in Lane County. Preparing maps of dam failure inundation areas can provide the County with information about what to expect from a dam failure event: what areas, infrastructure, populations, etc., would be affected and to what extent. A better understanding of the County's vulnerability to a dam failure event can assist the County in better identifying methods for mitigating the risk of dam vulnerability to hazards.</li> <li>• Lane County currently does not have information regarding the worst probable case scenario for a dam failure event. The National Weather Service has run dam break inundation studies. Eugene Water &amp; Electric has evaluated its dams on the McKenzie River for worst case inundation scenarios. Gathering such information for the dams in Lane County would assist the County in knowing the worst probable case scenario and in identifying methods for preparing for and responding to the scenario.</li> </ul>		
<b>Ideas for Implementation:</b>		
<ul style="list-style-type: none"> <li>• Incorporate action item into Lane County's Emergency Operations Plan.</li> <li>• Obtain EWEB's dam break inundation GIS data that shows wave height, timing of wave, and inundation area as the flood moves down the watershed (using Smith and Trail Bridge dam failures). This data is available as a CADD data layer (which can be converted to GIS).</li> <li>• Obtain NWS dam failure inundation study results for Lane County Dams and work with the Army COE to evaluate validity of these results for Army COE dams. Obtain data as a GIS data layer or digitize information into a GIS format for use with other data layers.</li> <li>• Develop GIS-based evacuation plans and identify shelters with caches of supplies for population potentially effected.</li> </ul>		
<b>Coordinating Organization:</b>	<b>Eugene Water and Electric Board – Water/Electric Engineering</b>	
<b>Internal Partners:</b>	<b>External Partners:</b>	
LCEM, LCPW – GIS EWEB-Environmental Dept	USACE, NWS, USGS	
<b>Timeline:</b>	<b>If available, estimated cost:</b>	
<u>Short Term</u> (0-2 years)	<u>Long Term</u> (2-4 or more years)	\$20,000 - \$40,000
1-2 years		

# Action Item Proposal Form

<b>Proposed Action Item Identification:</b>	
Ongoing: HazMat Safety Hazard #1	
<b>Proposed Action Title/Description:</b>	
Enhance emergency planning, emergency response training and equipment to address hazardous materials incidents.	
<b>Rationale for Proposed Action Item:</b>	
<b>Ideas for Implementation:</b>	
<b>Coordinating Organization:</b>	<b>Regional HazMat Team</b>
<b>Internal Partners:</b>	<b>External Partners:</b>
	FEMA Region X
<b>Timeline:</b>	<b>If available, estimated cost:</b>
Short Term (0-2 years)	
Long Term (2-4 or more years)	
	Ongoing

# Action Item Proposal Form

<b>Proposed Action Item Identification:</b>	
Short Term: HazMat Safety Hazard #2	
<b>Proposed Action Title/Description:</b>	
Ensure that first responders have readily available site-specific knowledge of hazardous chemical inventories in Lane County	
<b>Rationale for Proposed Action Item:</b>	
<b>Ideas for Implementation:</b>	
<b>Coordinating Organization:</b>	Oregon State Fire Marshal
<b>Internal Partners:</b>	<b>External Partners:</b>
<b>Timeline:</b>	<b>If available, estimated cost:</b>
<u>Short Term</u> (0-2 years)	<u>Long Term</u> (2-4 or more years)
1 years	

# Action Item Proposal Form

<b>Proposed Action Item Identification:</b>	
Short Term: HazMat Safety Hazard #3	
<b>Proposed Action Title/Description:</b>	
Plot HazMat locations in GIS for first responders.	
<b>Rationale for Proposed Action Item:</b>	
<b>Ideas for Implementation:</b>	
<b>Coordinating Organization:</b>	Lane County Public Works – GIS
<b>Internal Partners:</b>	<b>External Partners:</b>
<b>Timeline:</b>	<b>If available, estimated cost:</b>
<u>Short Term</u> (0-2 years)	<u>Long Term</u> (2-4 or more years)
6 Months	

# Action Item Proposal Form

<b>Proposed Action Item Identification:</b>	
Ongoing: Terrorism Hazard #1	
<b>Proposed Action Title/Description:</b>	
Enhance emergency planning, emergency response training and equipment to address potential terrorism incidents.	
<b>Rationale for Proposed Action Item:</b>	
<b>Ideas for Implementation:</b>	
<b>Coordinating Organization:</b>	Lane County Emergency Management
<b>Internal Partners:</b>	<b>External Partners:</b>
<b>Timeline:</b>	<b>If available, estimated cost:</b>
Short Term (0-2 years)	Long Term (2-4 or more years)
	Ongoing

# Action Item Proposal Form

<b>Proposed Action Item Identification:</b>	
Long Term: Terrorism Hazard #2	
<b>Proposed Action Title/Description:</b>	
Upgrade physical security detection and response capability for critical facilities, including water systems	
<b>Rationale for Proposed Action Item:</b>	
<b>Ideas for Implementation:</b>	
<b>Coordinating Organization:</b>	Eugene Water and Electric Board
<b>Internal Partners:</b>	<b>External Partners:</b>
<b>Timeline:</b>	<b>If available, estimated cost:</b>
Short Term (0-2 years)	Long Term (2-4 or more years)
	5 Years

# Section 5:

## Plan Implementation and Maintenance

### Overview

The plan implementation and maintenance section of this document details the formal process that is designed to ensure that the Lane County Natural Hazards Mitigation Plan (NHMP) remains an active and relevant document. This section provides the foundation for the Lane County Disaster Policy Council and outlines how the Council will prioritize projects for reducing the county's risk to natural hazards.

This section also includes a schedule for maintaining and updating the plan. The plan maintenance process includes a schedule for monitoring and evaluating the Plan annually and producing an updated plan every five years. This section includes an explanation of how Lane County intends to incorporate the mitigation strategies outlined in this Plan into existing planning mechanisms and programs such as the Lane County comprehensive land use planning process, capital improvement planning process, and building codes enforcement and implementation. This section also describes how Lane County will integrate public participation in the plan maintenance and implementation process.

It is critical that Lane County have a "living document" and not a plan that will simply sit on a shelf and gather dust. The plan's format allows Lane County to review and update sections as new data becomes available. New data can be incorporated, resulting in a natural hazards mitigation plan that remains current and relevant to Lane County. The benefits of a current and relevant natural hazard mitigation plan include:

- Keeping the public informed of and involved in the County's natural hazard mitigation efforts;
- Building community partnerships and collaboration between local/state/federal governments, local businesses, and private landowners;
- Identifying a variety of funding sources and opportunities available to the county; and
- Protecting lives, property, and critical resources from natural hazards.

### Plan Implementation

The Lane County Natural Hazards Mitigation Plan was developed and will be implemented through a collaborative process. After the Plan is

adopted via resolution by the Lane County Board of Commissioners, Lane County Emergency Management will be responsible for submitting it to the State Hazard Mitigation Officer at Oregon Emergency Management. Oregon Emergency Management will then submit the Plan to the Federal Emergency Management Agency (FEMA – Region X) for review. This review will address the federal criteria outlined in FEMA Interim Final Rule 44 CFR Part 201. Upon acceptance by FEMA, Lane County will gain eligibility for the Pre-Disaster Mitigation Grant Program, as well as the Hazard Mitigation Grant Program and Flood Mitigation Assistance program funds.

After the Plan is adopted, the plan development Steering Committee will remain intact and become the Lane County Disaster Policy Council. The Disaster Policy Council will be responsible for addressing all disasters faced by Lane County, and will focus its efforts on implementing the Natural Hazards Mitigation Plan through the identified action items.

The Steering Committee identified a range of action items that, if implemented, will assist the County in reaching the Plan's established goals and would reduce loss from hazard events in Lane County. The effectiveness of Lane County's non-regulatory Natural Hazards Mitigation Plan will be contingent upon the implementation of the plan and incorporation of the identified action items into existing Lane County plans, policies, and programs.

## **Co-Conveners**

Lane County Emergency Management and the Lane County Land Management Division will serve as co-conveners to oversee the plan's implementation and maintenance. They will co-chair the Disaster Policy Council and fulfill the chair's responsibilities. These two entities will be responsible for calling meetings to order at scheduled times or when issues arise, (e.g., when funding becomes available or following a major natural hazard event).

Emergency Management roles:

- Coordinate Disaster Policy Council meeting dates, times, locations, agendas, and member notification;
- Document outcomes of Committee meetings;
- Serve as a communication conduit between the Disaster Policy Council and key plan stakeholders; and
- Identify emergency management-related funding sources for natural hazard mitigation projects.

Land Management roles:

- Serve as gatekeeper to the project prioritization process;

- Incorporate, maintain, and update Lane County’s natural hazards risk GIS data elements; and
- Utilize the Lane County Natural Hazards Risk Assessment as a tool for prioritizing proposed natural hazard risk reduction projects.

## **Coordinating Body**

In accordance with Multi-Hazard action item #1, the plan development steering committee will become the Disaster Policy Council and will: oversee implementation, identify and coordinate funding opportunities and sustain the Natural Hazards Mitigation Plan. The Disaster Policy Council will act as the coordinating body and serve as a centralized resource for natural hazard issues and risk reduction in Lane County. Additional roles and responsibilities of the committee include:

- Serving as the local evaluation committee for funding programs such as the Pre-Disaster Mitigation Grant Program, the Hazard Mitigation Grant Program funds, and Flood Mitigation Assistance program funds;
- Prioritizing and recommending funding for natural hazard risk reduction projects;
- Documenting successes and lessons learned;
- Evaluating and updating the Natural Hazards Mitigation Plan in accordance with the prescribed maintenance schedule, (See Table 5.1); and
- Developing and coordinating ad hoc and/or standing subcommittees as needed.

## **Members**

The following organizations were represented and served on the Steering Committee during the development of the Lane County Natural Hazards Mitigation Plan. These groups will continue to be members of the Disaster Policy Council in the implementation and maintenance phases of the natural hazards mitigation plan.

- Lane County Emergency Management
- Lane County Land Management Division
- Oregon Department of Forestry – East Lane and South Cascade Districts
- Lane County Public Works, GIS and Roads Units
- United States Forest Service
- Bureau of Land Management

- Eugene Water and Electric Board
- Springfield Utility Board

Because of the importance that the planning process places on collaboration and the fact that natural hazards mitigation is a shared responsibility among a number of diverse stakeholders, the Disaster Policy Council may look to expand the current membership, as needed. More and more, competitive funding sources are using collaboration as an evaluation criterion for scoring potential projects. Having a more diverse Council will help County projects score higher on competitive grants. Potential future committee members may include:

- Budget/Finance Office;
- Building Code Enforcement Office;
- Colleges/Universities;
- County Assessor's Office;
- Home Builders Association;
- Home Owners Association;
- Insurance representatives;
- Land Developers;
- Local elected officials;
- Professional Engineering/Planning Firms;
- Sanitation & Water District;
- School District or School Board Representative;
- Siuslaw, Long Tom, McKenzie, Coast Fork Willamette and Middle Fork Willamette Watershed Councils;
- Local service organizations (American Red Cross, Salvation Army, United Way); and
- United States Army Corps of Engineers.

## **Implementing through Existing Programs**

The Natural Hazards Mitigation Plan includes a range of action items that, when implemented, will reduce loss from hazard events in Lane County. Lane County's Capital Improvement Program, 1980 Parks and Open Space Plan, Rural Comprehensive Plan, Transportation System Plan, Storm Water Management Plan, and building and construction codes all influence the development and land-use practices within the county. These plans, programs, and codes also help Lane County meet the requirements of Oregon's Statewide Planning Goals and the

requirements of FEMA's Local Hazard Mitigation Planning process. Furthermore, Lane County has a Strategic Plan and a General Plan that assist the County in planning for development and land-use, and providing services to its residents. The effectiveness of the implementation of these two plans influences the effectiveness of the county's plans and policies that influence development and land-use.

Lane County's Natural Hazard Mitigation Plan, though non-regulatory in nature, provides recommended actions that the county can take to reduce its risk of losses from natural hazards such as earthquakes, floods, landslides, wildfire, and winter storms. Many of the Natural Hazards Mitigation Plan's recommendations are consistent with the goals and objectives of the county's existing plans and policies. Where possible, Lane County should implement the Natural Hazards Mitigation Plan's recommended actions through existing plans and policies that already enjoy the support of local residents, businesses, and policy makers. Many land-use, comprehensive, and strategic plans get updated regularly, and can adapt easily to changing conditions and needs.<sup>1</sup> Implementing the natural hazards mitigation plan's action items through such plans and policies increases their likelihood of being supported and getting updated to remain current, and maximizes the county's resources.

Examples of action items from the Natural Hazards Mitigation Plan that could be implemented through Lane County's existing plans and policies include the following:

- **Multi-Hazard Action Item #1:** Create and formalize a Lane County Disaster Policy Council to oversee implementation, identify and coordinate funding opportunities, and sustain the Lane County Natural Hazards Mitigation Plan (including the CWPP) and the Emergency Operations Plan, as a single integrated effort.

This action item could be implemented through Lane County's Strategic Plan.

- **Flood Hazard Action Item #4:** Complete an inventory of locations in Lane County subject to frequent storm water flooding.

This action item could be implemented through Lane County's Storm Water Management Plan.

- **Flood Hazard Action Item #5:** For locations with repetitive flooding and significant damages or road closures, determine and implement mitigation measures such as upsizing culverts, or storm water drainage ditches.

This action item could be implemented through Lane County's Capital Improvement Program.

- **Winter Storm Hazard #8:** Develop a hazardous tree inventory for all County properties.

This action item could be implemented through Lane County’s 1980 Parks and Open Space Plan.

See Appendix B: *Existing Plans Policies, and Programs in Lane County* for documentation of existing plans, policies, and programs that can be used to implement mitigation activities.

## Plan Maintenance

Plan maintenance is a critical component of the natural hazards mitigation plan. Proper maintenance will ensure that this plan benefits Lane County’s efforts to reduce the risks posed by natural hazards. This section was developed by the University of Oregon’s Oregon Natural Hazards Workgroup and presents a process to ensure that a regular review and updating of the plan occurs. The Disaster Policy Council and local staff will be responsible for implementing this process as well as maintaining and updating the plan through a series of meetings outlined in the maintenance schedule below.

**Table 5.1: Plan Maintenance Meeting Schedule**

<b>Semi-Annual Meeting</b>	<b>Annual Meeting</b>	<b>Five-Year Review</b>
Review Current Actions	Update Risk Assessment Data and Findings based upon new data	Review plan update questions
Identify New Issues and Needs	Discussion of Methods of Continued Public Involvement	Update plan sections as necessary
Prioritize Potential Projects	Documenting Successes and Lessons Learned	

### Semi-Annual Meeting

The Disaster Policy Council will meet on a semi-annual basis to:

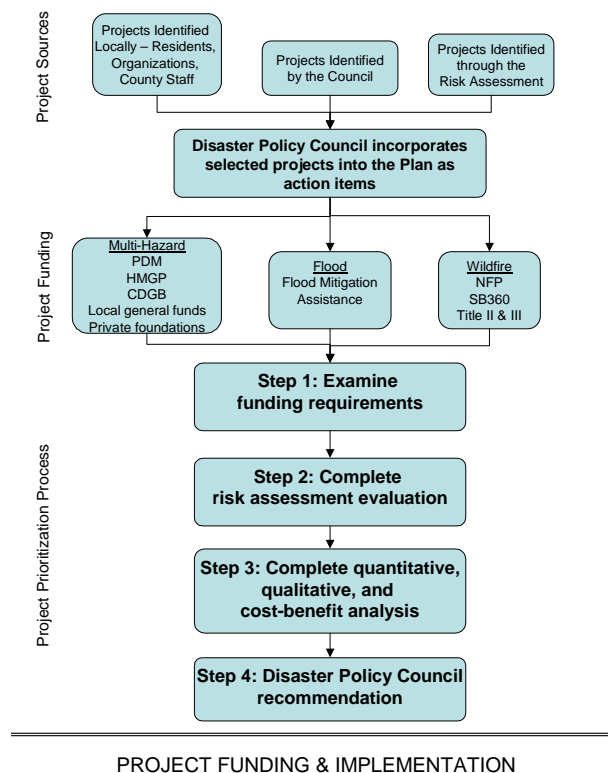
- Review existing action items to determine appropriateness for funding;
- Identify issues that may not have been evident when the plan was developed; and
- Prioritize potential mitigation projects using the methodology described below.

The co-conveners will be responsible for documenting the outcome of the semi-annual meetings. The process the Disaster Policy Council will use to prioritize mitigation projects is detailed in the section below.

## Project Prioritization Process

The requirements of the Disaster Mitigation Act of 2000 state that the plan must identify a process for prioritizing potential actions. Potential mitigation activities often come from a variety of sources; therefore, the project prioritization process needs to be flexible. Examples of the means by which projects may be identified include: Disaster Policy Council members, local government staff, other planning documents, or the Risk Assessment. The Disaster Policy Council will consider all proposed projects and select the ones that align with the Plan's goals, and incorporate them into the plan as formal action items. Funding can then be considered for projects that have been formally incorporated into the Plan. Depending on the potential project's intent and implementation methods, several funding sources may be appropriate. Examples of mitigation funding sources include, but are not limited to: FEMA's Pre-Disaster Mitigation competitive grant program (PDM), the Flood Mitigation Assistance (FMA) program, the National Fire Plan (NFP), Title II funds, Title III funds, Community Development Block Grants (CDBG), local general funds, and private foundations, among others. Some of these examples are used in the figure below to illustrate the project prioritization process, which utilizes a four step method to prioritize activities and ensure that mitigation dollars are used in a cost-effective manner.

Figure 5.1: Project Prioritization Process Overview



Source: Community Service Center's Oregon Natural Hazards Workgroup at the University of Oregon, 2005

## **Step 1: Examine Funding Requirements**

The Disaster Policy Council will examine the selected funding stream's requirements to ensure that the mitigation activity is eligible through the funding source. The Disaster Policy Council may consult with the funding entity, Oregon Emergency Management, or other appropriate state or regional organization about the project's eligibility.

## **Step 2: Complete Risk Assessment Evaluation**

The second step in prioritizing the plan's action items is to examine which hazards would be addressed and where these hazards rank in terms of community risk. The Disaster Policy Council will determine whether or not the plan's Risk Assessment supports the implementation of the mitigation activity. This determination will be based on the location of the potential activity and the proximity to known hazard areas, historic hazard occurrence, and the probability of future occurrence documented in the plan. To rank the hazards, the community's natural hazard risk assessment was utilized. This risk assessment identified various hazards that may threaten community facilities and are categorized as either: low, average, or high.

Ranking of hazards by risk follows:

1. Windstorm – Risk score of 190 out of 240
2. Wildfire – Risk score of 180 out of 240
3. Earthquake – Risk score of 175 out of 240
4. Landslide – Risk score of 171 out of 240
5. Flood – Risk score of 165 out of 240

## **Step 3: Complete Quantitative, Qualitative Assessment, and Economic Analysis**

Depending on the type of project and the funding source, either a quantitative or qualitative assessment of cost effectiveness will be completed to assist in prioritizing potential actions. Conducting benefit/cost analysis for a mitigation activity can assist communities in determining whether a project is worth undertaking immediately, in order to avoid future disaster-related damages. Cost-effectiveness analysis evaluates how best to spend a given amount of money to achieve a specific goal. Determining the economic feasibility of mitigating natural hazards provides decision-makers with an understanding of the potential benefits and costs of an activity, as well as a basis upon which to compare alternative projects.

If the activity is seeking federal funding for a structural project, the Disaster Policy Council will use a FEMA-approved cost-benefit analysis tool to evaluate the appropriateness of the activity. See *Appendix A: Economic Analysis of Natural Hazard Mitigation Projects* for a description of the FEMA-approved cost-benefit analysis. A project must

have a benefit cost ratio of greater than 1 in order to be eligible for FEMA funding.

For FEMA-funded non-structural projects, or projects funded through entities other than FEMA, a qualitative assessment will be completed to determine the project's cost effectiveness. The Disaster Policy Council will use a multi-variable assessment technique called STAPLE/E to prioritize the actions. STAPLE/E stands for Social, Technical, Administrative, Political, Legal, Economic, and Environmental. Assessing projects based upon these seven variables can help define a project's qualitative cost effectiveness.

The STAPLE/E technique has been tailored for natural hazard action item prioritization by the University of Oregon's Oregon Natural Hazards Workgroup. See *Appendix A: Economic Analysis of Natural Hazard Mitigation Projects* for a description of the STAPLE/E evaluation methodology.

#### **Step 4: Council Recommendation**

Based on the steps above, the Disaster Policy Council will recommend whether or not the mitigation activity should be moved forward. If the Disaster Policy Council decides to proceed with the action, the coordinating organization designated for the activity will be responsible for taking further action and documenting success upon project completion. The Disaster Policy Council co-conveners will call a meeting to review the issues surrounding grant applications and provide council members the opportunity to share knowledge and resources. This process will afford greater coordination and assist the County in maximizing limited funds.

The Disaster Policy Council and the community's leadership have the option to implement any of the action items at any time (regardless of the prioritized order). This allows the Disaster Policy Council to consider mitigation strategies as new opportunities arise, such as funding for action items that may not be of the highest priority. This methodology used by the Disaster Policy Council to initially prioritize the plan's action items will also be used to maintain the action list during annual review and update.

Dam Safety Action Item #2 is an example of an action item that the County may wish to implement immediately. This action recommends working with the U.S. Army Corps of Engineers to complete seismic vulnerability assessments for dams upstream of heavily populated areas in Lane County and to make seismic improvements as necessary. Dam safety is ranked as one of Lane County's secondary hazards: a hazard that can affect the county but has a lesser probability of occurrence than the primary hazards. However, in light of heightened public awareness following the events of Hurricane Katrina, Lane County has placed a high level of priority on addressing this issue.

## Annual Meeting

The Disaster Policy Council will meet annually to review updates of the Risk Assessment data and findings, discuss methods of continued public involvement, and document successes and lessons learned based on actions that were accomplished during the past year. The co-conveners will be responsible for documenting the outcomes of the annual meeting.

## Five-Year Review of Plan

This plan will be updated every five years in accordance with the update schedule outlined in the Disaster Mitigation Act of 2000. During this plan update, the following questions should be asked to determine what actions are necessary to update the plan. The co-conveners will be responsible for convening the Disaster Policy Council to address the questions outlined below.

- Are the plan goals still applicable?
- Do the plan's priorities align with State priorities?
- Are there new partners that should be brought to the table?
- Are there new local, regional, state, or federal policies influencing natural hazards that should be addressed?
- Has the community successfully implemented any mitigation activities since the plan was last updated?
- Have new issues or problems related to hazards been identified in the community?
- Do existing actions need to be reprioritized for implementation?
- Are the actions still appropriate, given current resources?
- Have there been any changes in development patterns that could influence the effects of hazards?
- Have there been any significant changes in the community's demographics that could influence the effects of hazards?
- Are there new studies or data available that would enhance the risk assessment? (See

Oregon's Statewide Planning Goal 7 – *Response to New Hazard Information*: **STEP 1** New hazard inventory information provided by federal and state agencies shall be reviewed by the Department in consultation with affected state and local government representatives; **STEP 2** After such consultation, the Department shall notify local governments if the new hazard information requires a local response; and **STEP 3** Local governments shall respond to new inventory information on natural hazards within 36 months after being notified by the Department of Land Conservation and Development, unless extended by the Department.

sidebar for additional information)

- Has the community been affected by any disasters? Did the plan accurately address the impacts of this event?

The questions above will help the Disaster Policy Council determine what components of the mitigation plan need updating, and, based on the answers, Council will be responsible for updating any deficiencies found in the plan.

## Continued Public Involvement

Lane County is committed to directly involving the public in the review and updates of the Natural Hazard Mitigation Plan. The Disaster Policy Council, the body responsible for maintaining and implementing the Plan, represents the public to some extent, however, the public will also have the opportunity to provide input and feedback about the Plan.

A copy of the Plan will be made available to the public at the offices of Lane County Emergency Management. In addition, access to the Plan and notices of all updates and changes will be maintained on the Lane County website, which will also provide an e-mail address and phone number that the public can use to submit comments and questions about the Plan.

A public forum will also be incorporated into the Disaster Policy Council's annual review meeting of the Plan. Public notice will be given, informing the public of a community forum that will follow the annual review meeting. The purpose of the public forum will be to invite the public to share concerns, comments, and ideas about the Plan with the Disaster Policy Council

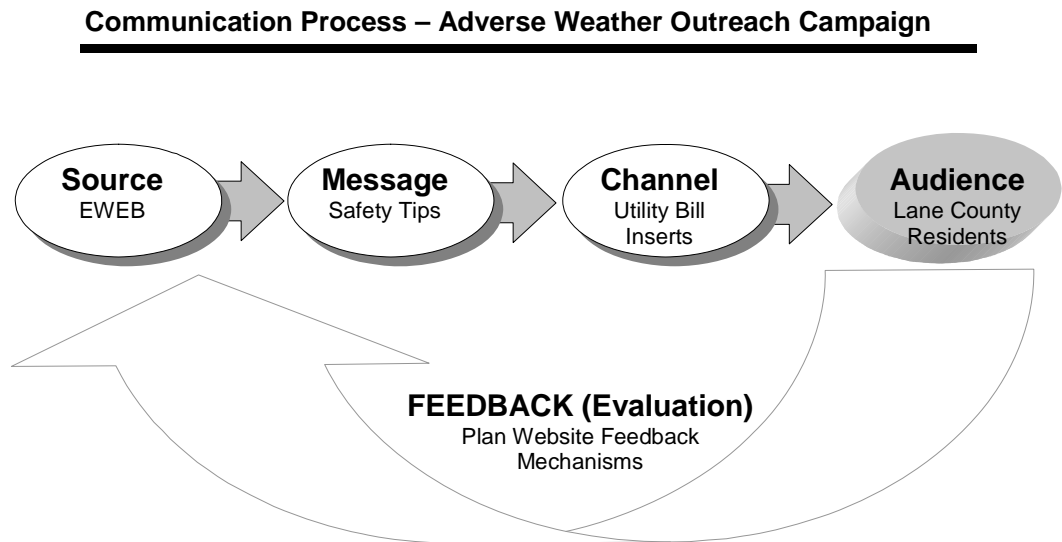
The Disaster Policy Council will also engage in various outreach campaigns in an effort to make the public aware of the risks hazards pose and the efforts the County and its partners are making to reduce overall risk in the County. The Disaster Policy Council will use a commonly accepted communication process to implement these outreach strategies. The communication process is described below, using Winter Storm Action Item #5 as an example.

There are five essential elements for communicating effectively to a target audience. These five features are graphically presented in **Figure 5.2**:

- The **source** of the message must be credible,
- The **message** must be appropriately designed,
- The **channel** for communicating the message must be carefully selected,
- The **audience** must be clearly defined, and

The recommended action must be clearly stated and a **feedback** channel established for questions, comments and suggestions.

**Figure 5.2 Communication Process**



Source: Adapted from the U.S. Environmental Protection Agency Radon Division's outreach program

The winter storm action item calls for the implementation of a public outreach campaign to remind people how to get around under adverse weather conditions. The Lane County Public Works Roads Division has been identified as the coordinating organization for this action. A potential credible *source* might be the Eugene Water and Electrical Board or other utility providers; the message could include safety tips on driving in adverse conditions and key contacts for current weather and driving conditions; and distribution could be in the form of an utility bill inserts (the channel). The target audience of the campaign would be residents and utilizing utility bill inserts allows the County to reach residents, including both homeowners and renters - a large portion of the County's population. The utility inserts could include a link to the County's mitigation plan on-line so that residents can provide feedback.

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<sup>1</sup> Burby, Raymond J., ed. 1998. *Cooperating with Nature: Confronting Natural Hazards with Land-Use Planning for Sustainable Communities*.

# Appendix A

## Economic Analysis of Natural Hazard Mitigation Projects

This appendix was developed by the University of Oregon's Oregon Natural Hazards Workgroup and it outlines three approaches for conducting economic analyses of natural hazard mitigation projects. It describes the importance of implementing mitigation activities, different approaches to economic analysis of mitigation strategies, and methods to calculate costs and benefits associated with mitigation strategies. Information in this section is derived in part from: The Interagency Hazards Mitigation Team, *State Hazard Mitigation Plan*, (Oregon State Police – Office of Emergency Management, 2000), and Federal Emergency Management Agency Publication 331, *Report on Costs and Benefits of Natural Hazard Mitigation*. This section is not intended to provide a comprehensive description of benefit/cost analysis, nor is it intended to provide the details of economic analysis methods that can be used to evaluate local projects. It is intended to (1) raise benefit/cost analysis as an important issue, and (2) provide some background on how economic analysis can be used to evaluate mitigation projects.

### Why Evaluate Mitigation Strategies?

Mitigation activities reduce the cost of disasters by minimizing property damage, injuries, and the potential for loss of life, and by reducing emergency response costs, which would otherwise be incurred. Evaluating possible natural hazard mitigation activities provides decision-makers with an understanding of the potential benefits and costs of an activity, as well as a basis upon which to compare alternative projects.

Evaluating mitigation projects is a complex and difficult undertaking, which is influenced by many variables. First, natural disasters affect all segments of the communities they strike, including individuals, businesses, and public services such as fire, police, utilities, and schools. Second, while some of the direct and indirect costs of disaster damages are measurable, some of the costs are non-financial and difficult to quantify in dollars. Third, many of the impacts of such events produce “ripple-effects” throughout the community, greatly increasing the disaster’s social and economic consequences.

While not easily accomplished, there is value, from a public policy perspective, in assessing the positive and negative impacts from mitigation activities, and obtaining an instructive benefit/cost comparison. Otherwise, the decision to pursue or not pursue various

mitigation options would not be based on an objective understanding of the net benefit or loss associated with these actions.

## **What are Some Economic Analysis Approaches for Evaluating Mitigation Strategies?**

The approaches used to identify the costs and benefits associated with natural hazard mitigation strategies, measures, or projects fall into three general categories: benefit/cost analysis, cost-effectiveness analysis and the STAPLE/E approach. The distinction between the there methods is outlined below:

### **Benefit/cost Analysis**

Benefit/cost analysis is a key mechanism used by the state Office of Emergency Management (OEM), the Federal Emergency Management Agency, and other state and federal agencies in evaluating hazard mitigation projects, and is required by the Robert T. Stafford Disaster Relief and Emergency Assistance Act, Public Law 93-288, as amended.

Benefit/cost analysis is used in natural hazards mitigation to show if the benefits to life and property protected through mitigation efforts exceed the cost of the mitigation activity. Conducting benefit/cost analysis for a mitigation activity can assist communities in determining whether a project is worth undertaking now, in order to avoid disaster-related damages later. Benefit/cost analysis is based on calculating the frequency and severity of a hazard, avoided future damages, and risk. In benefit/cost analysis, all costs and benefits are evaluated in terms of dollars, and a net benefit/cost ratio is computed to determine whether a project should be implemented. A project must have a benefit/cost ratio greater than 1 (i.e., the net benefits will exceed the net costs) to be eligible for FEMA funding.

### **Cost-Effectiveness Analysis**

Cost-effectiveness analysis evaluates how best to spend a given amount of money to achieve a specific goal. This type of analysis, however, does not necessarily measure costs and benefits in terms of dollars. Determining the economic feasibility of mitigating natural hazards can also be organized according to the perspective of those with an economic interest in the outcome. Hence, economic analysis approaches are covered for both public and private sectors as follows.

#### **Investing in public sector mitigation activities**

Evaluating mitigation strategies in the public sector is complicated because it involves estimating all of the economic benefits and costs regardless of who realizes them, and potentially to a large number of people and economic entities. Some benefits cannot be evaluated monetarily, but still affect the public in profound ways. Economists have developed methods to evaluate the economic feasibility of public decisions which involve a diverse set of beneficiaries and non-market benefits.

## Investing in private sector mitigation activities

Private sector mitigation projects may occur on the basis of one of two approaches: it may be mandated by a regulation or standard, or it may be economically justified on its own merits. A building or landowner, whether a private entity or a public agency, required to conform to a mandated standard may consider the following options:

1. Request cost sharing from public agencies;
2. Dispose of the building or land either by sale or demolition;
3. Change the designated use of the building or land and change the hazard mitigation compliance requirement; or
4. Evaluate the most feasible alternatives and initiate the most cost effective hazard mitigation alternative.

The sale of a building or land triggers another set of concerns. For example, real estate disclosure laws can be developed which require sellers of real property to disclose known defects and deficiencies in the property, including earthquake weaknesses and hazards to prospective purchasers. Correcting deficiencies can be expensive and time consuming, but their existence can prevent the sale of the building. Conditions of a sale regarding the deficiencies and the price of the building can be negotiated between a buyer and seller.

## STAPLE/E Approach

Conducting detailed benefit/cost or cost-effectiveness analysis for every possible mitigation activity could be very time consuming and may not be practical. There are some alternate approaches for conducting a quick evaluation of the proposed mitigation activities which could be used to identify those mitigation activities that merit more detailed assessment. One of these methods is the STAPLE/E Approach.

Using STAPLE/E criteria, mitigation activities can be evaluated quickly by steering committees in a systematic fashion. This criteria requires the committee to assess the mitigation activities based on the Social, Technical, Administrative, Political, Legal, Economic, and Environmental (STAPLE/E) constraints and opportunities of implementing the particular mitigation item in your community. The second chapter in FEMA's How-To Guide "Developing the Mitigation Plan – Identifying Mitigation Actions and Implementation Strategies" as well as the "State of Oregon's Local Natural Hazard Mitigation Plan: An Evaluation Process" outline some specific considerations in analyzing each aspect. The following are suggestions for how to examine each aspect of the STAPLE/E Approach from the "State of Oregon's Local Natural Hazard Mitigation Plan: An Evaluation Process".

**Social:** Community development staff, local non-profit organizations, or a local planning board can help answer these questions.

- Is the proposed action socially acceptable to the community?
- Are there equity issues involved that would mean that one segment of the community is treated unfairly?
- Will the action cause social disruption?

**Technical:** The city or county public works staff, and building department staff can help answer these questions.

- Will the proposed action work?
- Will it create more problems than it solves?
- Does it solve a problem or only a symptom?
- Is it the most useful action in light of other community goals?

**Administrative:** Elected officials or the city or county administrator, can help answer these questions.

- Can the community implement the action?
- Is there someone to coordinate and lead the effort?
- Is there sufficient funding, staff, and technical support available?
- Are there ongoing administrative requirements that need to be met?

**Political:** Consult the mayor, city council or county planning commission, city or county administrator, and local planning commissions to help answer these questions.

- Is the action politically acceptable?
- Is there public support both to implement and to maintain the project?

**Legal:** Include legal counsel, land use planners, risk managers, and city council or county planning commission members, among others, in this discussion.

- Is the community authorized to implement the proposed action? Is there a clear legal basis or precedent for this activity?
- Are there legal side effects? Could the activity be construed as a taking?
- Is the proposed action allowed by the comprehensive plan, or must the comprehensive plan be amended to allow the proposed action?
- Will the community be liable for action or lack of action?
- Will the activity be challenged?

**Economic:** Community economic development staff, civil engineers, building department staff, and the assessor's office can help answer these questions.

- What are the costs and benefits of this action?
- Do the benefits exceed the costs?
- Are initial, maintenance, and administrative costs taken into account?
- Has funding been secured for the proposed action? If not, what are the potential funding sources (public, non-profit, and private)?
- How will this action affect the fiscal capability of the community?
- What burden will this action place on the tax base or local economy?
- What are the budget and revenue effects of this activity?
- Does the action contribute to other community goals, such as capital improvements or economic development?
- What benefits will the action provide? (This can include dollar amount of damages prevented, number of homes protected, credit under the CRS, potential for funding under the HMGP or the FMA program, etc.)

**Environmental:** Watershed councils, environmental groups, land use planners and natural resource managers can help answer these questions.

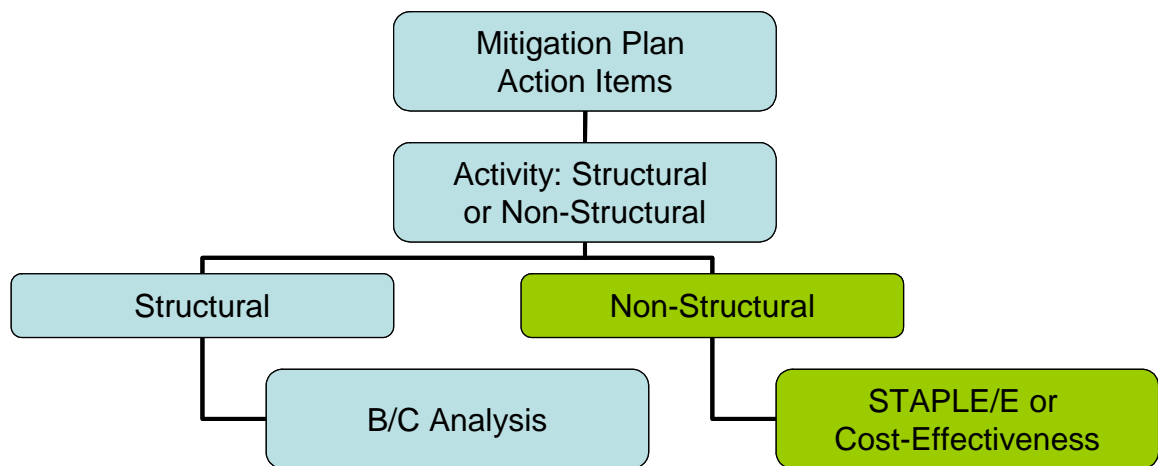
- How will the action impact the environment?
- Will the action need environmental regulatory approvals?
- Will it meet local and state regulatory requirements?
- Are endangered or threatened species likely to be affected?

The STAPLE/E approach is helpful for doing a quick analysis of mitigation projects. Most projects that seek federal funding and others often require more detailed Benefit/Cost Analyses.

## **When to use the Various Approaches**

It is important to realize that various funding sources require different types of economic analyses. The following figure is to serve as a guideline for when to use the various approaches.

**Figure A.1: Economic Analysis Flowchart**



Source: Community Service Center's Oregon Natural Hazards Workgroup at the University of Oregon, 2005

## Implementing the Approaches

Benefit/cost analysis, cost-effectiveness analysis, and the STAPLE/E are important tools in evaluating whether or not to implement a mitigation activity. A framework for evaluating mitigation activities is outlined below. This framework should be used in further analyzing the feasibility of prioritized mitigation activities.

### 1. Identify the Activities

Activities for reducing risk from natural hazards can include structural projects to enhance disaster resistance, education and outreach, and acquisition or demolition of exposed properties, among others. Different mitigation project can assist in minimizing risk to natural hazards, but do so at varying economic costs.

### 2. Calculate the Costs and Benefits

Choosing economic criteria is essential to systematically calculating costs and benefits of mitigation projects and selecting the most appropriate activities. Potential economic criteria to evaluate alternatives include:

- ***Determine the project cost.*** This may include initial project development costs, and repair and operating costs of maintaining projects over time.
- ***Estimate the benefits.*** Projecting the benefits, or cash flow resulting from a project can be difficult. Expected future returns from the mitigation effort depend on the correct specification of the risk and the effectiveness of the project, which may not be

well known. Expected future costs depend on the physical durability and potential economic obsolescence of the investment. This is difficult to project. These considerations will also provide guidance in selecting an appropriate salvage value. Future tax structures and rates must be projected. Financing alternatives must be researched, and they may include retained earnings, bond and stock issues, and commercial loans.

- ***Consider costs and benefits to society and the environment.*** These are not easily measured, but can be assessed through a variety of economic tools including existence value or contingent value theories. These theories provide quantitative data on the value people attribute to physical or social environments. Even without hard data, however, impacts of structural projects to the physical environment or to society should be considered when implementing mitigation projects.
- ***Determine the correct discount rate.*** Determination of the discount rate can just be the risk-free cost of capital, but it may include the decision maker's time preference and also a risk premium. Including inflation should also be considered.

### **3. Analyze and Rank the Activities**

Once costs and benefits have been quantified, economic analysis tools can rank the possible mitigation activities. Two methods for determining the best activities given varying costs and benefits include net present value and internal rate of return.

- ***Net present value.*** Net present value is the value of the expected future returns of an investment minus the value of expected future cost expressed in today's dollars. If the net present value is greater than the project costs, the project may be determined feasible for implementation. Selecting the discount rate, and identifying the present and future costs and benefits of the project calculates the net present value of projects.
- ***Internal Rate of Return.*** Using the *internal rate of return* method to evaluate mitigation projects provides the interest rate equivalent to the dollar returns expected from the project. Once the rate has been calculated, it can be compared to rates earned by investing in alternative projects. Projects may be feasible to implement when the internal rate of return is greater than the total costs of the project. Once the mitigation projects are ranked on the basis of economic criteria, decision-makers can consider other factors, such as risk, project effectiveness, and economic, environmental, and social returns in choosing the appropriate project for implementation.

## **Economic Returns of Natural Hazard Mitigation**

The estimation of economic returns, which accrue to building or land owners as a result of natural hazard mitigation, is difficult. Owners evaluating the economic feasibility of mitigation should consider reductions in physical damages and financial losses. A partial list follows:

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

These parameters can be estimated using observed prices, costs, and engineering data. The difficult part is to correctly determine the effectiveness of the hazard mitigation project and the resulting reduction in damages and losses. Equally as difficult is assessing the probability that an event will occur. The damages and losses should only include those that will be borne by the owner. The salvage value of the investment can be important in determining economic feasibility. Salvage value becomes more important as the time horizon of the owner declines. This is important because most businesses depreciate assets over a period of time.

## **Additional Costs from Natural Hazards**

Property owners should also assess changes in a broader set of factors that can change as a result of a large natural disaster. These are usually termed "indirect" effects, but they can have a very direct effect on the economic value of the owner's building or land. They can be positive or negative, and include changes in the following:

- Commodity and resource prices
- Availability of resource supplies
- Commodity and resource demand changes
- Building and land values
- Capital availability and interest rates
- Availability of labor
- Economic structure
- Infrastructure
- Regional exports and imports
- Local, state, and national regulations and policies

- Insurance availability and rates

Changes in the resources and industries listed above are more difficult to estimate and require models that are structured to estimate total economic impacts. Total economic impacts are the sum of direct and indirect economic impacts. Total economic impact models are usually not combined with economic feasibility models. Many models exist to estimate total economic impacts of changes in an economy. Decision makers should understand the total economic impacts of natural disasters in order to calculate the benefits of a mitigation activity. This suggests that understanding the local economy is an important first step in being able to understand the potential impacts of a disaster, and the benefits of mitigation activities.

## **Additional Considerations**

Conducting an economic analysis for potential mitigation activities can assist decision-makers in choosing the most appropriate strategy for their community to reduce risk and prevent loss from natural hazards. Economic analysis can also save time and resources from being spent on inappropriate or unfeasible projects. Several resources and models are listed on the following page that can assist in conducting an economic analysis for natural hazard mitigation activities.

Benefit/cost analysis is complicated, and the numbers may divert attention from other important issues. It is important to consider the qualitative factors of a project associated with mitigation that cannot be evaluated economically. There are alternative approaches to implementing mitigation projects. Many communities are looking towards developing multi-objective projects. With this in mind, opportunity rises to develop strategies that integrate natural hazard mitigation with projects related to watersheds, environmental planning, community economic development, and small business development, among others. Incorporating natural hazard mitigation with other community projects can increase the viability of project implementation.

## **Resources**

CUREe Kajima Project, *Methodologies For Evaluating The Socio-Economic Consequences Of Large Earthquakes*, Task 7.2 Economic Impact Analysis, Prepared by University of California, Berkeley Team, Robert A. Olson, VSP Associates, Team Leader; John M. Eidinger, G&E Engineering Systems; Kenneth A. Goettel, Goettel and Associates Inc.; and Gerald L. Horner, Hazard Mitigation Economics Inc., 1997.

Federal Emergency Management Agency, *Benefit/Cost Analysis of Hazard Mitigation Projects*, Riverine Flood, Version 1.05, Hazard Mitigation Economics Inc., 1996.

Federal Emergency Management Agency *Report on Costs and Benefits of Natural Hazard Mitigation*. Publication 331, 1996.

Goettel & Horner Inc., *Earthquake Risk Analysis Volume III: The Economic Feasibility of Seismic Rehabilitation of Buildings in The City of Portland*, Submitted to the Bureau of Buildings, City of Portland, August 30, 1995.

Goettel & Horner Inc., *Benefit/Cost Analysis of Hazard Mitigation Projects Volume V, Earthquakes*, Prepared for FEMA's Hazard Mitigation Branch, October 25, 1995.

Horner, Gerald, *Benefit/Cost Methodologies for Use in Evaluating the Cost Effectiveness of Proposed Hazard Mitigation Measures*, Robert Olson Associates, Prepared for Oregon State Police, Office of Emergency Management, July 1999.

Interagency Hazards Mitigation Team, *State Hazard Mitigation Plan*, (Oregon State Police – Office of Emergency Management, 2000).

Risk Management Solutions, Inc., *Development of a Standardized Earthquake Loss Estimation Methodology*, National Institute of Building Sciences, Volume I and II, 1994.

VSP Associates, Inc., *A Benefit/Cost Model for the Seismic Rehabilitation of Buildings*, Volumes 1 & 2, Federal Emergency Management Agency, FEMA Publication Numbers 227 and 228, 1991.

VSP Associates, Inc., *Benefit/Cost Analysis of Hazard Mitigation Projects: Section 404 Hazard Mitigation Program and Section 406 Public Assistance Program, Volume 3: Seismic Hazard Mitigation Projects*, 1993.

VSP Associates, Inc., *Seismic Rehabilitation of Federal Buildings: A Benefit/Cost Model*, Volume 1, Federal Emergency Management Agency, FEMA Publication Number 255, 1994.

# Appendix B

## Existing Plans, Policies, and Programs In Lane County

The Natural Hazards Mitigation Plan includes a range of recommended action items that, when implemented, will reduce loss from hazard events in Lane County. Many of the recommendations are consistent with the goals and objectives of the county's existing plans and policies. Linking existing plans and policies to the Natural Hazards Mitigation Plan helps identify what resources already exist that can be used to implement the action items. Plans and policies already in existence have support from local residents, businesses, and policy makers. Many land-use, comprehensive, and strategic plans get updated regularly, and can adapt easily to changing conditions and needs.<sup>1</sup> Implementing the natural hazards mitigation plan's action items through existing plans and policies maximizes the county's resources.

The following is a summary of existing Lane County plans, policies, and programs that can be used to implement action items identified in a mitigation plan.

### Lane County Code

- Date of last revision: June, 2004
- Plan Owner: Lane County Board of Commissioners
- Plan Description: Several of the chapters of the Lane Code (including but not limited to 9, 10, 11, 12, 13, 15, and 16) establish how land within the county will be zoned, and how people may develop land based on the zoning regulations. Some of the code's goals include (but are not limited to): promoting and protecting the public safety, welfare, and health; providing for and encouraging a safe transportation system; protecting life and property in areas that are prone to flooding, landslides, and other natural hazards; protecting and planning for the responsible use of natural resources. Certain chapters of the code align with the county's Comprehensive Plan.
- Plan Cycle: The county codes are reviewed annually.
- Relation to hazard mitigation: County codes influence the where and what types of development are allowed within Lane County. Development in certain areas can exacerbate the impact of natural hazards on a community and may also inhibit residents' abilities to prepare for and respond to natural hazards. The county codes also influence the way the county can and does implement the requirements for Oregon Statewide

Planning Goal 7, which regulates areas affected by natural hazards. County codes influence the development and expansion of the roads within the county, an important components of the county's transportation network. The safety and efficiency of the county's roads impact residents' abilities to evacuate and emergency response personnel's abilities to respond in the event of natural hazards.

### **Lane County Strategic Plan**

- Date of last revision: May, 2001
- Plan Owner: The Lane County Board of Commissioners
- Plan Description: The plan was created to help “guide current and future leaders about what public services the county should provide, at what level and how the services should be delivered.”<sup>2</sup> The guidance provided by the Strategic Plan will improve the county government's ability to provide services and resources to help ensure the safety and health of citizens of Lane County
- Plan cycle: Plan revisions and updates can be made as community conditions and government requirements change.
- Relation to hazard mitigation: Specific plan goals include assisting communities in developing transportation and telecommunications infrastructure, housing, growth management, and land development; helping maintain a healthy environment throughout the county; and helping to maintain and protect the public's assets. The goals are to be implemented through specified strategies listed in the plan. The service improvement strategy, specifically, can be linked to Natural Hazard Mitigation Plan action items aimed at ways the county can implement Statewide Planning Goal 7 requirements, improve citizens' access to information, and ways the county government can assist its citizens regarding natural hazard mitigation.

### **Capital Improvement Program (CIP)**

- Date of last revision: May 11, 2005
- Plan Owner: Lane County Board of Commissioners
- Plan Description: The purpose of the five-year CIP is to financially plan for capital improvements to Lane County's transportation systems that will improve efficiency, safety, utility and that will plan for future growth accommodation.
- Plan cycle: the Board of Commissioners updates the plan annually.
- Relations to hazard mitigation: Many of the capital improvement projects include improving the safety of roads, intersections, bridges, and utilities and bringing them up to

code. Having updated, safe roads and bridges will aid emergency response personnel in the event of a natural hazard. Recommendations for projects that consider or include natural hazard mitigation could be made to improve and update infrastructure to be more disaster resistant. Improving infrastructure to be more disaster resistant reduces the amount of potential infrastructure damage caused by natural hazards, reducing the cost of repairs.

### **Transportation System Plan (TSP)**

- Date of last revision: June 4, 2004
- Plan Owner: Lane County Board of Commissioners.
- Plan Description: The TSP is a 20-year plan that complies with state requirements of OAR 660-012. It was adopted by the Lane County Board of Commissioners on May 5, 2004, and became effective on June 4, 2004. It serves to improve the planning and management of the county's transportation system by providing guidance for coordinating the existing transportation system with transportation agencies, land use requirements, and future needs and projects.
- Plan cycle: Plan revisions and updates can be made as community conditions and government requirements change.
- Relations to hazard mitigation: Infrastructure and public safety are priorities of the plan. Additionally, the plan is updated to reflect new county projects and needs. As previously mentioned, having safe and effective roads that are up to code assist residents and emergency response personnel in efficient evacuation and response in the event of a natural hazard. Recommendations for projects that consider or include natural hazard mitigation could be made to improve and update infrastructure to be more disaster resistant. Improving infrastructure to be more disaster resistant reduces the amount of potential damage caused to infrastructure by natural hazards, reducing the cost of repairs.

### **1980 Parks and Open Space Plan**

- Date of last revision: January, 1981, but is in the process of being revised.
- Plan Owner: Lane County Parks Advisory Committee and the Lane County Planning Commission
- Plan Description: The plan helps the county meet Statewide Planning Goals 5 and 8, by planning for the current and future parks, open spaces, and recreational needs of the county.
- Plan cycle: There is no listed plan maintenance schedule, though the plan is currently in the process of being revised.

- Relation to hazard mitigation: Planning for current and future parks and open space needs affects land use and development, as well as where population growth occurs within the county. The location and types of human development within the county can affect the impact a natural hazard would have on the county. Additionally, the *Parks and Open Space Plan* is a part of the county's *Comprehensive Plan*, allowing the county to acquire property prone to floods. Using such property as parks and open spaces reduces the risk and potential for losses of life and property caused by future flood events.

### **Lane County Public Works Strategic Plan: 2005-2007**

- Date of last revision: March 16, 2005
- Plan Owner: Lane County Public Works
- Plan Description: The plan is designed to help insure safe and cost-effective improvements to the county's infrastructure to promote the long-term viability of the county's built and natural environments.
- Plan cycle: The plan is to be reviewed regularly to address changing needs, conditions, and improved accuracy of assessments.
- Relation to hazard mitigation: County infrastructure is a critical community value to be protected against loss and damage from natural hazards. Promoting and encouraging infrastructure improvements that minimize or eliminate damage to county infrastructure in the event of a natural hazard aids the county's natural hazard mitigation efforts.

### **Regional Housing Rehabilitation Program**

- Date of last revision: March 16, 2005
- Plan Owner: Lane County Community and Economic Development program in partnership with St. Vincent de Paul
- Plan Description: The program provides low-interest rate loans, of up to \$25,000, to low to moderate-income homeowners. Homeowners can use the loans to complete safety and structural improvements to their homes. Loan recipients do not need to make monthly payments for the first 20 years of the loan, or until the home is sold.
- Plan cycle: Information on program reviews was not available.
- Relation to hazard mitigation: Homeowners who receive RHRP loans can use the money to improve their home's resistance to natural hazards. Assisting homeowners in reducing their risk to damage from natural hazards aids the county's natural hazard mitigation efforts.

## **Coastal Resources Development Plan**

- Date of last revision: 1991
- Plan Owner: Lane County Land Management
- Plan Description: This plan addresses Statewide Planning Goals 16-19. It used inventories of Lane County's coastal areas to identify the different types of existing coastal ecosystems. The plan's intent is to provide a "diverse mixture of use and preservation" to help ensure the protection of natural resources, and maintain economic, environmental, and social values.
- Plan cycle: Plan revisions and updates can be made as community conditions and government requirements change.
- Relation to hazard mitigation: The conditions of the coastal areas can influence the amount of damage and loss caused by a natural hazard event. Plan action items can be added or revised to include strategies or steps that incorporate natural hazard mitigation planning and ways to implement Statewide Planning Goal 7 requirements.

## **Lane County General Plan: County-Wide Policies**

- Date of last revision: January 1975
- Plan Owner: Lane Council of Governments
- Plan Description: The General Plan intends to prepare for growth and development within the county while maintaining the quality of life for the county's residents and visitors. The plan attempts to do so by providing standards for land use development and activities.
- Plan cycle: Plan revisions and updates can be made as community conditions and government requirements change.
- Relation to hazard mitigation: The plan strives to protect the natural environment, and promote the responsible use of natural resources. Plan action items can be added or revised to influence the ways in which the county implements Statewide Planning Goal 7 requirements, and can include strategies or steps that incorporate natural hazard mitigation planning.

## **Rural Comprehensive Plan**

- Date of last revision: Revisions to parts of the plan have been occurring since 1984.
- Plan Owner: Lane Council of Governments
- Plan Description: The plan "lays out approaches for interpretation of county planning needs and means of complying with State of Oregon planning law,"<sup>3</sup> regarding the development of rural areas within the county. This plan specifically addresses Statewide Planning Goals 1-15.

- Plan cycle: Plan revisions and updates can be made as community conditions and government requirements change.
- Relation to hazard mitigation: The plan addresses Statewide Planning Goals 1-15. How and where human development occurs within the county can affect the impact and damage done by natural hazard events. Plan action items can be added or revised to include strategies or steps that include natural hazard mitigation planning.

### **Air, Rail, Water, and Pipelines Map**

- Date of last revision: April, 2003
- Plan Owner: Lane County Public Works.
- Plan Description: This map displays the locations of airport, rail lines, natural gas pipelines, and petroleum pipelines within Lane County.
- Plan cycle: No information on map maintenance was available.
- Relation to hazard mitigation: In planning for, or estimating areas within Lane County that could potentially be affected by certain natural hazards, these maps can be used to approximate potential impacts to airports, rail lines, and natural gas and petroleum pipelines within the county.

### **Lane Transit District Map**

- Date of last revision: Unknown
- Plan Owner: Lane County Public Works.
- Plan Description: This map displays the boundaries of the Lane Transit District and the Amtrak Rail Lines within Lane County.
- Plan cycle: No information on map maintenance was available.
- Relation to hazard mitigation: In planning for, or estimating areas within Lane County that could potentially be affected by certain natural hazards, these maps can be used to approximate potential impacts to LTD and Amtrak.

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<sup>1</sup> Burby, Raymond J., ed. 1998. *Cooperating with Nature: Confronting Natural Hazards with Land-Use Planning for Sustainable Communities*.

<sup>2</sup> Lane County. 2005. "Strategic Plan: 2001-2005."  
<<http://www.co.lane.or.us/CAO/documents/StrategicPlan.pdf>>.

<sup>3</sup> Lane Council of Governments. 1984. "Rural Comprehensive Plan."

# Appendix C

## List of Acronyms

### County and Regional

CIP	Capital Improvement Plan
CREW	Cascadia Region Earthquake Workgroup
CWPP	Community Wildfire Protection Plan
DPC	Disaster Policy Council
EWEB	Eugene Water and Electric Board
FD	Fire Department
LC	Lane County
LCEM	Lane County Emergency Management
LCLMD	Lane County Land Management Division
LCPH	Lane County Public Health
LCPW	Lane County Public Works
LCOG	Lane Council of Governments
LTD	Lane Transit District
MWMC	McKenzie Willamette Medical Center
PIO	Public Information Officer
RFD	Rural Fire District
RHRP	Regional Housing Rehabilitation Program
SHMC	Sacred Heart Medical Center
SUB	Springfield Utility Board
SWCD	Soil and Water Conservation District
TSP	Transportation System Plan

### Oregon

AGC	Associated General Contractors
AOC	Association of Oregon Counties
BCD	Building Codes Division (Department of Consumer and Business Services)
BPA	Bonneville Power Administration
CPW	Community Planning Workshop (University of Oregon)
DAS	Department of Administrative Services
DCBS	Department of Consumer and Business Services

DEQ	Department of Environmental Quality
DHS	Department of Human Services
DLCD	Department of Land Conservation and Development
DOGAMI	Department of Geology and Mineral Industries
DSL	Division of State Lands
ESD	Education Service District
GNRO	Governor's Natural Resources Office (State of Oregon)
IHMT	Interagency Hazard Mitigation Team
LCDC	Land Conservation and Development Commission (State of Oregon)
LOC	League of Oregon Cities
OAR	Oregon Administrative Rules
OCS	Oregon Climate Service
ODA	Oregon Department of Agriculture
ODF	Oregon Department of Forestry
ODFW	Oregon Department of Fish and Wildlife
ODOT	Oregon Department of Transportation
OEM	Office of Emergency Management (Oregon State Police)
OEMA	Oregon Emergency Management Association
OERS	Oregon Emergency Response System
OHIRA	Oregon Hazard Identification and Risk Assessment
ONHW	Oregon Natural Hazards Workshop (University of Oregon)
ORHUG	Oregon HAZUS User Group
ORS	Oregon Revised Statutes
ORVOAD	Oregon Voluntary Organizations Active in Disaster
OSFM	Office of State Fire Marshal (Oregon State Police)
OSP	Oregon State Police
OSSPAC	Oregon Seismic Safety Policy Advisory Commission
OSU	Oregon State University
OUS	Oregon University System
OWEB	Oregon Watershed Enhancement Board
PSU	Portland State University
PUC	Public Utility Commission

WRD Water Resources Department

**Federal**

AASHTO American Association of State Highway and Transportation Officials

AIA American Institute of Architects

APA American Planning Association

ARC American Red Cross

ARES Amateur Radio Emergency Services

ASCE American Society of Civil Engineers

ATC Applied Technology Council b/ca benefit/cost analysis

BFE Base Flood Elevation

BLM Bureau of Land Management

BSSC Building Seismic Safety Council

CDBG Community Development Block Grant

CERT Community Emergency Response Team

CFR Code of Federal Regulations

CRS Community Rating System

CVO Cascade Volcano Observatory (USGS)

DFIRM Digital Flood Insurance Rate Map

DMA 2000 Disaster Mitigation Act of 2000

EDA Economic Development Administration

EPA Environmental Protection Agency

ER Emergency Relief

EWP Emergency Watershed Protection (NRCS Program)

FAA Federal Aviation Administration

FAS Federal Aid System

FEMA Federal Emergency Management Agency

FIRM Flood Insurance Rate Map

FMA Flood Mitigation Assistance (FEMA Program)

FTE Full Time Equivalent

GIS Geographic Information System

GNS Institute of Geological and Nuclear Sciences (International)

GSA General Services Administration

HAZUS	Hazards U.S.
HBA	Home Builders Association
HMGP	Hazard Mitigation Grant Program
HMST	Hazard Mitigation Survey Team
HUD	Housing and Urban Development (United States, Department of)
IBHS	Institute for Business and Home Safety
ICC	Increased Cost of Compliance
IHMT	Interagency Hazard Mitigation Team
MH	Multi-hazard
NCDC	National Climate Data Center
NFIP	National Flood Insurance Program
NFP	National Fire Plan
NFPA	National Fire Protection Association
NHMP	Natural Hazard Mitigation Plan (also known as “409 Plan”)
NIBS	National Institute of Building Sciences
NID	National Inventory of Dams
NIFC	National Interagency Fire Center
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NPS	National Park Service
NRCS	Natural Resources Conservation Service
NWS	National Weather Service
PDM	Pre-Disaster Mitigation
SBA	Small Business Administration
SEAO	Structural Engineers Association of Oregon
SHMO	State Hazard Mitigation Officer
TDR	Transfer of Development Rights
UGB	Urban Growth Boundary
URM	Unreinforced Masonry
USACE	United States Army Corps of Engineers
USBR	United States Bureau of Reclamation
USDA	United States Department of Agriculture

USFA United States Fire Administration  
USFS United States Forest Service  
USGS United States Geological Survey  
USGS-CVO United States Geological Survey – Cascades Volcano  
Observatory  
WSSPC Western States Seismic Policy Council

**Other**

B/C Benefit-Cost  
GIS Geographic Information System  
MOU Memorandum of Understanding  
STAPLE/E Social, Technical, Administrative, Political, Legal,  
Economic and Environmental