Lane County
Natural Hazards Mitigation Plan
2012 Update

EXECUTIVE SUMMARY

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Executive Summary

Introduction

Lane County Oregon is subject to natural hazards that threaten life and health and have a history of causing extensive property damage. Presidential Disaster Declarations for catastrophic or high-impact events caused by windstorms, floods and snow / ice storms in Lane County were made in 1962, 1964, 1972, 1974, 1996, 1997, 2002 and 2004. At the time of this writing, the Governor of Oregon is awaiting a response from the President of the United States on his request for a Disaster Declaration for nine Oregon counties, including Lane County, for the January 2012 flood event.

To better understand these and other hazards and their impacts on our communities, Lane County adopted a FEMA approved Natural Hazards Mitigation Plan in 2006. This document constitutes the five year update to that Plan (Plan Update). The jurisdictions specifically represented by this Plan Update are the rural, unincorporated areas of Lane County.

A Natural Hazards Mitigation Plan is a requirement for federal mitigation funds. These requirements are spelled out in 44 CFR (Code of Federal Regulations) Part 201.

This Plan Update was prepared by Lane County Emergency Management with substantial input from Lane County Land Management and Public Works Divisions, Oregon Department of Forestry, local utilities and fire service agencies and many other public and private stakeholders over the past five years.

The Plan Update identifies activities that can be taken to reduce safety hazards, health hazards and property damage caused by natural hazards. It focuses on the eight major natural hazards facing Lane County: snow / ice storms, floods, windstorms, wildfires, landslides, earthquakes, tsunamis and drought.

Hazard Identification and Risk Assessment

This Plan Update analyzes the hazards based on several factors: history, vulnerability, maximum threat and probability. History looks at the record of previous occurrences in which some type of extraordinary response was required. Vulnerability considers the percentage of population and property likely to be affected under an “average” occurrence of the hazard. Maximum threat is concerned with the highest percentage of population and property that could be impacted under a worst-case scenario. Probability evaluates the likelihood of future occurrence within a specified period of time.

The methodology used was first developed by the Federal Emergency Management Agency (FEMA) circa 1983, and gradually refined by Oregon Emergency Management (OEM) over the years.

The methodology produces scores that range from 24 (lowest possible) to 240 (highest possible). By applying one order of magnitude from lowest to highest, a hazard with a score of 240 is considered ten times more severe than a hazard with a rating of 24.

For Lane County, this analysis allows comparison of the same hazard across various local jurisdictions; for example, the score for the windstorm or earthquake in central Lane County will differ from the score in coastal Lane County. Therefore, two hazard analyses are produced for Lane County due to the diversity of Lane County's geography. The following tables were prepared

Lane County – Central. This table summarizes the score for each hazard in central Lane County.

HAZARD	HISTORY WF=2	VULNERABILITY WF=5	MAXIMUM THREAT WF=10	PROBABILITY WF=7	TOTAL
Snow/Ice Storm	10 x 2 = 20	10 x 5= 50	10 x 10 =100	10 x 7 = 70	240
Flood	10 x 2 = 20	7 x 5 = 35	5 x 10 = 50	8 x 7 = 56	161
Windstorm	10 x 2 = 20	4 x 5 = 20	4 x 10 = 40	10 x 7 = 70	150
Wildfire	10 x 2 = 20	5 x 5 = 25	5 x 10 = 50	8 x 7 = 56	131
Domestic Terrorism	9 x 2 = 18	3 x 5 = 15	4 x 10 = 40	8 x 7 = 56	129
Landslide	8 x 2 = 16	2 x 5 = 10	5 x 10 = 50	4 x 7 = 28	104
HazMat Incident	10 x 2 = 20	2 x 5 = 10	1 x 10 = 10	8 x 7 = 56	96
Earthquake	8 x 2 = 16	4 x 5 = 20	4 x 10 = 40	2 x 7 = 14	90
Volcano	1 x 2 = 2	4 x 5 = 20	3 x 10 = 30	1 x 7 = 7	59

Lane County – Coastal. This table summarizes the score for each hazard in coastal Lane County.

HAZARD	HISTORY WF=2	VULNERABILITY WF=5	MAXIMUM THREAT WF=10	PROBABILITY WF=7	TOTAL
Windstorm	0 x 2 = 20	10 x 5 = 50	10 x 10 = 100	10 x 7 = 70	240
Earthquake/Tsunami	0 x 2 = 0	7 x 5 = 35	10 x 10 = 100	4 x 7 = 28	191
Flood	10 x 2 = 20	7 x 5 = 35	5 x 10 = 50	8 x 7 = 56	161
Snow/Ice Storm	1 x 2 = 2	1 x 5 = 5	4 x 10 = 40	1 x 7 = 7	57
Domestic Terrorism	6 x 2 = 12	3 x 5 = 15	4 x 10 = 40	7 x 7 = 49	116
Landslide	8 x 2 = 16	5 x 5 = 25	6 x 10 = 60	10 x 7 = 70	171
HazMat Incident	10 x 2 = 20	2 x 5 = 10	1 x 10 = 10	8 x 7 = 56	96
Wildfire	1 x 2 = 2	2 x 5 = 10	2 x 10 = 20	2 x 7 = 14	46

Updated Mitigation Strategy

The goals for the 2006 edition of Lane County's Natural Hazards Mitigation Plan are still relevant today and are central to this Plan Update. The goals focus on reducing or avoiding long-term vulnerabilities to hazards in Lane County:

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

Preventive Measures in Community Planning

Lane County has several means for implementing preventive measures to protect new construction from hazards and to see that future development does not create unintended consequences in the form of hazardous conditions or economic loss. There are several ordinances in Lane Code that assist with achieving hazard mitigation through these types of preventive measures. Lane County Public Works, Land Management Division administers these preventive measures

Planning and Zoning

Lane County has several combining zones outlined in Lane Code that help direct development away from hazardous areas by designating land uses that are more compatible to the natural conditions of the land. Among other things, these types of zoning regulations help mitigate natural hazards.

Lane County Firewise Incentive Program

In 2009, Lane County adopted policies in Lane Manual Chapter 4.3 to establish a grant incentive program designed to mitigate the risk of wildfire to rural residents.

The mission of the Lane County Firewise Incentive Program is to promote home construction and landscaping techniques that will prevent fatalities, injuries, property loss and environmental damage resulting from wildfires.

To help achieve this mission the program provides funding to partially or wholly reimburse the costs that rural home owners incur for certain types of home and landscaping improvements. These improvements are promoted by the National Firewise Communities Program[1] and if implemented properly have been shown to reduce the probability that a home will be damaged or destroyed in a wildfire.

Land Divisions

Lane Code 13.050 stipulates that any area determined to be dangerous for road or building development by reasons of geological conditions, unstable subsurface conditions, groundwater or seepage conditions, floodplain, inundation or erosion or any other dangerous condition shall not be divided or used for development except under special considerations and restriction. Special consideration and restriction shall consist of a detailed report by a professional engineer stating the nature and extent of the hazard and recommending means of protecting life and property from the potential

[1] The National Firewise Communities Program is an interagency effort designed to encourage local solutions for wildfire safety by involving homeowners, planners, community leaders, developers, firefighters and others in an effort to protect people and property from the risk of wildfire – before a fire starts. The Firewise approach focuses on planning, landscaping, construction, and home maintenance to help protect people, property, and natural resources. Additional information about the National Firewise Communities Program can be found at: www.firewise.org.

hazard and/or the County shall impose limitations designed to minimize the known danger on development commensurate with the degree of hazard.

Parks and Open Space

Keeping the floodplain and other hazardous areas open and free from development is effective for preventing damage to new developments.

Lane County has preserved approximately 31,520 acres in the Severe Flood Hazard Area (SFHA) as open space with additional land preserved in a natural state.

Although natural hazard mitigation is not an explicitly stated goal in Lane County's Parks & Open Space Master Plan, Lane County owns or maintains 73 parks totaling over 4300 acres. Approximately 85% of the parks are located in a floodplain combining zone which naturally contributes to flood hazard mitigation.

2006 Action Item Update

The action items for the Natural Hazards Mitigation Plan were established by the committee in 2006 and many accomplishments were achieved. However, during the comprehensive review that was conducted as part of the updating the plan, several problems were identified with the original crafting of the action items.

- Action items were written for every type of hazard resulting in a significant amount of redundancy and overlap among the action items. In other words, one type of action item applied to many hazards and was, in essence, repeated multiple times.
- The hazards were not prioritized prior to creating the action items;
- Some action items were assigned to agencies that were not adopters of the plan and some agencies were not at the table at the time the action items were created.
- The action items did not address all of the county departments that have a role in hazard mitigation.

Consequently, this Plan Update adopts a new structure for the action items. A more strategic approach was used to allow more flexibility for achieving the intent of the action item. New funding opportunities and disasters occurring elsewhere that create a local sense of urgency can both be motivating factors for accelerating the accomplishment of an action item's intent in unanticipated ways. Therefore the Plan Update uses a broader definition for each Action Item to encourage continuous

reflection and contemplation about the wide range of things that can be done to reduce hazards and to encourage more frequent status updates on each action item.

Additionally, a shorter list of broad reaching action items makes it easier to keep the list of action items in front of county agencies and the public as constant reminders that we all need to do our part. Another benefit to this approach is that it makes the county's Plan easier for small cities and the local tribe to adopt. The action items could apply to all jurisdictions and, with the addition of just a few jurisdiction-specific action items, a small city or tribe could be on its way to implementing its own Natural Hazards Mitigation Plan.

2012 Program Action Items

The Program Action Items are the central feature of this Plan Update. The original steering committee has been replaced by a Mitigation Coordinating Committee to monitor execution of the Plan and act as a forum for hazard mitigation ideas and issues.

There were several factors considered in determining the action items for the next five years. This Plan Update is being written during a time that the United States is experiencing unprecedented economic hardship. Consequently, what could not be ignored is the ubiquitous problem of shrinking budgets and thinning resources. Therefore, to keep the plan meaningful, potential action items were prioritized and only those meeting the following criteria were included in the Plan:

- Does the purpose of the Action Item (AI) align with the core mission of Lane County government?
- Is there motivation to carry out the AI?
- Do we know what to do to carry out the AI?
- Does the AI address some of our most pressing challenges?
- Is implementing the AI feasible in terms of cost and resources?
- Are there tangible benefits?

Action Item 1. Mitigation Coordinating Committee

Establish Mitigation Coordinating Committee to act as a forum for hazard mitigation issues, disseminate hazard mitigation ideas and activities to all participants, monitor implementation of the Action Items and report on progress and recommended changes to the Plan as appropriate; includes identifying opportunities to incorporate mitigation actions into other planning mechanisms, such as comprehensive or capital improvements, as appropriate.

Action Item 2. Public Education and Outreach

Conduct public outreach activities related to natural hazard mitigation and personal preparedness using a variety of media sponsored by various agencies, such as:

a. Community newsletters and direct mailings
b. News releases and public service announcements
c. Presentations at meetings of neighborhood, civic or business groups
d. Displays in public buildings or shopping malls

Action Item 3. Utilize HAZUS-MH Software

Develop in-house competency with HAZUS-MH software so that additional loss-estimation data can be provided regarding reducing the effects of hazards on existing buildings and infrastructure.

Action Item 4. Hazard Mapping

Develop a list of hazard types to be mapped; identify, locate and obtain the necessary data and create hazardous area maps. Plot critical facilities and infrastructure on the hazardous area maps to show their location within the hazard areas.

Action Item 5. Vulnerable Populations Database / Registry

Expand existing special needs population data to include detailed inventory of all at-risk communities (elderly, homeless, disabled, etc.) that are without access to transportation and communication and determine mechanisms for alert/ warning and evacuation.

Action Item 6. Refine and Update Land Use Regulations

Review and develop recommendations to the Lane County Board of Commissioners for additions and enhancements to the Lane County Rural Comprehensive Plan (RCP) Goal 7, Natural Hazards Inventory and implementing land use regulations in Lane Code for the following known risks:

- channel migration areas
- dam failure inundation areas
- expanded wildland-urban interface areas
- landslide / unstable slopes
- special flood hazard areas (as updated studies and maps are produced)
- tsunami inundation areas
- updated dune migration areas
- volcanic debris flow paths

Action Item 7. Examine Tsunami Warning Response Protocols

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.

Action Item 8. Upsize Culverts and Storm Water Drainage Systems

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.

Action Item 9. Backup Power for Critical Facilities

Identify which critical facilities in Lane County need backup power and emergency operations plans to deal with power outages.

Action Item 10. Planning for Terrorist Incidents

Enhance emergency planning, emergency response training and equipment to address potential terrorist incidents.

Action Item 11. Cost-Benefit Review of Mitigation Action Items

During the next five year cycle of Plan implementation and review, more consistently conduct periodic review and prioritization of goals and action items and, conduct cost-benefit analysis to ensure we are adapting to changing priorities and economic crisis while at the same time capitalizing on the most beneficial projects for mitigating hazards and reducing risk.

Action Item 12. Planning for Pandemic Illness and Other Health Hazards

Enhance emergency planning, emergency response training and equipment to address pandemic illness and other health hazards.

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Plan Update Process

Throughout the last five years various approaches were used for updating the plan and implementing projects, including those initially outlined in the 2006 Plan. Over time it became apparent that the breadth of the initial Plan as written was too unwieldy for a single committee to oversee. Additionally, we found interest in the Plan gradually decline as plan reviewers were asked to focus on the entire document regardless of their specific area of interest or expertise. Although plan reviewers were well intentioned and interesting conversations ensued, key decision makers and subject matter experts were oftentimes not present to help advance projects. Consequently, a new approach was needed for keeping the Plan alive.

Adjustments to the plan implementation and review process were gradually made over time. Reviews and updates were conducted on a project-by-project basis which proved to generate more enthusiasm, achieve more results and ultimately engaged more people in the process. Additionally, it was recognized that unexpected incidents and unforeseen situations inevitably emerge therefore the decision was made to keep the Plan flexible enough to address new and emerging projects relevant to natural hazard mitigation.

Outlined below are the annual highlights of the Plan update process demonstrating how neighboring communities, local government and regional agencies and interested parties were involved in the planning process. **All activities listed helped inform the Plan update process.**

Additionally, the plan is open for comment at all times on the Lane County Emergency Management website. The public can view or download the Plan update and submit comments online by clicking on the appropriate link.

http://www.lanecounty.org/Departments/Sheriff/Office/Emermgmt/Documents/EMComment.pdf

Year One: 2007

- The county's Land Management Division (LMD) and Public Works GIS (PW-GIS) staff took on the development of a Community Wildfire Protection Plan (CWPP). Staff met with Oregon Department of Forestry (ODF) and the Lane County Fire Defense Board (comprised of 25 fire chiefs countywide) on several occasions to discuss the CWPP risk assessment and plan. The goal was to coordinate the use of data resulting from new structural vulnerability assessments being conducted by ODF and to evaluate new vegetation hazard data.

  The Land Management Division also worked with the County Parks Department, ODF, several east Lane fire districts and the Willamette National Forest on the three fuels reduction and water supply grants that were awarded for mitigation projects.

  Additionally Lane County Land Management Division submitted a 2007-2008 CWPP grant application for funding through the Lane County Legislative Committee (Title III). The proposal focused primarily on education and outreach projects and was awarded.

  These activities reinforced the importance of keeping public education and outreach central to the Plan.

Year Two: 2008

- Lane County Emergency Management documented the local Flood Threat Recognition system in place as contribution to the Community Rating System (CRS) process. The Lane County Land Management Division is the lead agency in pursuing the CRS credit points for the County.

- Special emphasis this year was on the earthquake hazard in Lane County. A special committee reviewed the DOGAMI report (IMS 24), identified key talking points for briefing elected officials about the hazard and, identified action items for mitigating risks.

  It was further identified that special emphasis should be placed on dam vulnerability. With assistance from the Army Corps of Engineers, the most vulnerable dam identified in Lane County is Fern Ridge dam, which could be subject to liquefaction during a Cascadia Subduction Zone event. As such, a new hazard mitigation project was identified for that hazard that focuses on public education and outreach for residents living downstream of that dam.

Year Three 2009

- The Community Wildfire Protection Plan was presented at an East Lane Forest Protection Association meeting that included a 2009 summer tour to take an in depth look at how Senate Bill 360 gets applied across the landscape, Lane County's role in this effort and to see examples of fuels reduction on high and moderate rating sites.

  The tour provided an opportunity for a group of about 30 people comprised of community members, stakeholders, government officials and elected officials to see how ODF and private landowners can work together with Lane County to reduce the threat of wild fire and to talk with the folks on the ground that make this happen.

Year Four 2010

- A new project emerged in 2010 that involved enaging the community in keeping pharmaceuticals out of the waterways. A major community-wide drug take-back event was held in March. At the time, this was the first attempt at a coordinated effort in Oregon. It provided a multi-pronged opportunity to educate the public about the importance of keeping our drinking water sources free from hazardous chemicals, keeping chemicals out of the landfill, as well as keeping pharmacetuicals out of the wrong hands.

  Key participants were the Eugene Water and Electric Board (EWEB); Springfield Utility Board; City of Eugene Public Works Wastewater and Eugene Police; Springfield Public Works Environmental Services, Springfield Police; Lane County Waste Mangement, Emergency Management, Sheriff's Office, Public Works Waste Manage, Public Health and Youth Services. Also involved were about ten local pharmacists who volunteered their time the day of the event.

  This project helped us see that unanticipated projects can emerge to help mitigate hazards that are not typically addressed by mitigation plans.

- Pandemic Influenza was a major concern in 2010 and a major outreach effort was undertaken to mitigate widespread disease. Mitigation included, but was not limited to, applying an anti-microbial product to all high-traffic public areas in the county public service building, courthouse and parole and probation offices to serve a dual purpose of mitigating against any intentional spread of biological agents as well as the natural spread of H1N1 and other microbials.

  Responding to this unanticipated event led to the inclusion of "*Action Item 12. Action Planning for Pandemic Illness and Other Health Hazards*".

- The county and state worked together to identify high water locations throughout Lane County that might be suitable for a mitigation grant. In August Lane County Emergency Management, Public Works and Oregon Emergency Management representative, Phil Carpenter, toured high water locations. Phil produced a report that will help with identifying specific staff and funding needs.

- Since Lane County is home to nine out of the thirteen US Army Corps of Engineers (USACOE) dams in the Willamette River basin, there was a great deal of countywide interest when USACOE announced the need to repair spillway gates on several dams. The high level of interest provided an excellent opportunity for collaborating on engaging the community in flood mitigation discussions.

  Lane County and the cities of Eugene and Springfield joined the USACOE to presented preparedness information at two well attended community meetings hosted by USACOE in September and October. Additionally, Lane County Emergency Management hosted a Flood Planning Workshop for over 55 agency officials throughout the County followed by a Sandbagging Class presented by USACOE.

Countywide Flood Workshop held at Springfield Public Works, October 1, 2010

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Year Five 2011

- The primary focus for this year has been on an in-depth, comprehensive review of the plan itself to evaluate its usefulness over the long term. This Plan Update creates a stand alone document that is more focused, more succinct, and easier to track than the 2006 edition. The goal is to have an easy-to-use Plan document to serve as a reference guide for all parties (public and private) engaged in mitigation activities. The intent over the next five years is to make a second attempt at an oversight committee but with a more streamlined, focused approach.

Who Was Involved in the Plan Update Process

The goal over the past five years has been to more broadly identify agencies and organizations with a shared understanding of the importance of hazard mitigation and what the Plan is expected to accomplish. Expectations of the mitigation coordinating committee, reviewers and contributors were kept simple and manageable: “participate in mitigation projects and contribute to the Plan document in areas relevant to your area of expertise”. The net was cast wide to create interest and garner participation in the Plan.

Mitigation Coordinating Committee: The individuals listed below provided content to this Plan Update in accordance with their agency or department's core mission with regard to natural hazard mitigation.

- Abby Andrus – Lane County Emergency Management, Research Assistant
- Stacy Burr – Lane County Emergency Management, Contract Researcher
- Linda Cook – Lane County Emergency Manager
- Melissa Crane – Lane County Public Works, GIS Division Supervisor
- Brian Craner – Lane County Building Official
- Brian Johnson – Lane County Public Health, Preparedness Coordinator
- Keir Miller – Lane County Land Management Division, Senior Planner
- John Petsch – Lane County Public Works, Roads Maintenance Planner
- Greg Wagenblast – Oregon Department of Forestry, Eastern Lane

Reviewers and Contributors:

Local Utility Service Providers: All utilities operating in Lane County were invited to participate in a survey for purposes of assisting with the Plan Update. Three utilities participated. See Appendix A for details.

- Blachly Lane Electric Cooperative
- Emerald People's Utility District
- Eugene Water and Electric Board

Lane County Fire Defense Board: Seventeen members of the Lane County Fire Defense Board participated in a survey that was specifically designed to provide essential facility data to HAZUS and to assist with the Plan Update. Many of the responses were incorporated into the Plan Update as appropriate and applicable. See Appendix B for details.

- Coburg Fire District
- Dexter Rural Fire Protection District
- Eugene Fire & EMS Department
- Goshen Fire District
- Hazeldell Fire District
- Junction City Rural Fire Protection District
- Lane County Fire District #1
- Lane Rural Fire & Rescue
- Lowell Rural Fire Protection District
- McKenzie Fire & Rescue
- Oakridge Fire & EMS
- Pleasant Hill Rural Fire Protection District
- Santa Clara Fire District
- South Lane County Fire & Rescue
- Springfield Fire & Life Safety

- Siuslaw Valley Fire & Rescue
- Upper McKenzie Rural Fire Protection District

Additional Reviewers and Contributors:

- Dustin Bengston – U.S. Army Corps of Engineers
- Roger Kline – Eugene Water and Electric Board
- Todd Simmons – Eugene Water and Electric Board
- Karl Morgenstern – Eugene Water and Electric Board
- Mike Russel – Lane County Public Works, Roads
- Jeff Bishop – Lane County Waste Management
- Brian Johnson – Lane County Public Health

- Contributions to this Plan were also received from many of the participants who were involved in the various projects listed under the Plan Update Process section.

Public Involvement

Input was obtained from the public through several concurrent means, including:

- Contact with committee members and their organizations
- As part of Public Education and Outreach events in which committee members participated and Plan elements were discussed
- An internet web page located at www.lanecounty.org/prepare
- A public meeting was held on March 1, 2012 to receive public comments on the draft plan

Updating the Plan

After several incremental, ad hoc updates resulting from the above activities and team member contributions, Lane County Emergency Management staff completed a comprehensive review of all sections of the Lane County NHMP throughout the past year (2011). The goal was to evaluate the document's relevance over the long term. Therefore, the purpose of this formal Plan Update is to track implementation of activities and demonstrate the overall effectiveness of the plan itself.

It has been determined that a substantial re-organization of the Plan would be more effective for a general audience. Therefore, this Plan Update is written so that it can serve as a more succinct, stand-alone document that can be easily read and understood by subject matter experts and the general public alike.

The goal of the Plan re-organization is to provide a tool for continuing to engage the public and give them a chance to provide feedback. This will include periodic presentations on the plan's progress to elected officials, community groups, public meetings and postings on social media and interactive websites.

Keeping the Plan Current

Lane County Emergency Management and Lane County Land Management Division were identified in 2006 as the co-conveners to oversee the plan's implementation and maintenance. Although both entities accomplished much in the past five years, it is recognized that the Land Management Division is subject to an annual work plan set by the Board of County Commissioners that does not always include performing a lead role for Plan maintenance. As such, Lane County Emergency Management will serve in this capacity going forward. Lane County Land Management continues to be an integral contributor to the Plan.

Lane County Emergency Management will be responsible for monitoring implementation over time and tracking the status of identified hazard mitigation actions. An annual progress report will be published and posted on-line every October.

To evaluate the effectiveness of the plan at achieving its stated purpose and goals, the Lane County Emergency Manager will host a semi-annual meeting with all action item owners to discuss progress on the plan in May and September of each year.

Lane County Emergency Management will continue to formally update the Plan at least once every five years.

Community Profile

The state's Office of Economic Analysis estimates the county's 2009 population to be 347,690. This represents an average annual growth rate (AAGR) of 1% from the state's year 2005 estimate of 333,855. Lane County is now the fourth most populous county in Oregon and the third largest Metropolitan Statistical Area (MSA) in the state. The 2009 population reveals a 7.7% increase when compared with 2000 population of 322,959.

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.

After a history of extreme fluctuations related to lumber and wood products, Lane County's industry mix diversified in the 1990s. After the recession of the early 1990s, Lane County attracted high tech companies such as Datalogic (formerly PSC Scanning) and Symantec. In addition, a homegrown recreational vehicle manufacturing industry expanded towards the end of the decade. With growth in high paying jobs came population increases and income growth. This in turn caused the employment in the services and retail sectors to grow. The presence of the University of Oregon and a federal courthouse adds to the diversity through generally stable government jobs.

After a period of relative stability, wood products is again going through a major decline, losing 1,595 jobs between 2005 and 2009 for a low of 3,324 jobs. Manufacturing and transportation equipment has been hard hit, dropping 3,684 jobs since 2005 for a low of 772 jobs in 2009. In trade, transportation and utilities, retail trade is the largest component, employing 19,260 in 2008. The industry lost 1,271, or 6.6 percent, in 2009. The information industry lost 343 jobs, or 9.8 percent between 2008 and 2009. Financial industry has continued to lose jobs since peaking in 2005 at 7,109. It lost 341 jobs in 2009 for a low of 6,307 jobs. Business and professional services grew rapidly through the 1990s due to rapid expansion at temporary employee firms and call centers. As another industry adversely affected by the downturn, it lost 1,706 (-10.5%) between 2008 and 2009. Preliminary 2009 data show that Lane County had 71,012 harvested acres and roughly $113.5 million in total farm sales. Sales were down by about $25.1 million compared with 2008, a loss of 18.1 percent.

Lane County has a slightly higher proportion of employment in education and health services than statewide because five hospitals and several private schools are located here. The five hospitals are Sacred Heart Medical Center at RiverBend, Sacred Heart Medical Center University District, Cottage Grove Community Hospital, Peace Harbor Hospital and McKenzie Willamette Medical Center. While schools in private higher education include Northwest Christian University and Eugene Bible College. Health and

social assistance has been one of the industries that continued to grow throughout the most recent recession, adding 1,065 jobs between 2007 and 2009 to reach 20,070. Private education added 145 over the same period. Leisure and hospitality lost 975 jobs between 2008 and 2009, or 6.5 percent.

Lane County is coming out of a deep recessionary period. Construction and manufacturing, especially RV manufacturing, had large job losses early in the recession. The loss of those high paying jobs then affected the more localized economy with losses in retail and services. Estimates show that Lane County's employment dropped by 17,600 jobs, or 11.2 percent, between October 2008 and February 2009. Lane County's seasonally adjusted unemployment rate was essentially unchanged at 11.1 percent in October of 2010. The adjusted unemployment rate for Lane County is higher than both the state (10.5%) and the nation (9.6%).

The Oregon Employment Department anticipates that Lane County will add 15,046 net new jobs for a growth rate of 9.7% from 2008 to 2018. This compares to a statewide growth rate of 9.1%. Although net growth is expected in all major occupational categories except construction and extraction, 75% of net new jobs will be created in four of the twelve categories. Two of those four categories, professional and office and administrative support will grow at a relatively moderate rate. Services, a relatively large category with an above average growth rate, adds the most new jobs. The fourth, health care, is expected to add new jobs due to rapid growth in the demand for health services caused by the aging of the population.

National trends such as population growth outstripping job-creation, the growing difficulty of getting into the job market due to lack of jobs or inadequate education or training and the continuing loss of full-time jobs (e.g. jobs in timber-related industries) have had a negative economic impact. Service jobs that are created to replace those in the resource-based or manufacturing sector may result in an overall lower economic standard for many people because the jobs pay less and many jobs are part-time with few, if any, benefits. If housing costs continue to increase but overall income levels do not increase at the same rate due to shifts in the economy, then rent and cost burdens will rise for an increasing number of households.

The 2005-2009 US Census American Community Survey counted 139,593 occupied housing units in the county revealing a 7% increase from the 2000 US Census total of 130,453 households.[1] Lane County's population density in 2000 was 70.9 people per square mile. This figure is estimated at 77 per square mile in 2009.[2]

[1] Data collected from US Census 2000 and 2005-2009 Community Survey. The calculated used was percentage of increase of the 2000 occupied housing units (130,453) and the 2009 (139,593) number.
[2] US Census American Community Survey 2005-2009

Table 1. *Population and household comparisons 2000 – 2009.*

Jurisdiction	Estimated Population 2009	2000-2009 Population Change	Number of Households 2000	Estimated Number of Households 2009	Average Household Size	Median Household Income
Lane County	347,690	7.7%	130,453	139,593	2.39	$42,852
Coburg	1,080	11.5%	367	336	2.79	$63,214
Cottage Grove	9,485	12.3%	3,264	3,306	2.71	$42,819
Creswell	4,790	33.8%	1,271	1,953	2.51	$43,750
Dunes City	1,360	9.65%	558	634	2.22	$39,786
Eugene	157,100	13.9%	58,110	62,257	2.26	$44,090
Florence	9,580	31.9%	3,564	4,363	1.91	$35,670
Junction City	5,460	15.7%	1,823	2,170	2.54	$38,662
Lowell	1,030	17%	315	271	2.68	$50,250
Oakridge*	3,755	18.4%	1,345	972	2.34	$26,662
Springfield	58,085	9.9%	20,514	22,666	2.46	$37,738
Veneta	4,975	80.1%	966	1,512	2.65	$45,000
Westfir	340	21.4%	100	116	2.33	$40,625
Unincorporated Areas	90,650	-7.7%	N/A	N/A	N/A	N/A

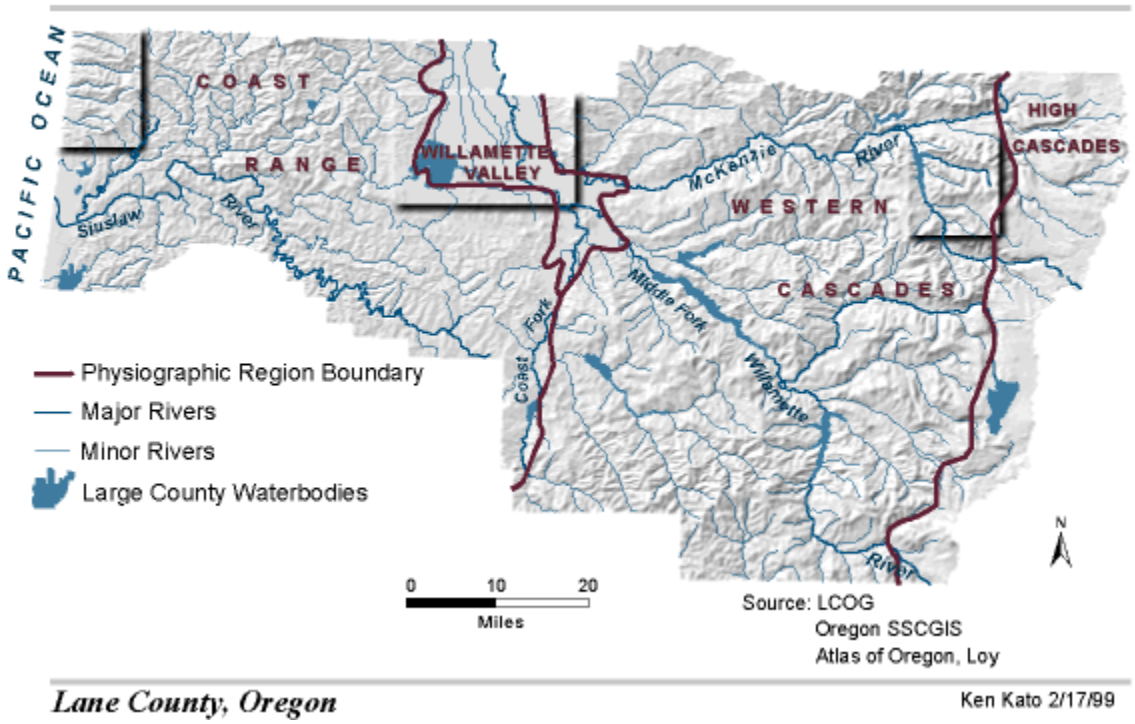
*Data used for Oakridge Estimated Number of Households; Average Household Size; and Median Household Income reflects 2000 Census data.

Hazard Identification and Risk Assessment

This section provides information for understanding the potential and chronic hazards affecting Lane County in order to identify which hazard risks are most significant and which locations are most adversely affected.

Lane County is one of only two counties in Oregon that reaches from the Pacific Coast to the crest of the Cascades. Lane County is located in western Oregon and covers about 4,554 square miles. The geography, topography, climate, and other natural attributes such as vegetation vary markedly throughout the county.

Figure 1. Map of Lane County, Oregon. This map illustrates the geographic expanse of Lane County stretching for the coast of the Pacific Ocean to the Cascade Range.



Geography and Climate Overview

The large size and geographic diversity of Lane County are important factors to consider in mitigation planning for natural and manmade hazards. For planning purposes, we consider five main physiographic regions within Lane County, based on

nomenclature commonly used by the National Weather Service, they are: Coast, Coast Foothills, Willamette Valley Floor, Cascade Foothills and Cascade Range.

Coast Region. The Coast Region is in the western portion of Lane County and is characterized by rocky beaches, sand dunes and other coastal features. Stretching along Oregon's Pacific border, the coast region is known for wet winters, relatively dry summers and mild temperatures throughout the year.

This region is the only portion of Lane County subject to coastal hazards such as storm surge flooding and tsunamis. Occasional strong winds strike the area, usually in advance of winter storms. Wind speeds can exceed hurricane force, and in rare cases have caused significant damage to structures or vegetation. Damage is most likely to occur at exposed coastal locations, but it may extend into inland valleys as well. Such events are typically short-lived, lasting less than one day.

Normal annual precipitation is between 65 to 90 inches. The highest monthly precipitation values for the coast occur in the winter months of November, December, and January. Freezing temperatures at the coast are rare. The months of July, August, and September tend to be the warmest, but average summer temperatures are only about 15 degrees above the coldest month, January.

Coast Range. Stretching the full length of the state, the Coast Range is a heavily forested area with peaks ranging from 2,000 to 5,500 feet above sea level. The area experiences heavy rainfall as a result of moist air masses moving off the Pacific Ocean onto land, especially during the winter months. Spots high on the west slopes of the range may get over 100 inches of rain annually. Snowfall in the Coast Range is minimal, usually only one to three inches annually.

Willamette Valley. Tall mountain ranges and the Willamette River create the V-shaped Willamette Valley that stretches approximately 125 miles long and 60 miles wide. The valley reaches the Oregon – Washington border to the north and the City of Cottage Grove to the south. Lane County is located in the southern portion of the Willamette Valley, characterized by mild temperatures through the year with cool, wet winters and warm, dry summers. The average annual precipitation is less than 40 inches.

Extreme temperatures in the valley are rare. Days with a maximum temperature above 90 degrees Fahrenheit occur only 5-15 times per year on average and, days with below zero temperatures occur only about once every 25 years. Mean high temperatures range from the low 80's in the summer to the low 40's in the winter, while average lows are generally in the low 50's in summer and low 30's in winter.

Although snow falls every few years in the South Willamette Valley, amounts are generally quite low. Valley floor locations throughout Oregon average 5-10 inches per year, mostly during December through February, recognizing that much higher totals are observed at higher elevations in the foothills every year.

Ice storms occasionally occur and high winds typically occur several times per year in association with major weather systems.

Cascade Foothills. The lower elevation area of the western slopes of the Cascade Range is considered the Cascade Foothills. This region is heavily forested and moderately populated in places.

Cascade Range. The dominant terrain feature in Oregon is the Cascade Range, stretching the entire length of the state from the California border to Washington. In eastern Lane County, the Cascade Range is characterized by heavily forested slopes with elevations ranging from an average of 4,000 feet to over 10,000 feet (western slopes of Three Sisters Peaks). This area experiences moderately heavy rainfalls as well as extreme winter conditions with heavy snowfalls. The area has a relatively low population.

Monthly mean snowfall totals vary significantly according to elevation. Since precipitation tends to increase with increasing elevation, more potential moisture for snowfall occurs at higher elevations.

Most of the precipitation in the Cascade Range occurs during the winter months with November through March accounting for more than 75 percent of the total annual precipitation. Spring rain, summer thunderstorms and fall snow all snow contribute to the annual precipitation total, but pale in comparison to winter precipitation totals.

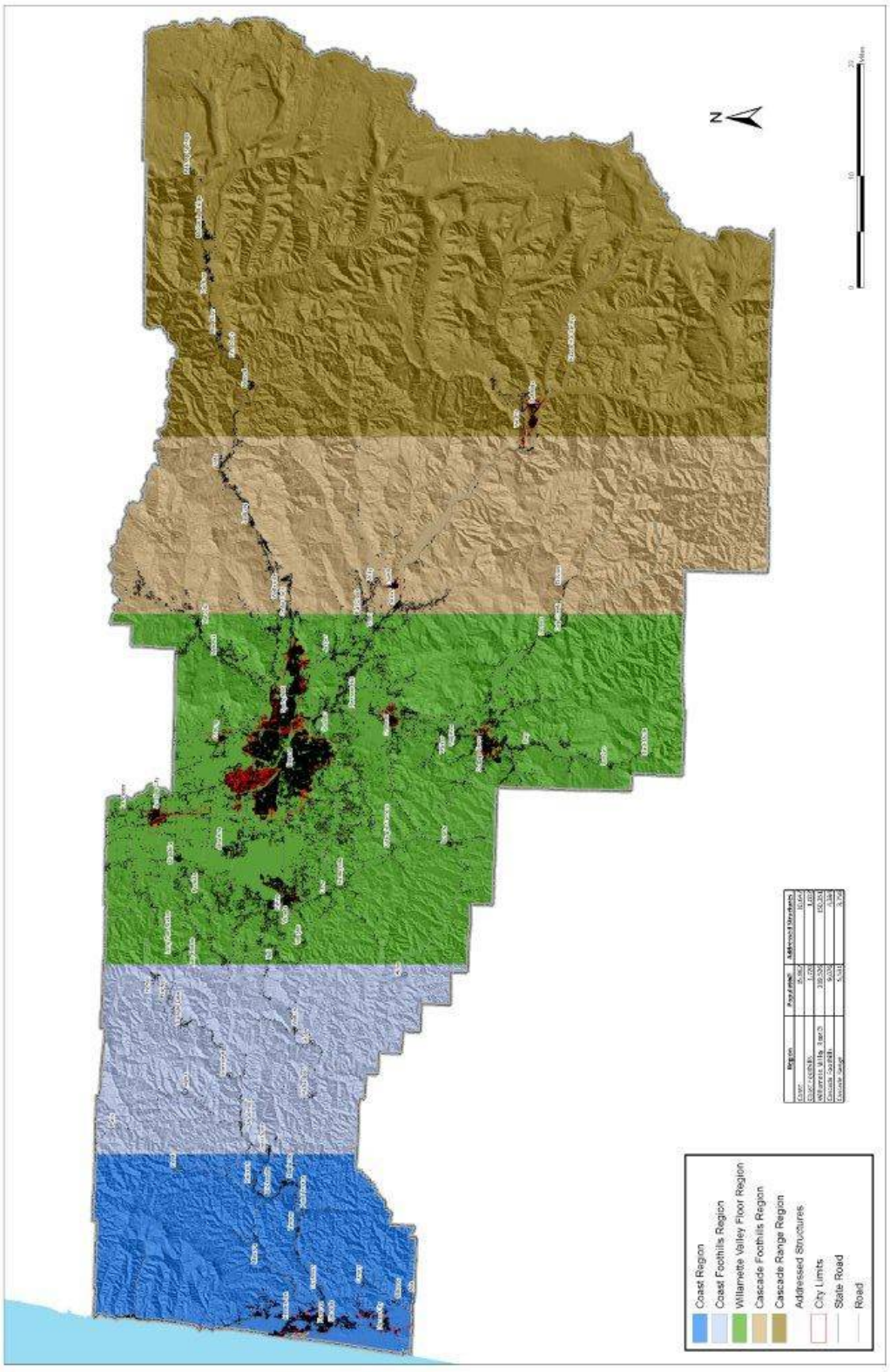
Population and Built Structures in Physiographic Regions

It is important to understand the distribution of population and built structures in each natural hazard area when considering hazard mitigation measures. The map on the following page (Figure 2) shows the distribution of the population and built structures in each of the five main physiographic regions described above while Table 2 below summarizes the data. The built structures are those with an assigned address by the County and do not necessarily include out buildings such as garages, shops, etc.

Table 2. Population and number of structures in each physiographic region potentially affected by natural hazards.

Region	Population	Addressed Structures
Coast	15,862	10,647
Coast Foothills	1,720	1,002
Willamette Valley Floor	319,526	150,351
Cascade Foothills	9,076	4,394
Cascade Range	5,531	3,756

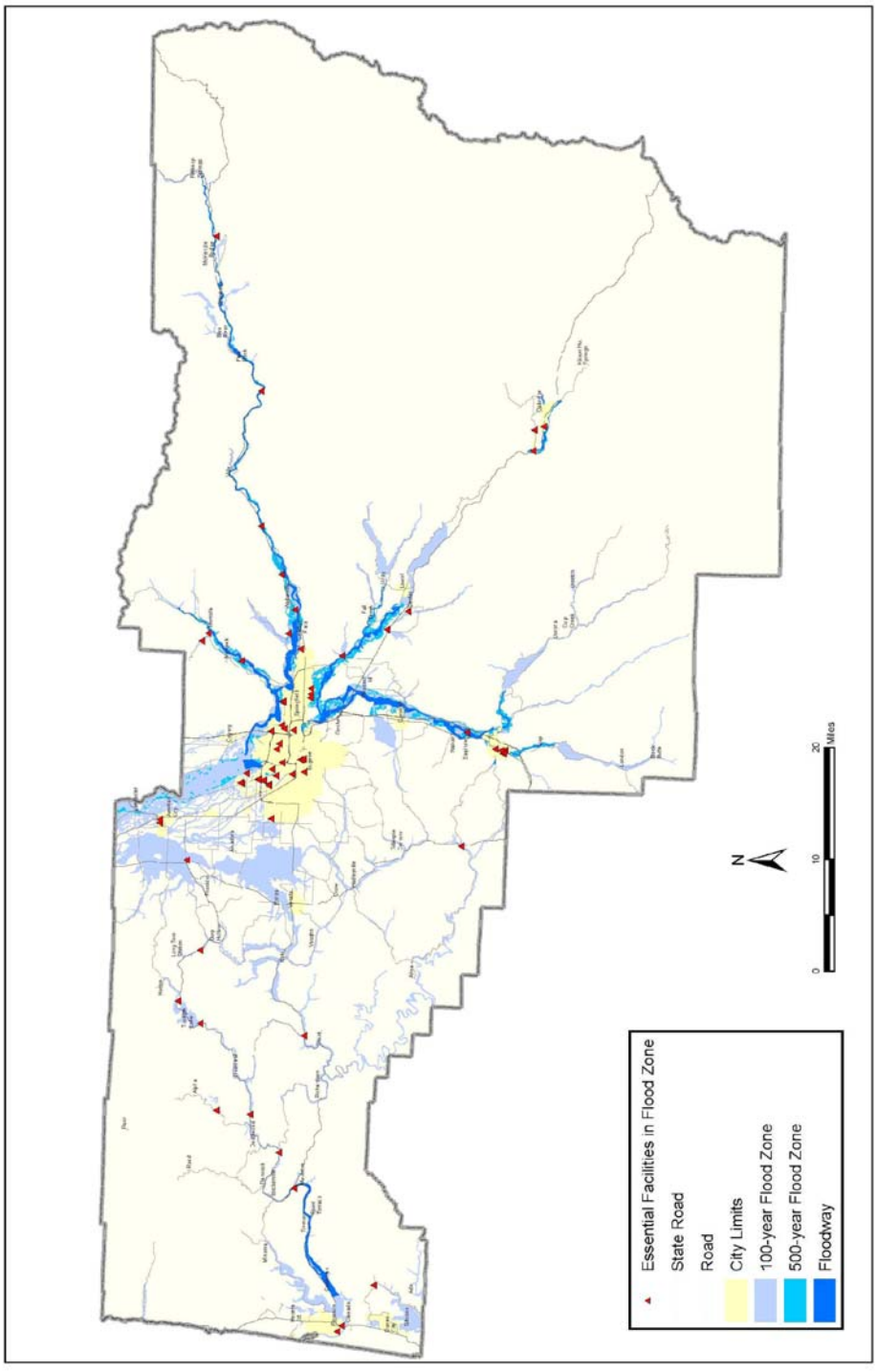
Figure 2. Population density and built structures in 5 main physiographic regions, This map uses color to distinguish the regions.



Essential Facilities in Flood Zone

It is also important to know what essential facilities are located in flood zones or the floodway. These features can be readily identified and shown on a map because we can predict where a flood is likely to occur.

Figure 3. Essential Facilities in Flood Zone. This map shows schools, police and fire stations, Emergency Operations Centers and hospitals located in a flood hazard area.



High Water Locations on County Roadways

A rather specific and serious concern relates to localized flooding and has to do with high water locations on county roadways. These are defined areas that experience some degree of flooding nearly every year. The problems arise from a combination of heavy rainfall and inadequate drainage. The impact of this type of flooding includes impeded access / egress by emergency response vehicles that need to use the roadways as well as economic disruption caused by the general public being unable to use these routes for getting to work, grocery shopping, eating out, etc.

The table below lists the ten high water locations that Lane County Public Works considers their highest priority.

Table 3. Top 10 high water location susceptible to repeated flooding.

Road Number	Road Name	Beginning Mile Post	Ending Mile Post	Average Daily Traffic
3110	Love Lake Road	1.450		1250
4335	Vaughn Road	8.350		750
1628	Coleman Road	0.090	0.370	500
6068	Edenvale Road	0.700	1.000	500
5070	N, Fork Siuslaw Road	5.700		430
6122	Parvin Road	0.400		260
5036	Sweet Creek Road	4.570		200
1625	Herman Road	0.520	0.890	170
4093	Powell Road	0.139		60
4096	Simonsen Road	0.159		50

The maps of the following pages show all of the high water locations countywide that have been identified at the time of this writing. Additionally, a report discussing the results of a High Water Location Tour can be found in Appendix D.

Figure 4. High water locations in central Lane County

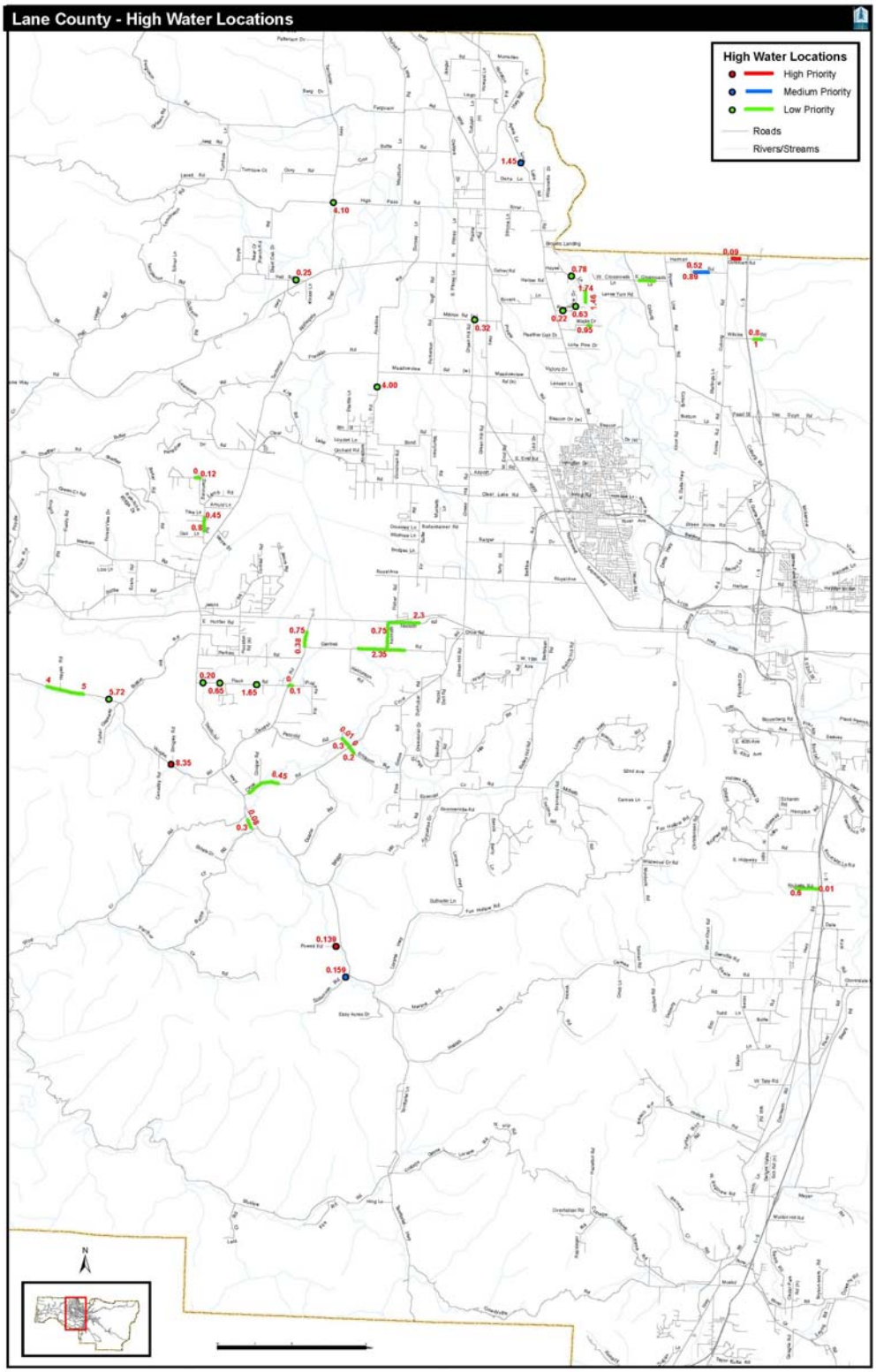


Figure 5. High water locations in eastern Lane County.

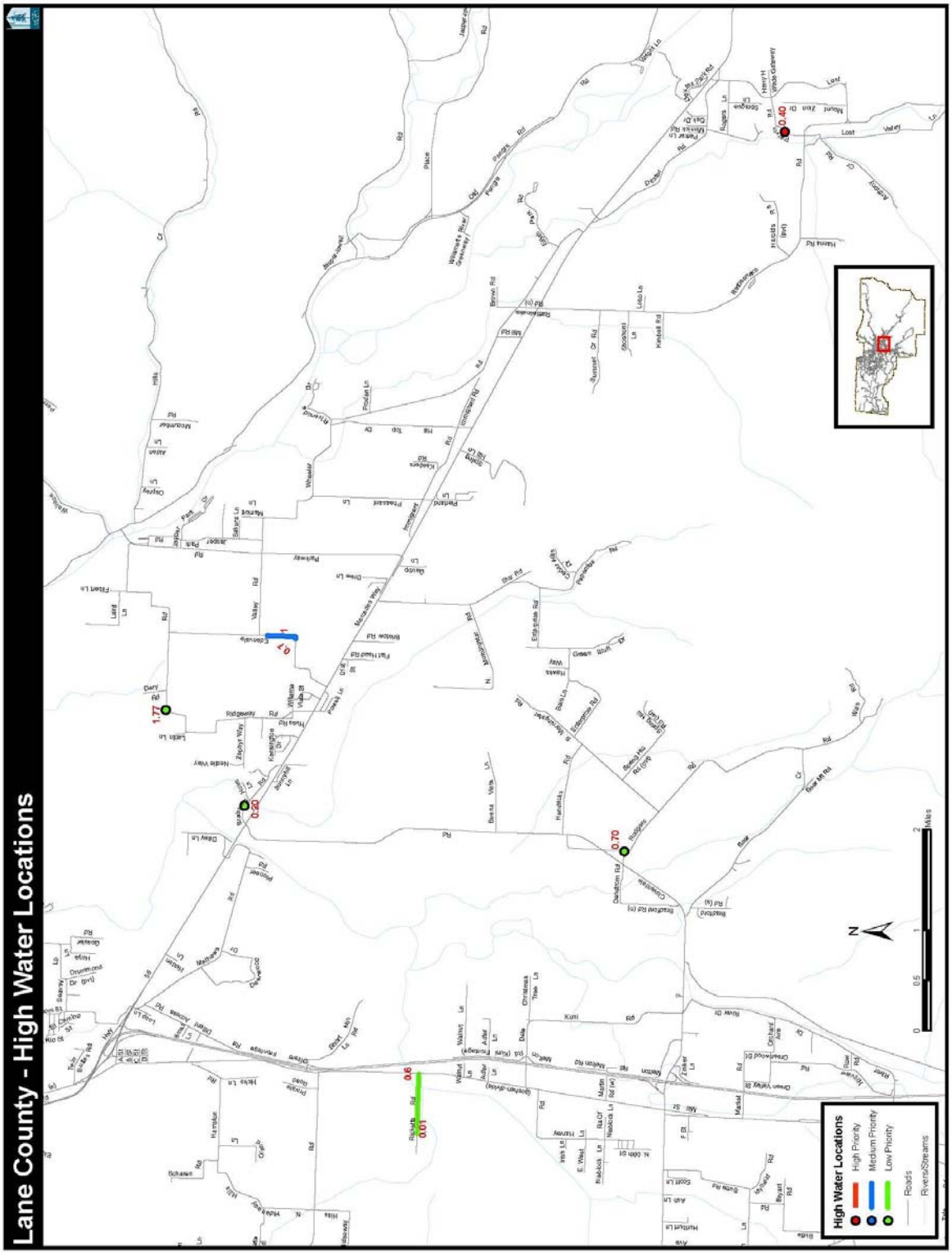
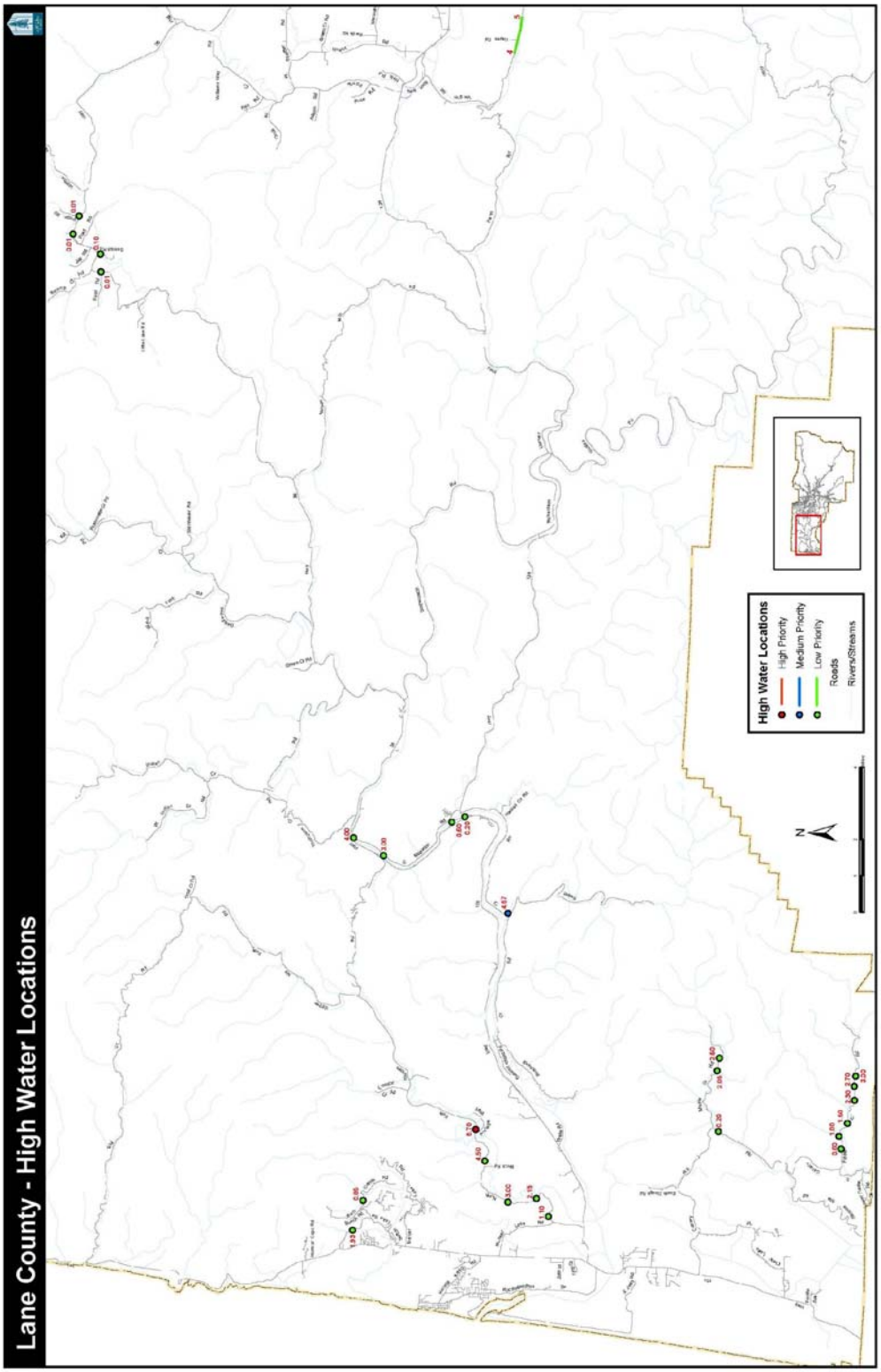


Figure 6. High water locations in western Lane County.



Snow / Ice Storm

Geographic Extent

Snow and ice storms occur most commonly in the Cascade Range and Cascade Foothills in the eastern portion of the County and less frequently in the valley floor.

In eastern Lane County, the average annual snowfall for Oakridge is 12.6" and for McKenzie Bridge the average snowfall is 28.7".

Annual snowfalls impact road conditions. Highway 58 provides a low elevation pass through the Cascades running through the towns of Pleasant Hill, Lowell, Westfir and Oakridge as it passes through to the east Lane County border. Highway 58 closes three to four times per year for several hours at a time.

The same is true for Highway 126 East which runs along the McKenzie River through the towns of Walterville, Deerhorn and Blue River.

Significant Occurrences Since 2006[3]

In the past five years there have been no major disaster declarations related to snow storms. However, there have been significant localized occurrences that may be of interest to the community from a historical perspective.

2011

- **February 14:** Heavy snow reported at 31 inches at the McKenzie SNOTEL[4] (Oregon NRCS, 2007-2008) site located in Lane County in the Willamette National Forest.

- **February 27:** A late February heavy snowfall episode extended into March. A resident of Oakridge measured 13 inches of new snow.

2010

- **November 21:** A strong low pressure system dropped south out of British Columbia bringing cold air and heavy snow to the Cascades in Lane County.

[3] Unless otherwise stated, events listed under Significant Occurrences Since 2006 are from the National Climatic Data Center Storm Event database as retrieved from http://www4.ncdc.noaa.gov/cgi-win/wwcgi.dll?wwEvent~Storms

[4] The McKenzie SNOTEL (for SNOw TELmetry) site is part of the Natural Resources Conservation Service (NRCS) data collection program; the site is located in Lane County in the Willamette National Forest. Site elevation is 4770 ft; Latitude 44.21 Longitude -121.87

- **November 18:** The McKenzie SNOTEL site measured 13 inches of new snow between during an eight hour period on November 18th.

2009

- **February 29:** Snowfall estimates were reported to be 16 to 24 inches at the McKenzie SNOTEL site.

- **March 14:** Seventeen inches of new snow was reported at Willamette Pass along Highway 58.

- **April 2:** Between 15 and 24 inches of storm total snowfall were reported at the McKenzie SNOTEL site.

2007

- **December 25:** A potent Pacific storm brought a substantial snowfall to the Cascades, Cascade Foothills and Coast Range.

2006

- **March 8:** A strong Pacific storm and associated cold front brought relatively late winter conditions to northwest Oregon. Snow totals from this event ranged from a tenth of an inch to a few inches at the coast and throughout the Willamette Valley.

Flood

Geographic Extent

Lane County features several large rivers and smaller tributaries and streams that are susceptible to annual flooding events. The flooding of these waterways threatens life and safety and can cause significant property damage. Large rivers include the Willamette (Main Stem, Middle and Coast Forks) the McKenzie (including the South Fork), the Siuslaw (including the North Fork) the Row River and Lake Creek. Smaller streams and tributaries susceptible to frequent flooding include the Mohawk, Long Tom, Fall Creek, Little Fall Creek, Camp Creek, Horse Creek, Coyote Creek, Mosby Creek, Poodle Creek, Siltcoos River and Tenmile River.

Lane County has nearly 140,000 Acres of land in the floodplain. This is equivalent to well over 200 square miles. Over 11,000 individual parcels are partially or entirely located within the floodplain. Statewide, Lane County has more river miles of floodplain than any other county. Ongoing development

along these rivers continues to displace natural areas that have historically functioned to store flood waters.

The Army Corps of Engineers operates 13 multi-purpose water projects (also known as dams) in the Willamette Valley, with nine of those projects situated in Lane County. These dams were constructed between 1941 and 1968. A primary purpose of these dams is flood control, although they only control flooding on 50% of the tributaries in the Willamette Basin. Reservoirs behind the dams are drained throughout the summer and fall months to create storage capacity for water from heavy winter and spring rains. Therefore, most flooding in Lane County occurs along tributaries and rivers with no flood control devices, such as the Siuslaw and Mohawk rivers.

Flooding occurs when climate, geology, and hydrology combine to create conditions where river and stream waters flow outside of their usual course and "overspill" beyond their banks. In Lane County, the combination of these factors, augmented by ongoing development, create chronic seasonal flooding conditions. Lane County spans a wide range of climatic and geologic regions from the Pacific coast to the high Cascades. This diversity results in considerable variation in precipitation. The average annual precipitation ranges from less than 40 inches in the Willamette Valley to over 100 inches in the Coast Range and along the west slope of the Cascades. Snowmelt from the Central Cascades provides a continuous water source throughout the year, and can contribute significantly to flooding.

Flooding is most common from October through April, when storms from the Pacific Ocean bring intense rainfall to the area. Larger floods result from heavy rains that continue over the course of several days, augmented by snowmelt at a time when the soil is near saturation from previous rains.

Repetitive Loss Properties

Repetitive loss properties are those for which two or more losses of at least $1,000 each have been paid under the National Flood Insurance Program (NFIP) within any 10-year period since 1978.

There are twenty one Repetitive Loss Properties identified in Lane County. The property locations are broken down as follows:

Mapleton	11 residences, 1 business
Springfield	5 residences
Cottage Grove	1 residence
Elmira	1 residence
Vida	1 residence
Walton	1 residence

Significant Occurrences Since 2006[5]

In the past five years there have been no major disaster declarations related to flood in Lane County. However, there have been significant localized occurrences that may be of interest to the community from a historical perspective.

2007

- **December 3:** The Siuslaw River flooded near Mapleton, causing minor lowland flooding. An abnormally long period of consistently heavy rainfall led to widespread flooding, with the worst hit areas in the Coast Range and areas draining from the Coast Range to the Pacific Ocean.

2006

- **January 14:** A series of wet Pacific storms brought heavy rains to the area, causing flooding and damage. The Mohawk River near Springfield flooded and Oregon Governor Ted Kulongoski declared a state of emergency in 24 of Oregon's 36 counties.

- **January 17:** A strong, moisture-laden storm brought heavy rains and flooding to Oregon. The Siuslaw River at Mapleton flooded during the event. Flooding affected widespread low-lying areas and agricultural lands. Flooding was also the cause of multiple road closures around the area.

- **November 7:** The Siuslaw River near Mapleton crested at 18.8 feet with flood stage at 18.0 feet.

- **December 14:** The Siuslaw River near Mapleton crested at 18.3 feet; flood stage for this river is 18.0 feet.

Magnitude or Severity of Past Events

While some type of seasonal flood-related damage occurs nearly every year, the flooding and associated landslide events of February and November 1996 represent the most significant flooding in the recent past.

In February 1996, prolonged precipitation accompanied by an early snowmelt, caused by a warm-weather trend known as a “Pineapple Express,” caused many rivers and creeks throughout Lane County to rise to 100-year flood levels.

[5] Unless otherwise stated, events listed under Significant Occurrences Since 2006 are from the National Climatic Data Center Storm Event database as retrieved from http://www4.ncdc.noaa.gov/cgi-win/wwcgi.dll?wwEvent~Storms

Flooding was particularly severe along the Siuslaw and Mohawk Rivers. (Lane County Land Management Division, 2011)

The Eugene/Springfield metropolitan wastewater system was forced to flush millions of gallons of raw sewage into the Willamette River when rainwater overwhelmed pipes and pumps leading to the treatment plant. If the effluent had not been released sewage would have backed up into buildings and low areas. About 40 residents and businesses reported sewage backups during the storm. (Pittman, 1996)

Damage to Lane County businesses, residences and infrastructure was estimated to be roughly $19 million dollars for this February storm. The approved federal share amounts for this storm's disaster declaration DR-1099-OR were as follows: Federal share approved amount for public assistance for Lane County was $564,608; Individual Assistance for disaster housing was for $720,706; Individual & Family Grant amount was $220,564. Small Business Administration loans reached $1.75M for home loans, $926,500 for business physical loans and $119,700 for economic injury loans.

Later in the year, on November 17 and 18, a moist southwest flow aloft produced moderate to heavy rain and strong winds over southwest Oregon. Storm total rainfall ranged from 8 to 12 inches on the coast with 3 to 7 inches inland. The rainfall amount and rate produced numerous landslides impacting residences and closing highways. Strong winds of 40 – 70 mph were reported on the coast and many trees and power lines were downed across southwest Oregon.

President Clinton declared the state a major disaster area (FEMA, 1997, January 23) after this storm citing damage from severe storms, high winds, flooding and land and mud slides.

Although the floods of 1996 represented a large-scale disaster, they are not unprecedented. The Christmas Flood of 1964 caused $157 million in damage statewide, and 20 Oregonians lost their lives.

In addition to the 1996 and 1964 floods, Lane County has experienced several other significant floods since records have been kept.

- In 1972, flooding along the Siuslaw River in the western portion of Lane County caused extensive damage within the community of Mapleton.
- The floods of 1945, 1942 and 1927 caused severe damage in the valley floor to the City of Eugene and the surrounding areas.
- Early records indicate that the Southern Willamette Valley flooded often in the mid to and late 1800's, with major flooding occurring in 1850-51, 1861, 1881 and 1890.

Probability of Future Events

Based on historical occurrence, Lane County expects a significant flood event every 15 – 20 years however much of the risk is mitigated through dams.

Windstorm

In the past five years there have been no major disaster declarations related to windstorms in Lane County. However, there have been significant localized occurrences that may be of interest to the community from a historical perspective.

Geographic Extent

For Lane County, the highest potential for severe windstorms is highest at the coast and then fairly uniform across the rest of the county. In the hilly areas, however, the level of wind hazard is strongly determined by local conditions of topography and vegetation cover.

For Lane County, the two-year recurrence interval of sustained wind speeds range from about 37 to 47 miles per hour. These two-year wind speeds are generally too low to cause widespread substantial wind damage. However, significant local wind damage can occur at sites where local wind speeds are higher or, where there are especially exposed locations, such as at the boundary between clear cut and forested lands.

For Lane County, the 50-year recurrence interval of wind speeds range from about 62 to 75 miles per hour. These wind speeds are high enough to cause widespread wind damage. Damage may be severe at particularly exposed sites. Thus, for most regions of Lane County winter storms with significant direct wind damage are not likely every year or every few years, but perhaps once every decade or so, on average, with major wind storm events happening at intervals averaging a few decades.

Significant Occurrences Since 2006

2011

- March 13: A severe windstorm whipped through Lane County leaving travelers trapped on a West Boundary Road as they tried to bypass a highway 58 closure. West Boundary Road was impassable at both ends due to downed trees and power lines. Damages to public infrastructure Lane County totaled approximately $1.5 million.

2010

- December 29: In Creswell, a thunderstorm produced a funnel cloud, dime size hail and strong winds. A few trees and branches were blown down.

2007

- June 6: During an afternoon under a particularly cool and unstable airmass, a funnel cloud was sighted near the Eugene airport by the personnel at the Eugene Air Traffic Control Tower.

- December 3: High wind gusts measuring 76 knots were recorded at the Sugarloaf RAWS, about 8 miles west-southwest of Oakridge. The high wind speeds associated with this storm caused widespread damage to the area.

- Decemeber 19: A potent Pacific storm and associated cold front brought strong 52 knot winds to the coast and heavy snow to the Cascades.

2006

- February 3: A strong winter storm brought high winds to portions of western Oregon. Many residents experienced power outages due to trees blown down by strong winds. An estimated 3500 residents of Lane County were without power for portions of the night. $300,000 in damage was reported.

- March 7: A strong Pacific system brought a powerful cold front to northwest Oregon. Strong winds developed ahead of this cold front, and persisted through the event. Florence reported 37 knots. $375,000 in damage was reported.

Magnitude or Severity of Past Events

2011

- A wind storm whipped through Lane County on March 13, 2011 resulting in over $1.5 million in damages to public infrastructure with utilities and school districts being hardest hit.

  Although multiple Oregon counties are typically impacted by the same severe storm, this storm appeared to cause only pockets of damage statewide and nothing severe or widespread enough to trigger the disaster declaration process at the state or federal level. In order for Lane County to have been eligible for federal assistance separate from other counties

damages would have had to meet the state's current threshold of approximately $4.6 million in damages.

2002

- The February 7, 2002 wind storm was the strongest to strike western Oregon in several years. Starting at approximately 4:00 PM and increasing in intensity over the next three to four hours, severe winds gusted ranging from 40 to 70 miles per hour in the valley floor resulting in extensive property, vegetation and electric utility damage. Other associated impacts included interruption of critical services, damage to homes and businesses, damaged vehicles, closure of roads and considerable loss of business revenues.

  On March 12, 2002, President Bush declared a major disaster for the State of Oregon. Lane County's damage estimate for public infrastructure as over $3.5 million.

Probability of Future Events

Based on historical occurrence, Lane County expects a significant windstorm about once every 10 years.

Wildfire

Geographic Extent

The Lane County wildland-urban interface is large, approximately 2,269,000 acres or 3,543 square miles. The size of Lane County's wildland-urban interface is the result of a dispersed population in close proximity to abundant vegetative fuels. Nearly 90% of Lane County is forestland and nearly 2.5 million of the county's 2.9 million acres are zoned non-impacted forestland. The U.S. Forest Service and the Bureau of Land Management own and manage the majority of the zoned property. These forestlands contain extensive fuels comprised of flammable grasses, brush, slash and Timber. Excluding the population of Eugene/Springfield metro area, nearly 100,000 Lane County residents live throughout or adjacent to these forestlands. (Lane County CWPP, 2005)

Significant Events Since 2006

Although there have been thirteen Fire Management Assistance Declarations in the state of Oregon since 2003 (FEMA, 2011) none of these fires occurred in Lane County. Nonetheless, significant fires either in or near the eastern portion of Lane County occur consistent with the state average of about once every four

years. However, in Lane County the cause of fire includes both natural causes such as lightning as well as manmade causes such as arson.

2009

- The **Tumblebug Complex** fire located 23 miles southeast of Oakridge in the Willamette National Forest, started as a series of 25 small fires sparked by lightning. Firefighters knocked down all but three of the fires. The remaining three fires grew rapidly, exploding to 500, then 2,000 and then 12,000 acres as 35 mph winds in drought like conditions spread the fire through unseasonably dry forests.

2008

- Aug 7: Multiple lightning storms started over sixty fires in an approximately 500,000 acre area in the south zone of the Willamette National Forest near Oakridge. Fifty-two of the fires were confirmed, and over 200 acres in total were burned.

Magnitude or Severity of Past Events

2002

- The **Office Bridge** Fire was held to 140 acres, as cooler September weather arrived to bolster efforts of 357 firefighters and aerial crews working on steep, rocky terrain north of the Middle Fork of the Willamette River.

  Residents of nearby communities - Hemlock, southwest of the fire, and Westfir, across the river and to the east of the fire – were placed on a three-hour evacuation notice although no structures were threatened. Access to the community of Hemlock was restricted to residents only.

- August 17: The Siuslaw River Fire located 18 miles west of Veneta burned 840 acres. Cause of fire is unknown. Cost of suppression was $1.5 million.

1998

- Aug 13: An accidentally human-caused fire consumed 260 acres of timber on steep ridges along the North Fork of the Willamette River east of Road 19 near Huckleberry Flats in the High Prairie area. There was $100k in crop damage attributed to what was known as the Gorge fire.

1996

- A fire occurred in Oakridge two days after someone torched a pickup and spray-painted "Earth Liberation Front" and anti-logging messages on the walls of the Willamette National Forest's Detroit Ranger Station, east of Salem. (The Associated Press, 2000) The fire caused an estimated $9 million in damage to the ranger station.

- August 13: Lightning triggered 37 forest fires in the Willamette National Forest near Oakridge, Oregon. These fires, known as the **South Zone Complex**, burned 3700 acres and smoldered for 4 weeks before being declared out on September 9.

- August 24: Lightning caused a series of forest fires, known as the **Moolack Complex**, in the Willamette National Forest east of Oakridge. 11,375 acres were burned with $1.7 million in damage to campgrounds and timber interests. The fire smoldered for almost 2 months before it was declared out on October 16.

1991

- The **Warner Creek** Fire was set by an unknown arsonist on October 10, 1991. By the time it was controlled on October 27, it had burned 8,973 acres in the Oakridge Ranger District, at a cost of $10 million. The burned area lies north of State Highway 58, about 12 miles east of the City of Oakridge. The entire fire area lay within what was soon (January 1992) to be designated a Habitat Conservation Area (specifically, HCA 0-10), a designated management area primarily for Northern Spotted Owl habitat. It was the first large fire in a Spotted Owl HCA. (US Forest Service, Pacific Northwest Region, 1991)

1988

- A wind-whipped forest fire burned out of control in private and federal land southeast of Oakridge. The fire broke out in the Willamette National Forest and grew quickly in 20-40 mph winds. Authorities estimated at least 2,000 acres were blackened. Lane County sheriff's deputies warned residents in the Salt Creek (Polk County) drainage about six miles southeast of Oakridge to be ready to evacuate.

Other

- The Nelson Mountain Fire was one of many large fires in 1910 that burned most areas that are now state forest lands in western Lane County. Large fires burned again in western Lane County in 1917 and 1922. Then in 1929, a number of large fires burned most of the central Coast Range in Lane County, covering nearly 80,000 acres. The fires re-burned some previously burned areas, and burned green forest as well. With the timber gone, the Great Depression starting, and the land unsuitable for homesteading, many landowners allowed their land to revert to the county in place of back taxes. Lane County deeded its timberlands to the Board of Forestry in the mid-1940s. (Oregon Department of Forestry, 2010)

Probability of Future Events

The statewide average for Oregon counties experiencing a major wildfire is roughly once every four years. However, a major wildfire occurs somewhere in the state at least once per year.

Earthquake / Tsunami

In 2008 the Oregon Department of Geology and Mineral Industries (DOGAMI) published an extensive study on the primary geologic hazards of Yamhill, Marion, Polk, Benton, Linn and Lane Counties. Included in this report are earthquake and landslide hazard maps for each county along with future earthquake damage estimates. This study is called *Interpretive Map Series, IMS-24, Geologic Hazards, Earthquake and Landslide Hazard Maps, and Future Earthquake Damage Estimates.* Appendix C of the DOGAMI report is specific to Lane County and is therefore included in its entirety as an Addendum to this Natural Hazards Mitigation Plan Update.

Geographic Extent

A tsunami is a series of sea waves, usually caused by a displacement of the ocean floor by an undersea earthquake. As tsunamis enter shallow water near land, they increase in height and can cause great loss of life and property damage.

Recent research suggests that tsunamis have struck the Oregon coast on a regular basis. They can occur any time of day or night. Typical wave heights from tsunamis occurring in the Pacific Ocean over the last 500 years have been 20 – 65 feet at the shoreline. However, because of local conditions a few waves may have been much higher – as much as 100 feet.

We distinguish between a tsunami caused by an undersea earthquake near the Oregon coast (a local tsunami) and an undersea earthquake far away from the coast (a distant tsunami).

A local tsunami can come onshore within 15 to 20 minutes after the earthquake whereas a distant tsunami can take several hours. The worst case scenario for a distant tsunami for Lane County is one generated from Alaska.

Significant Events Since 2006

A devastating M9 earthquake struck off the coast of Japan at about 3:00 PM on Friday, March 11, 2011 – the time zone conversion made it 10:00 PM on Thursday, March 10, local time. As such, Thursday evening at 11:30 PM a tsunami watch was issued for the coastal areas of Oregon by the National Weather Service in Portland.
Friday morning at 12:44 AM the tsunami watch was updated to a warning:

> "This message updates the alert status to warning and advisory.
> ..A tsunami warning is now in effect which includes the coastal areas of California and Oregon from Point Conception California to the Oregon-Washington Border..."

The update from a tsunami watch to warning triggered the decision making process for when to invoke evacuation procedures. The areas to be evacuated were the coastal areas of Lane County inside the inundation zone as defined by the Oregon Department of Geology and Mineral Industries (DOGAMI). Tsunami wave arrival times for the central Oregon coast were predicted for 7:00 AM.

Fire Chief John Buchanan and Police Chief Maury Sanders monitored the impact of this distant tsunami on Hawaii along with NOAA information and made the official decision to evacuate the inundations zones at around 2:30 AM.

To ensure a smooth and safe evacuation effort and to discourage travel to the coast, resources were quickly mobilized from various agencies.

A full activation was invoked for the West Lane Emergency Operations Center (EOC) located at Siuslaw Valley Fire & Rescue in Florence. The Lane County Sheriff's Office located in downtown Eugene also initiated a Level Two (limited) EOC activation to provide support to the city. Communications between the two EOC's were frequent and effective resulting in excellent information flow going both ways. At all times the City of Florence and Siuslaw Valley Fire & Rescue were considered a Unified Command and the lead agencies for this incident.

A smooth and successful evacuation was accomplished as a direct result of years of tsunami preparedness planning, training and exercises sponsored by the West Lane Emergency Operations Group. Years of public education and outreach also proved effective as the majority of citizens were poised to follow instructions and evacuate according to plan. There was a segment of the population that was unaware of their location in proximity to the inundation zone and therefore created a spike in calls to the City of Florence.

There were three times at Heceta Beach when it was observed that the water was receding anywhere from 50 to 150 feet and then followed by a returning surge of water that would reach the original water level. The behavior of the water was as expected for on oncoming tsunami wave but stopped short of flooding the area. Surge times were 7:30 AM, 8:00 AM and 9:30 AM.

Previous Occurrences

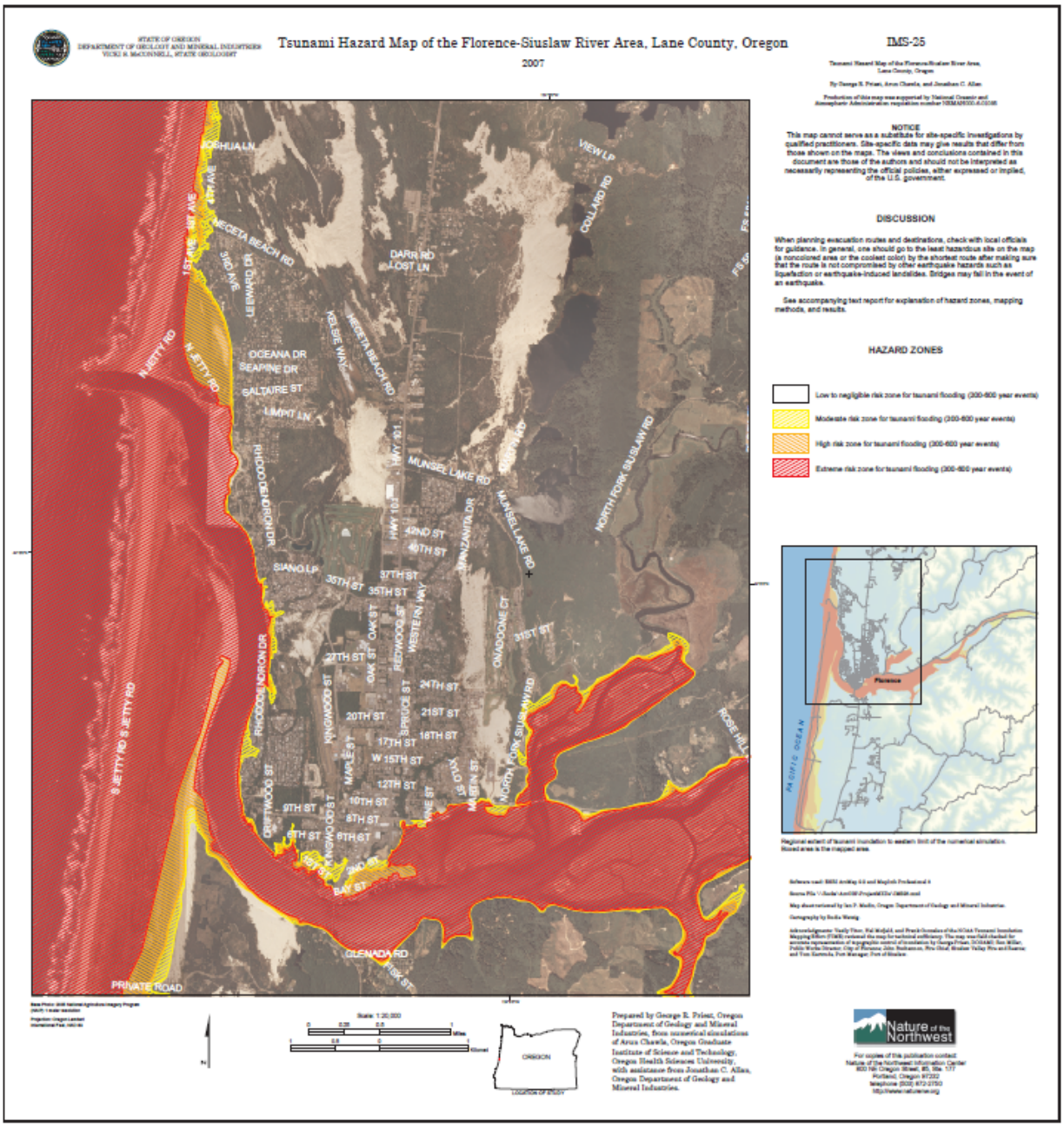
Tsunamis from locations across the Pacific Ocean basin and from the Cascadia Subduction Zone off the Washington coast have hit coastal communities in the 900 – 930 era, 1700, the 1890's, 1944-1953 era, 1949, 1960, 1964 and 1980.

Probability of Future Events

Great earthquakes in the Pacific Ocean basin generating tsunamis that impact Oregon's outer coast and the Strait of Juan de Fuca occur at a rate of about every six hundred years. A rate of occurrence for local earthquakes and landslides that generate tsunamis has not been determined

Figure 7. Location of the Cascadia Subduction Zone (CREW, 2003)

Figure 8. Map of the tsunami hazard area for Lane County Oregon as determined by the State of Oregon Department of Geology and Mineral Industries.



Landslide

In many parts Lane County, weathering and the decomposition of geologic materials produces conditions conducive to landslides. Although landslides are a natural geologic process, the incidence of landslides and their impacts on people can be exacerbated by human activities. Grading for road construction and development can increase slope steepness, decrease the stability of a hill slope (by adding weight to the top of the slope and removing support at the base of the slope), and increasing water content. For these reasons, landslides periodically affect county roadways, and response (debris removal), as well as slope stabilization are part of Lane County Public Work's routine work. Development coupled with natural processes such as heavy rainfall or rapid snowmelt can cause landslides or re-activate historical landslide sites.

Although much can be said generally about landslides in Lane County, a risk and vulnerability assessment needs to be formally conducted, documented and published to better understand the true nature of the hazard specific to Lane County.

In 2008 the Oregon Department of Geology and Mineral Industries (DOGAMI) published an extensive study on the primary geologic hazards of Yamhill, Marion, Polk, Benton, Linn and Lane Counties. Included in this report are earthquake and landslide hazard maps for each county along with future earthquake damage estimates. This study is called *Interpretive Map Series, IMS-24, Geologic Hazards, Earthquake and Landslide Hazard Maps, and Future Earthquake Damage Estimates.* Appendix C of the DOGAMI report is specific to Lane County and is therefore included in its entirety as an Addendum to this Natural Hazards Mitigation Plan Update.

Table 4. Summary Table of Significant Weather Events in Lane County. This table shows by year which type of severe weather event occurred and in which physiographic region.

Year	Snow / Ice Storm	Flood	Windstorm	Wildfire (at or near Lane County)	Landslide	Earth-quake	Distant Tsunami	Drought
2011	CSCD/R CSCD/F		CSCD/R CST		CST		CST	
2010	CSCD/R CSCD/F WVF		CSCD/F					
2009	CSCD/R		CSCD/R	CSCD/ R				
2008	CSCD/R CSCD/F WVF			CSCD/ R				
2007	CSCD/R CST/R	CST WVF	CSCD/R CSCD/F CST/R WVF					
2006	CSCD/R CSCD/F CST/R	CST WVF	CST WVF					
2005	CSCD/R CSCD/F WVF CST/R	CST WVF	WVF				CST	WVF
2004	CSCD/R CSCD/F WVF CST/R (DR 1510)		WVF (DR 1510)					
2003	CSCD/R CSCD/F WVF CST/R		CST		CST			
2002	CSCD/R CSCD/F CST/R		CST WVF (DR 1405)	CST/R				
2001	CSCD/R CSCD/F WVF CST/R		CST					
2000	CSCD/R							
1999	CSCD/R CSCD/F		WVF		CST			
1998	CSCD/R CSCD/F			CSCD/ R				
1997	CSCD/R CSCD/F WVF	CST WVF (DR 1160)						

	Snow / Ice Storm	Flood	Windstorm	Wildfire (at or near Lane County)	Landslide	Earth-quake	Distant Tsunami	Drought
1996	**CSCD/R CSCD/F WVF**	**CST WVF (DR 1099)**	**CST WVF (DR 1107)**	CSCD/ R				
1995	**CSCD/R**	WVF	WVF					
1994	**CSCD/R CST/R**		CST WVF					
1993	**CSCD/R WVF**		CST					
1992								
1991				CSCD/ R				
1990	WVF							
1989	CST WVF		WVF					
1988				CSCD/ R				
1987								
1986								
1985								
1984			WVF					
1983								
1982								
1981			WVF					
1974		**WVF (DR 413)**	WVF					
1972		**WVF (DR 319)**	WVF					
1971	WVF		WVF					
1969	WVF CST							
1968	WVF							
1964		**WVF (DR 184)**	WVF				CST	
1963			WVF					
1962			**WVF (DR 136)**					
1950	CSCD/R WVF							

Cst	Coast Region	Cscd/F	Cascade Foothills
Cst/R	Coast Range	Cscd/R	Cascade Range
WVF	Willamette Valley Floor	(DR XXX)	FEMA Disaster Declaration and Number

Hazard Analysis Scoring (Quantification)

This section discusses a scoring method that is used to assist with prioritizing hazards and understanding risk. It doesn't predict the occurrence of a particular hazard, but it does "quantify" the risk of one hazard compared with another. By doing this analysis, planning can first be focused where the risk is greatest. Among other things, this hazard analysis can:

- help establish priorities for planning, capability development, and hazard mitigation;
- serve as a tool in the identification of hazard mitigation measures;
- be one tool in conducting a hazard-based needs analysis;
- serve to educate the public and public officials about hazards and vulnerabilities;
- help communities make objective judgments about acceptable risk.

For Lane County, this analysis allows comparison of the same hazard across various local jurisdictions; for example, the score for the windstorm or earthquake in central Lane County will differ from the score in coastal Lane County. Therefore, two hazard analyses are produced for Lane County due to the diversity of Lane County's geography.

The methodology was first developed by the Federal Emergency Management Agency (FEMA) circa 1983, and gradually refined by Oregon Emergency Management (OEM) over the years.

The methodology produces scores that range from 24 (lowest possible) to 240 (highest possible). By applying one order of magnitude from lowest to highest, a hazard with a score of 240 is considered ten times more severe than a hazard with a rating of 24.

Vulnerability and probability are the two key components of the methodology. Vulnerability examines both typical and maximum credible events, and probability endeavors to reflect how physical changes in the jurisdiction and scientific research modify the historical record for each hazard. Vulnerability accounts for approximately 60% of the total score, and probability approximately 40%.

In connection with Emergency Management Performance Grant funding administered by OEM, there is a requirement that hazard analyses must be current and updated within the past ten years, and include a written synopsis (narrative) of the most credible events possible to occur within a jurisdiction. Having a current local hazard analysis is also one element in meeting Oregon Progress Board Benchmark #67, "Emergency Preparedness."

In this analysis, severity ratings are applied to the four categories of history, vulnerability, maximum threat (worst-case scenario), and probability based as follows:

LOW = choose the most appropriate number between 1 to 3 points
MEDIUM = choose the most appropriate number between 4 to 7 points
HIGH = choose the most appropriate number between 8 to 10 points

Weight factors also apply to each of the four categories as shown below.

History (weight factor for category = 2)
History is the record of previous occurrences. Events to include in assessing history of a hazard event for which the following types of activities were required:

- The EOC or alternate EOC was activated;
- Three or more EOP functions were implemented, e.g., alert & warning, evacuation, shelter, etc.
- An extraordinary multi-jurisdictional response was required; and/or
- A "Local Emergency" was declared.

LOW – score at 1 to 3 points based on… 0 - 1 event past 100 years
MEDIUM – score at 4 to 7 points based on… 2 - 3 events past100 years
HIGH – score at 8 to 10 points based on… 4 + events past100 years

Vulnerability (weight factor for category = 5)
Vulnerability is the percentage of population and property likely to be affected under an "average" occurrence of the hazard.

LOW – score at 1 to 3 points based on… < 1% affected
MEDIUM – score at 4 to 7 points based on… 1 - 10% affected
HIGH – score at 8 to 10 points based on… > 10% affected

Maximum Threat (weight factor for category = 10)
Maximum threat is the highest percentage of population and property that could be impacted under a worst-case scenario.

LOW – score at 1 to 3 points based on… < 5% affected
MEDIUM – score at 4 to 7 points based on… 5 - 25% affected
HIGH – score at 8 to 10 points based on… > 25% affected

Probability (weight factor for category = 7)
Probability is the likelihood of future occurrence within a specified period of time.

LOW – score at 1 to 3 points based on… one incident likely within 75 to 100 years
MEDIUM – score at 4 to 7 points based on… one incident likely within 35 to 75 years
HIGH – score at 8 to 10 points based on… one incident likely within 10 to 35 years

By multiplying the *weight factors* associated with the categories by the *severity ratings*, we can arrive at a subscore for history, vulnerability, maximum threat, and probability for each hazard. Adding the subscores will produce a total score for each hazard.
The total score isn't as important as how it compares with the total scores for other hazards in Lane County. By comparing scores, we can determine priorities: Which hazards should the jurisdiction be most concerned about? Which ones less so?

Table 5. Lane County – Central. This table summarizes the score for each hazard in central Lane County.

HAZARD	HISTORY WF=2	VULNERABILITY WF=5	MAXIMUM THREAT WF=10	PROBABILITY WF=7	TOTAL
Snow/Ice Storm	10 x 2 = 20	10 x 5= 50	10 x 10 =100	10 x 7 = 70	240
Flood	10 x 2 = 20	7 x 5 = 35	5 x 10 = 50	8 x 7 = 56	161
Windstorm	10 x 2 = 20	4 x 5 = 20	4 x 10 = 40	10 x 7 = 70	150
Wildfire	10 x 2 = 20	5 x 5 = 25	5 x 10 = 50	8 x 7 = 56	131
Domestic Terrorism	9 x 2 = 18	3 x 5 = 15	4 x 10 = 40	8 x 7 = 56	129
Landslide	8 x 2 = 16	2 x 5 = 10	5 x 10 = 50	4 x 7 = 28	104
HazMat Incident	10 x 2 = 20	2 x 5 = 10	1 x 10 = 10	8 x 7 = 56	96
Earthquake	8 x 2 = 16	4 x 5 = 20	4 x 10 = 40	2 x 7 = 14	90
Volcano	1 x 2 = 2	4 x 5 = 20	3 x 10 = 30	1 x 7 = 7	59

Table 6. Lane County – Coastal. This table summarizes the score for each hazard in coastal Lane County.

HAZARD	HISTORY WF=2	VULNERABILITY WF=5	MAXIMUM THREAT WF=10	PROBABILITY WF=7	TOTAL
Windstorm	0 x 2 = 20	10 x 5 = 50	10 x 10 = 100	10 x 7 = 70	240
Earthquake/Tsunami	0 x 2 = 0	7 x 5 = 35	10 x 10 = 100	4 x 7 = 28	191
Flood	10 x 2 = 20	7 x 5 = 35	5 x 10 = 50	8 x 7 = 56	161
Snow/Ice Storm	1 x 2 = 2	1 x 5 = 5	4 x 10 = 40	1 x 7 = 7	57
Domestic Terrorism	6 x 2 = 12	3 x 5 = 15	4 x 10 = 40	7 x 7 = 49	116
Landslide	8 x 2 = 16	5 x 5 = 25	6 x 10 = 60	10 x 7 = 70	171
HazMat Incident	10 x 2 = 20	2 x 5 = 10	1 x 10 = 10	8 x 7 = 56	96
Wildfire	1 x 2 = 2	2 x 5 = 10	2 x 10 = 20	2 x 7 = 14	46

Updated Mitigation Strategy

This section describes Lane County's blueprint for reducing the potential losses identified in the risk assessment and is based on existing authorities, policies, programs and resources, and its ability to expand on and improve these existing tools.

The goals for the 2006 edition of Lane County's Natural Hazards Mitigation Plan are still relevant today and are central to this Plan Update. The goals focus on reducing or avoiding long-term vulnerabilities to hazards in Lane County:

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

A key component of the Mitigation Strategy is the implementation of preventive measures in community planning as a means for accomplishing the Plan goals.

Preventive Measures in Community Planning

The State of Oregon uses a unique but legally powerful system of statewide planning goals that must be addressed in local plans, including a state goal related to natural hazards. Its planning goals and guidelines are established by the Oregon Department of Land Conservation (DLCD), which reviews plans and oversees compliance. Natural hazard areas are the subject of Goal 7; they include floods, earthquakes, landslides, tsunamis, coastal erosion and wildfires. Over the years, DLCD has published significant guidance for local governments addressing planning and mitigation options for each of these hazards. It also notifies local governments when relevant new hazard information requires a local planning response, which must occur within three years (Schwab 2004). Response includes evaluating the risk based on the new information and adopting or amending plan policies and measures to avoid both development and the siting of essential facilities in hazard areas. (American Planning Association, 2010)

Lane County's uses its Comprehensive Plan as the overarching plan that possesses the legal standing as a reference point for local land-development regulations. The

Comprehensive Plan includes a hazards / safety element that can be reinforced in community plans and programs such as this Natural Hazards Mitigation Plan.

In addition to the Comprehensive Plan, Lane County has several means for implementing preventive measures to protect new construction from hazards and to see that future development does not create unintended consequences in the form of hazardous conditions or economic loss. There are several ordinances in Lane Code that assist with achieving hazard mitigation through these types of preventive measures. Lane County Public Works, Land Management Division administers these preventive measures through (list not exhaustive):

- National Flood Insurance Program
- Building Codes
- Planning and Zoning
- Land Divisions
- Parks and Open Space

National Flood Insurance Program

In 1968, Congress passed the National Flood Insurance Act based on findings that: "(1) a program of flood insurance can promote the public interest by providing appropriate protection against the perils of flood losses and encouraging sound land use by minimizing exposure of property to flood losses; and (2) the objectives of a flood insurance program should be integrally related to a unified national program for floodplain management."

The Flood Insurance Act is administered through the National Flood Insurance Program, (NFIP). The NFIP is a voluntary program that is based upon cooperative agreements between the federal government and local participating communities. The NFIP enables property owners within participating communities to purchase flood insurance at a reasonable cost and helps to provide an insurance alternative to the rising costs of federal flood disaster relief. In return, participating communities must properly manage their floodplains by adopting and enforcing floodplain management ordinances aimed at reducing the likelihood of future flood damage to new construction.

Since 1970, Lane County has been a participating member of the NFIP. The Land Management Division is responsible for administering the day-to-day activities of the county's floodplain program, which are extensive. Specifically, the Land Management Division:

- Maintains and administers Lane County's floodplain regulations
- Reviews and issues floodplain development permits

- Maintains elevation certificates for all new and substantially improved structures (and also maintains an extensive database of historic elevation certificates)
- Ensures that encroachments do not occur within the regulated floodway
- Implements measures to ensure that new and substantially improved structures are protected from flood losses
- Maintains floodplain studies and maps and makes this information available to the public
- Maintains a flood information website with digital flood insurance rate map (DFIRM) data
- Conducts site visits to assess floodplain hazards and provides technical assistance to the public
- Maintains a library of historical flood related information
- Informs the public of flood insurance requirements
- Conducts annual outreach and training about flood hazards and development within the floodplain

NFIP - Community Rating System

In 1990, the National Flood Insurance Program's Community Rating System (CRS) was implemented. The CRS is sub-program within the NFIP that recognizes and encourages community floodplain management practices that exceed the minimum NFIP standards.

Under the CRS, flood insurance premium rates are lowered to reflect the reduced flood risk resulting from community activities that meet the objectives of the CRS: Those objectives are:

(1) Reduce flood losses, i.e.,
- protect public health and safety,
- reduce damage to buildings and contents,
- prevent increases in flood damage from new construction,
- reduce the risk of erosion damage, and
- protect natural and beneficial floodplain functions.

(2) Facilitate accurate insurance rating; and

(3) Promote the awareness of flood insurance.

As part of the Lane County Land Management Division's 2007 Long Range Planning Work Program, staff was formally directed to take actions necessary for the county to gain admittance into the CRS. Prior to submitting an application, LMD was first required by FEMA to process updates to the county's floodplain ordinances (LC 16.244 and LC 10.2.71) and to take measures necessary to address Lane County's repetitive flood loss properties. These activities were carried out during 2007 and on March 3, 2008 Lane County's CRS application and accompanying documentation was submitted to FEMA for formal review.

On July 2, 2009, Lane County received official notification of admission into the CRS with community rating of "7". For the past 3 years Lane County has maintained its standing in the CRS and is committed to continued NFIP compliance.

Building Codes

Building codes provide one of the best methods of addressing most of the hazards in this plan. They are the primary means for protecting new property from damage by snow / ice storms, flood, windstorms, landslides and earthquakes. When properly designed and constructed according to code, the average building can withstand the impacts of most of these forces.

The mission of Lane County's Building Program is to protect public safety, health and welfare wherever hazards associated with the design, erection, repair, removal, demolition or occupancy of structures have the potential to exist within the county's jurisdiction. The Building Program endeavors to fulfill this mission through efficient, professional, and equitable administration of nationally recognized code standards and local regulations.

Code administration, which is enforcement of code standards, is very important. Adequate inspections are needed during the course of construction to ensure that the builder understands and implements the requirements. The Building Code Effectiveness Grading Schedule (BCEGS) is a national program used by the insurance industry to determine how well new construction is protected from wind, earthquake and other non-flood hazards. Building permit programs are reviewed and scored, a class 1 community is the best, and a class 10 communities has little or no program. Lane County has a BCEGS classification of 4 for residential and 3 for commercial.

The building codes in use by Lane County are as follows:

Commercial Building Codes:

- 2010 Oregon Structural Specialty Code (OSSC): 2009 International Building Code (IBC) w/ 2010 Oregon Amendments
- 2010 Oregon Mechanical Specialty Code (OMSC): 2009 International Mechanical Code (IMC) and 2009 International Fuel Gas Code (IFGC) w/ 2010 Oregon Amendments
- 2008 Oregon Plumbing Specialty Code (OPSC): 2006 Uniform Plumbing Code (UPC) w/ 2008 Oregon Amendments

- 2010 Oregon Fire Code (OFC): 2009 International Fire Code (IFC) w/ 2010 Oregon Amendments
- 2008 Oregon Electrical Specialty Code (OESC): 2008 National Electric Code (NEC) w/ 2008 Oregon Amendments
- 2010 Oregon Energy Efficiency Specialty Code (OEESC): 2009 International Energy Conservation Code (IECC) w/ 2010 Oregon Amendments

Residential Building Codes:

- 2008 Oregon Residential Specialty Code (ORSC): 2006 International Residential Code (IRC) w/ 2008 Oregon Amendments
- 2008 Oregon Electrical Specialty Code (OESC): 2008 National Electric Code (NEC) w/ 2008 Oregon Amendments
- 2008 Oregon Plumbing Specialty Code (OPSC): 2006 Uniform Plumbing Code (UPC) w/ 2008 Oregon Amendments
- 2010 Oregon Manufactured Dwelling Installation Specialty Code (OMDISC)
- 2010 Oregon Energy Efficiency Specialty Code (OEESC): 2009 International Energy Conservation Code (IECC) w/ 2010 Oregon Amendments

Planning and Zoning

Lane County has several combining zones outlined in Lane Code that help direct development away from hazardous areas by designating land uses that are more compatible to the natural conditions of the land. Among other things, these types of zoning regulations help mitigate natural hazards.

Natural Resources Conservation Combining District (Lane Code 10.250)

Natural Hazard Mitigation includes preserving protective features such as wetlands, estuarine marshes and floodplains. Protecting natural resources meets multiple objectives: preserves habitat, protects the environment and limits development in hazardous areas.

Lane County's Natural Resources Conservation Combining District applies to coastal area shorelands identified in inventory information as timber lands, agricultural lands or shorelands in dune areas. It is the purpose of the NRC District to encourage long-term human use of these coastal resources in a

manner which protects the qualities of coastal water bodies and respects the natural systems. Activities which protect or enhance renewable resources are encouraged, as are recreation and public access to coastal waters.

Shorelands Mixed Development Combining Zone (Lane Code 16.241)

The Shorelands Mixed Development Combining Zone applies to coastal shore lands committed to commercial and industrial uses in proximity to the dredged channel of the Siuslaw River. Lane Code dictates that these shore lands be preserved for the expansion of existing water-dependent and water-related commercial or industrial uses. Part of the reason for doing this is to avoid geologic and hydrologic hazards and to avoid hazard to life or property.

Beaches and Dunes Combining Zone (Lane Code 16.243)

The Beaches and Dunes Combining Zone requires the completion of a Development Hazards Checklist as the initial screening process for any development proposed for Beach and Dune areas.

The Development Hazards Checklist is used to indicate certain potential hazards associated with the particular landform proposed for development including hazards associated with adjacent sites. The checklist screens for adequate protection against soil erosion from wind and surface water runoff as well as possible fire hazard or slide potential based on the existing site vegetation.

Floodplain Combining Zone (Lane Code 16.244)

The Floodplain Combining Zone outlines methods for reducing flood losses, clarifies to which lands the code applies, and specifies provisions for flood hazard reduction pertaining to foundations and anchoring, utilities, elevation for residential and non-residential structures, elevation of manufactured homes, elevation of recreational vehicles, enclosed areas, roads and subdivisions and partitions.

Specifically, Lane Code 16.244 (applicable to rural areas) and, 10.271 (applicable to areas within the Urban Growth Boundary) requires that all permit applications be reviewed to determine whether the proposed development site will be reasonably safe from flooding. If a proposed development site is in a flood hazard area, all site development activities (including grading, filling, utility installation and drainage modification), all new construction and substantial improvements (including the placement of prefabricated buildings and manufactured homes) are required to be constructed with methods, practices and materials that minimize flood damage.

Community Wildfire Protection Plan (CWPP)

Recent fires in Oregon and across the western United States have increased public awareness of the potential losses to life, property, and natural and cultural resources. In July of 2005, the Lane County Commissioners directed the County Departments to work with state and federal agencies, fire protection districts, and community organizations throughout the County to develop an integrated wildfire plan. The Commissioners initiated this effort to reduce wildfire risk to citizens, the environment, and quality of life within Lane County. The Lane County Community Wildfire Protection Plan provides a guide for taking a more wildfire-based approach in managing our forestlands. The Lane County CWPP also assists the county in being more competitive for federal funding programs such as the Healthy Forests Restoration Act, the National Fire Plan, and the Federal Emergency Management Agency's (FEMA) Pre-Disaster Mitigation Program.

Lane County Firewise Incentive Program

In 2009, Lane County adopted policies in Lane Manual Chapter 4.3 to establish a grant incentive program designed to mitigate the risk of wildfire to rural residents.

The mission of the Lane County Firewise Incentive Program is *to promote home construction and landscaping techniques that will prevent fatalities, injuries, property loss and environmental damage resulting from wildfires.*

To help achieve this mission the program provides funding to partially or wholly reimburse the costs that rural home owners incur for certain types of home and landscaping improvements. These improvements are promoted by the National Firewise Communities Program[6] and if implemented properly have been shown to reduce the probability that a home will be damaged or destroyed in a wildfire.

Currently, grants are offered for the following types of improvements:

1. Replacement of a wood shake roof with a roof consisting of a Class-A covering or Class-A assembly (80% of costs up to $4,000)
2. Installation of non-combustible exterior siding (80% of costs up to $4,000)
3. Installation of fire resistant (and energy efficient) exterior windows and skylights made from tempered glass, multi layered glazed panels or glass block (80% of costs up to $1,500)
4. Installation of non-combustible exterior doors (80% of costs up to $300)
5. Installation of spark arrestors on chimneys ($100)

[6] The National Firewise Communities Program is an interagency effort designed to encourage local solutions for wildfire safety by involving homeowners, planners, community leaders, developers, firefighters and others in an effort to protect people and property from the risk of wildfire – before a fire starts. The Firewise approach focuses on planning, landscaping, construction, and home maintenance to help protect people, property, and natural resources. Additional information about the National Firewise Communities Program can be found at: www.firewise.org.

6. Installation of mesh screening on exterior ventilation or deck openings that will prevent the entry of firebrands and the accumulation of flammable debris ($100)
7. Landscaping improvements that will create a defensible space around habitable structures. Under this category funding is available for brush removal, tree pruning, chipping and the planting of approved fire-resistant plants within a 30' buffer around homes (up to $1,000 depending on site specific conditions)

To date, the program has dispersed over $700,000 to property owners living in at risk areas.

Land Divisions

Lane Code 13.050 stipulates that any area determined to be dangerous for road or building development by reasons of geological conditions, unstable subsurface conditions, groundwater or seepage conditions, floodplain, inundation or erosion or any other dangerous condition shall not be divided or used for development except under special considerations and restriction. Special consideration and restriction shall consist of a detailed report by a professional engineer stating the nature and extent of the hazard and recommending means of protecting life and property from the potential hazard and/or the County shall impose limitations designed to minimize the known danger on development commensurate with the degree of hazard.

Parks and Open Space

Keeping the floodplain and other hazardous areas open and free from development is effective for preventing damage to new developments.

Lane County has preserved approximately 31,520 acres in the Severe Flood Hazard Area (SFHA) as open space with additional land preserved in a natural state.

Although natural hazard mitigation is not an explicitly stated goal in Lane County's Parks & Open Space Master Plan, Lane County owns or maintains 73 parks totaling over 4300 acres. Approximately 85% of the parks are located in a floodplain combining zone which naturally contributes to flood hazard mitigation.

2006 Action Item Update Overview

The action items for the Natural Hazards Mitigation Plan were established by the committee in 2006. This section of the Plan Update provides a comprehensive review of the progress made on each of the action items. The action item status indicates if the action item has been completed, ongoing or removed from the plan. In addition, it will indicate whether the action item will be rewritten for the Plan Update.

The comprehensive plan review identified several problems with the original crafting of the action items.

- Action items were written for every type of hazard resulting in a significant amount of redundancy and overlap among the action items. In other words, one type of action item applied to many hazards and was, in essence, repeated multiple times.
- The hazards were not prioritized prior to creating the action items;
- Some action items were assigned to agencies that were not adopters of the plan and some agencies were not at the table at the time the action items were created.
- The action items did not address all of the county departments that have a role in hazard mitigation.

The Plan Update adopts a new structure for the action items. A more strategic approach will be used that allows more flexibility for achieving the intent of the action item. New funding opportunities and disasters occurring elsewhere that create a local sense of urgency can both be motivating factors for accelerating the accomplishment of an action item's intent in unanticipated ways. Therefore the Plan Update uses a broader definition for each Action Item to encourage continuous reflection and contemplation about the wide range of things that can be done to reduce hazards and to encourage more frequent status updates on each action item. Additionally, a shorter list of broad reaching action items makes it easier to keep the list of action items in front of county agencies and the public as constant reminders that we all need to do our part. Another benefit to this approach is that it makes the county's Plan easier for cities and the local tribe to adopt. The action items could apply to all jurisdictions and with the addition of just a few jurisdiction-specific action items a small city or tribe could be on its way to implementing its own Natural Hazards Mitigation Plan.

2006 Item-by-Item Analysis

A. Action Item No: MH #1 Amended Item No: 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."

Status Update:

Various sub-committees met periodically to implement hazard mitigation projects and to secure funding opportunities. This will continue to be ongoing and improved upon during the next plan performance period.

However, sustaining the NHMP, CWPP and EOP as a single integrated effort is not feasible. Although the intent is to ensure that elements of the NHMP are integrated into and coordinated with other plans, various staff members and departments work on these plans at different times based on department priorities and work plans therefore sustaining them as a single integrated effort is impracticable. However, incorporating mitigation action items into other planning mechanisms as appropriate is reasonable and attainable.

- **This item is rewritten as follows:** Establish Mitigation Coordinating Committee to act as a forum for hazard mitigation issues, disseminate hazard mitigation ideas and activities to all participants, monitor implementation of the Action Items and report on progress and recommended changes to the Plan as appropriate. Includes identifying opportunities to incorporate mitigation actions into other planning mechanisms, such as comprehensive or capital improvements, as appropriate.

B. Action Item No's: MH #2, MH #3, MH #4, EH #1, WH #2, WH #4, WH #5, WH #7, LH #1

Amended Item No: 2

All of the items listed above pertain to some type of public education activity with some degree of overlap. Public education and outreach programs are an effective strategy for orienting community members to family preparedness and property protection measures. Every type of hazard should be mitigated in part through public outreach programs. To more broadly represent the many ways this gets accomplished, the 2011 Plan Update moves away from individual detailed activities to a more strategic approach

to public outreach in general. As such, these individual action items will be replaced with a broader, overarching public outreach action item as rewritten below.

- **This item is rewritten as follows:** Conduct public outreach activities related to natural hazard mitigation and personal preparedness using a variety of media sponsored by various agencies, such as:

    - Community newsletters and direct mailings
    - News releases and public service announcements
    - Presentations at meetings of neighborhood, civic or business groups
    - Displays in public buildings or shopping malls
    - Signs in parks, along trails and on waterfronts that explain natural features (such as the river or ocean) and their relation to hazards (such as floods)
    - Brochures available in government buildings
    - Special meetings

Status Update:

The intent of these action items is to carry out effective public education and outreach activities. These have been achieved in many different venues by various agencies from speaking engagements, public mailers, website updates, etc. A sample listing of many of those activities is provided below.

- Lane County Emergency Management delivers on average 8 public education presentations a year and is a regular guest on radio talk shows.
- Lane County has several departmental websites that help community members reduce various types of hazard risk
- According to a recent survey of fire service agencies in Lane County, 91% of agencies provide some form of information on how to reduce fire risk to the community.

C. Action Item No: MH #5 Amended Item No: 3

"Provide HAZUS training opportunities for County Staff (Lane County Public Works GIS technicians)."

Status Update:

The HAZUS software has been obtained from FEMA and training classes identified. However, there is a cost associated with staff attending the training and learning the software, therefore this action item is currently cost prohibitive due to shrinking budgets and decreasing staff resources. However, Lane County Emergency Management and Lane County Public Works have entered into a Memorandum of Understanding that

allows Emergency Management to contract with Public Works on an ad-hoc basis to help cover some of the costs of Emergency Management related projects; training on HAZUS software could be one of those projects. If Lane County GIS technicians are trained in HAZUS then they will be able to create maps to inform decision makers about viable risk reduction measures.
This action item will remain in the plan as on-going but rewritten for better clarity.

- **This item is rewritten as follows:** Develop in-house competency with HAZUS software so that additional loss-estimation data can be provided regarding natural hazard risks and inform decisions about potential risk reduction measures.

D. Action Item No: MH #6, MH #9, LH #2, LH #4, VH #4, DH #3, HMH #3

Amended Item No: 4

All of the action items listed above relate to mapping and overlap in their pertinence to mapping hazardous areas or creating a regional repository for hazard data. Maps, particularly digitized maps using a Geographical Information System, are a major component of effective hazard mitigation. Maps can illustrate the hazard vulnerabilities of specific areas and inform planners and policy makers on important decisions. As such, these individual action items will be replaced with two action items: one overarching mapping action item that has broader application and the second that focuses on locating critical facilities within hazardous areas.

Status Update:

One idea for implementation was to "Create and maintain a single server/location that regional users can access for accurate GIS data. This is especially important for Land Management when issuing building permits or analyzing development proposals."

Although there is regional agreement about the benefits of a centralized location for storing map related metadata, the county and most cities opt to maintain their own data. Achieving a single, regional location for accessing accurate GIS data is not a high priority for agencies facing shrinking budgets and decreasing staff resources. A regional repository would require dedicated staff to locate, update, create and maintain metadata on an on-going basis. Lane Council of Governments has twice applied for grant funding for this project but funding was not awarded. This project is repeated each year in Lane Council of Government's annual list of top five projects but remains unfunded.

Nonetheless, a major accomplishment was achieved toward the intent of this action item: the creation of a GIS Data Catalog: List of Available Data. Although this falls short of the more comprehensive idea described above, it was an achievable alternative with significant benefit. The data catalog informs plan developers of the data available for producing maps and thereby encourages better analysis of key decisions.

With regard to digitizing existing maps, two circa 1980 maps depicting the U.S. Army Corps of Engineers' inundation zones in the event of a catastrophic failure of either Hills Creek or Look Out Point dams have been digitized for evacuation planning purposes.

- **This item is rewritten as follows:**
  - Develop a list of hazard types to be mapped; identify, locate and obtain the necessary data and create hazardous area maps.
  - Plot critical facilities and infrastructure on the hazardous area maps to show their location within the hazard areas.

E. Action Item No: MH #7 Amended Item No: 5

"Expand existing special needs population data to include detailed inventory of all at-risk communities (elderly, homeless, disabled, etc.) that are without access to transportation and communication and determine mechanisms for alert/ warning and evacuation."

Status Update:

Currently this action item is considered unfeasible because of the staff time to create and maintain an inventory database of this kind. However, an alternative implementation was pursued that focuses on providing information to the agencies that serve the at-risk communities so they can, in turn, address their clientele's needs for transportation and communication.

- **This action item will remain in the plan as-is in case the opportunity emerges to complete this item. Outreach to agencies serving at-risk populations will be on-going and covered under the public outreach programs.**

F. Action Item No: MH #8 Amended Item No: 6

"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."

Status Update:

As a component of the Lane County Land Management Division's 2009-2010 Long-Range Planning Work Program, staff was directed to initiate a process to develop proposed amendments to the floodplain regulations of Lane Code Chapters 10.271 and 16.244. In addition, staff was directed to work with a Technical Advisory Committee to

develop a “Drinking Water Protection Overlay Zone” for possible adoption by the Lane County Board of Commissioners.

These proposed code amendments were designed to achieve the following objectives:

- Protect human life, health and property.
- Minimize the potential for contamination to surface and ground waters
- Manage the alteration of flood hazard areas to minimize the immediate and cumulative impacts of development on the natural and beneficial functions of the floodplain.
- Minimize expenditure of public money on costly pollution remediation projects and emergency response operations.

On November 4, 2010 the Lane County Planning Commission voted 6-3 to cancel the public hearing on this matter and postpone indefinitely the process to review proposed floodplain regulations and a proposed drinking water overlay zone. This action followed the Lane County Board of Commissioners 3-2 vote earlier that same week to table the proposed ordinances and process.

The action by both the Board and Planning Commission ended the process and public hearings on the proposed floodplain and drinking water protection ordinances. The decisions by the two bodies were reached following significant public comment and concern about the matter.

Nonetheless, the Planning Commission voted to recommend that the Board of Commissioners prioritize the work on floodplain and drinking water regulations and put them on the Land Management Division’s long-range planning work program for consideration in the future.

- **This action item will remain in the plan as on-going since it pertains to any type of hazard that could be mitigated through zoning.**

G. Action Item No's: EH #2, EH #3, EH #4
Amended Item No: N/A – Item Completed

All of the above action items relate to earthquake mitigation:

EH 2: Develop an inventory of public and commercial buildings that may be particularly vulnerable to earthquake damage;

EH 3: Complete Rapid Visual Assessments to analyze seismic vulnerability of public facilities.

EH 4: Develop and implement projects for highest priority facilities from EH 3.

Status Update:

These action items were essentially completed as a function of Oregon Senate Bill 2 (2005) Statewide Seismic Needs Assessment Using Rapid Visual Screening. Senate Bill 2 (2005) directed DOGAMI, in consultation with project partners, to develop a statewide seismic needs assessment, including seismic safety surveys of: K-12 public school buildings and community college buildings that have a capacity of 250 or more persons, hospital buildings with acute inpatient care facilities, fire stations, police stations, sheriffs' offices and other law enforcement agency buildings. Lane County has a copy of the report showing the results of facility assessments conducted in Lane County: Implementation of 2005 Senate Bill 2 Relating to Public Safety, Seismic Safety and Seismic Rehabilitation of Public Buildings; the report is available for viewing or download at:

www.http://blog.oregonlive.com/oregonianspecial/DOGAMI-SNA-05-22-07.pdf

Assessment of commercial buildings (EH 2) is outside the jurisdiction of the county or state and implementation of seismic rehabilitation projects (EH 4) is the responsibility of each individual agency.
The statewide needs assessment consists of rapid visual screenings (RVS) of these buildings in accordance with FEMA-154, 2002 Edition, or an equivalent standard adopted by DOGAMI; information gathering to supplement RVS; and ranking of RVS results into risk categories. Senate Bill 2 (2005) provides the first step in a pre-disaster mitigation strategy that is further defined in Senate Bills 3-5 (2005). Senate Bill 3 (2005) directs the Oregon Emergency Management office to create a grant program for local communities. Senate Bills 4 (2005) and 5 (2005) direct the state treasurer to issue voter approved bonds. Altogether, $1.2 billion will be appropriated to improve seismic safety statewide. Note that grant funding for seismic rehabilitation is directly related to seismic needs assessment.

- **This action item will be removed from the 2011 Plan Update because it has been completed.**

H. Action Item No: EH #5 Amended Item No: 7

"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."

Status Update
Lane County Emergency Management created a best practices guide, Best Practices, Responding to Distant Tsunami Warning for the coastal counties in Oregon with input from those counties (see Appendix F).

This action item will be on-going but rewritten to reflect the broader need for continued Tsunami preparedness.

- **This item is rewritten as follows:** Continuously examine opportunities to improve response to distant tsunami warnings and a coastal earthquake generating a tsunami. Implement measures as feasible.

I. Action Item No. FH #1
Amended Item No: N/A – Item Completed

"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."

Status Update

This item has been completed. Digital floodplain maps are accessible on the County's website using the County's Zone and Plan Map Viewer. The Zone and Plan Map Viewer is an interactive, web browser-based map tool that allows users to look up their property, zoom in and out, pan and turn on and off several different layers of map information related to planning and zoning.

- **This action item will be removed from the 20110 Plan Update because it has been completed.**

J. Action Item No. FH #3
Amended Item No: N/A – Action Completed

"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."

Status Update

This item was completed however, it was for an area along the McKenzie River (not the Willamette).

Community members were invited to a meeting in September 2010 sponsored by the Lane County Sheriff's Office, Emergency Management Division to discuss flood warning services on the lower McKenzie River. National Weather Service representative, Andy Bryant, was there to guide the community through a discussion about past flooding along the lower McKenzie and how we could improve flood warning services for that area. Based on information from the February 1996 flood and information learned at the meeting from local residents about more recent high water events, a flood stage level was established at the Walterville gage to better reflect actual conditions observed on the ground to the flood-affected area.

In addition, the National Weather Service implemented an intermediary flood level for the Mohawk and Siuslaw Rivers in Lane County. Previously only two warning levels had been defined: Flood Stage (minor flood) and Major Flood. For the Mohawk and Siuslaw rivers there is a relatively big difference (in feet) between flood stage and major flood. Therefore the National Weather Service added an in-between level, called "Moderate Flood" to enhance flood warning services:

Mohawk River-Springfield Flood Stage = 15' Moderate Flood = 22' Major Flood = 25'
Siuslaw River- Mapleton Flood Stage = 18' Moderate Flood = 22' Major Flood = 28'

- **This action item will be removed from the 2011 Plan Update because it has been completed.**

K. Action Item No. FH #4
Amended Item No: N/A – Action Completed

"Complete the inventory of locations in Lane County subject to frequent storm water flooding."

Status Update:

This action item has been completed. A copy of the inventory of high water locations and their mapped location can be found in Appendix G.

- **This action item will be removed from the 2011 Plan Update because it has been completed.**

L. Action Item No. FH #5 Amended Item No: 8

"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."

Status Update:

A tour of high water locations was completed in August 2010 by Emergency Management, Public Works Road Maintenance and a State mitigation contractor. A report was produced outlining the costs associated with remediating problematic areas. The inability to fund these types of major projects is the primary obstacle for completion.

- **This action item will remain in the 2011 Plan Update as on-going but low priority for funding. It is unlikely that projects will be completed from year to year on this action item.**

M. Action Item No. FH #6
Amended Item No: N/A – Action Completed

"Explore the potential for Lane County to participate in the Community Rating System (CRS) of the National Flood Insurance Program (NFIP)."

Status Update:

This action item has been completed. As part of the Lane County Land Management Division's 2007 Long Range Planning Work Program, staff was formally directed to take actions necessary for the county to gain admittance into the CRS. Prior to submitting an application, LMD was first required by FEMA to process updates to the county's floodplain ordinances (LC 16.244 and LC 10.2.71) and to take measures necessary to address Lane County's repetitive flood loss properties. These activities were carried out during 2007 and on March 3, 2008 Lane County's CRS application and accompanying documentation was submitted to FEMA for formal review.

On July 2, 2009, Lane County received official notification of admission into the CRS.

- **This action item will be removed from the 2011 Plan Update because it has been completed.**

N. Action Item No. WH #1, WH #8

Amended Item No: N/A – Action Completed

"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."

"Develop a hazardous tree inventory for all County properties"

Status Update

These action items are somewhat misguided and unnecessary. According to a recent survey of utilities in the county, tree pruning is a primary measure they perform on a regular basis to maintain reliability. Survey comments include:

> "We make sure our transmission lines are clear of encroaching trees"
>
> "Our utiility only owns a small amount of transmission line, but it has the right-of-way cleared and trimmed on a regular basis to insure continuity of service"
>
> "We have five tree crews that work year round to trim and remove trees that are near our power lines. This is the number one action we perform to maintain reliability."
>
> "We have a vegetation management supervisor, utility arborist, and 12 contract tree trimming crews. We try to get through the entire primary system within 5 years.

Additionally, Lane County Public Works has a process for reporting hazardous trees outlined in section 8 of the Lane County Vegetation Management Standards and Guidelines, Series 2, Top Trimming Standards. Adhering to this policy is the extent to which staff resources can be dedicated to identifying and cataloging hazardous trees.

- **This action item will be removed from the 2011 Plan Update because its basic intent (tree maintenance) is adequately addressed by Standard Operating Procedures of both Lane County Public Works and local utilities.**

O. Action Item No. WH #9
Amended Item No: N/A – Action Completed

"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."

Status Update

This action items pertains to local utilities; local utilities are not adopters of the county's hazard mitigation plan and the county has no control over the entities assigned to these items. However, according to a recent survey of utilities we found the following results:

- "upgrading lines and poles to improve wind / ice loading": 66.7% said they would only implement this type of measure after severe damages has occurred and 33.3% said it was either not applicable or cost prohibitive for their utility.

- "undergrounding critical lines": 33% said this had already been done; 33% said they would do so only after severe damage was incurred and; 33% said that it was not applicable or cost prohibitive for their utility.

- "adding interconnect switches to allow alternative feed paths and disconnect switches to minimize outage areas": 33% said they plan to do something along these lines in the next 1 – 5 years; 33% in the next 6 – 10 years and 33% said it not applicable or cost prohibitive for their utility.

➢ **This action item will be removed from the 2011 Plan Update because it is not specific to the county.**

P. Action Item No. WH #6 Amended Item No: 9

"Identify which critical facilities in Lane County need backup power and emergency operations plans to deal with power outages."

Status Update

This action item is on-going and in-progress. This action item will be incorporated into a new item that maps all critical facilities within hazardous areas. Those facilities will be surveyed to determine what kind of back-up power, if any, they have. This information will be depicted on the map.

- o According to a recent survey of Fire Service agencies, only about half of all fire service facilities have a back-up power source.

- o The Florence Events Center, a critical facility in the event of a coastal tsunami, recently purchased a back-up generator.

- o The Lane County Sheriff's Office Communications Center has back-up power.

➢ **This action item will remain in the 2011 Plan Update as on-going**

Q. Action Item No. VH #3, DH #1, DH #2, TH #2
Amended Item No: N/A

"Upgrade physical security detection and response capability for critical facilities, including water systems."

"Train first responders on alert/warning systems, emergency plan and evacuation routes."

"Encourage the Corps of Engineers to complete seismic vulnerability assessments for dams upstream of heavily populated areas in Lane Countay and to make seismic improvements as necessary."

These action items were assigned to the Eugene Water and Electric Board (EWEB) and the U.S. Army Corps of Engineers (USACOE) and are specific to their dams or facilities. Neither EWEB nor the USACOE are adopters of the county's hazard mitigation plan and the county has no control over the agencies assigned to these items. Nonetheless, the intent of these items is valid and related activities were conducted by the county.

Status Update:

- Evacuation plans were discussed and development is in progress related to an impending catastrophic dam failure of the USACOE's Hills Creek and Lookout Point dams.

- The county worked closely with USACOE on a major public education campaign to inform the public about their on-going dam maintenance program, especially work currently being done on their spillway gates.

- The county participates in EWEB's annual exercises pertaining to their dams.

➢ **These action items will be removed from the 2011 Plan Update because they are not specific to the county. The intent of the action items will be incorporated into other rewritten action items.**

R. Action Item No. HMH #1, HMH #2 Amended Item No: N/A

"Enhance emergency planning, emergency response training and equipment to address hazardous materials incidents."

"Ensure that first responders have readily available site-specific knowledge of hazardous chemical inventories in Lane County."
These action items were assigned to the state's Regional HazMat Team and the Oregon State Fire Marshal. Neither the Regional HazMat Team nor the State Fire Marshal are adopters of the county's hazard mitigation plan and the county has no control over the agencies assigned to these items.

- **These action items will be removed from the 2011 Plan Update because they are not specific to the county. However, the intent of the action items will be incorporated into other rewritten action items.**

S. Action Item No. TH #1 Amended Item No: 10

"Enhance emergency planning, emergency response training and equipment to address potential terrorist incidents."

Status Update

This is accomplished on an on-going basis through NIMS Compliancy requirements and projects funded by the State Homeland Security Grant.

- **This action item will remain in the 2011 Plan Update as on-going**

T. Action Item No. VH #1, VH #2 Amended Item No: N/A

"Update public emergency notification procedures for ash fall events."

"Update emergency response planning for ash fall events."

"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."

These action items will be removed from the 2011 Plan Update ash fall events are considered a low probability, low consequence hazard.

2011 Program Action Items

There were several factors considered in determining the action items for the next five years. This Plan update is being written during a time that the United States is experiencing unprecedented economic hardship. Consequently, what could not be ignored is the ubiquitous problem of shrinking budgets and thinning resources. Therefore, to keep the plan meaningful, potential action items were prioritized and only those meeting the following criteria were included in the Plan:

- Does the purpose of the Action Item (AI) align with the core mission of Lane County government?
- Is there motivation to carry out the AI?
- Do we know what to do to carry out the AI?
- Does the AI address some of our most pressing challenges?
- Is implementing the AI feasible in terms of cost and resources?
- Are there tangible benefits?

Action Item 1. Mitigation Coordinating Committee

Establish Mitigation Coordinating Committee to act as a forum for hazard mitigation issues, disseminate hazard mitigation ideas and activities to all participants, monitor implementation of the Action Items and report on progress and recommended changes to the Plan as appropriate; includes identifying opportunities to incorporate mitigation actions into other planning mechanisms, such as comprehensive or capital improvements, as appropriate.

- *Responsible Agency*: Lane County Emergency Management
- *Timeline*: Continuous
- *Cost*: Staff time
- *Benefits*: Demonstrates a deliberative approach to planning and implementation that involves the necessary stakeholders and subject matter experts to carry out action items and incorporate them into other planning mechanisms for broader reach throughout the community.

Action Item 2. Public Education and Outreach

Conduct public outreach activities related to natural hazard mitigation and personal preparedness using a variety of media sponsored by various agencies, such as:

a. Community newsletters and direct mailings
b. News releases and public service announcements
c. Presentations at meetings of neighborhood, civic or business groups
d. Displays in public buildings or shopping malls

- *Responsible Agency:* Lane County Emergency Management. Other county departments will also participate along with municipalities and special districts.

- *Timeline:* Continuous

- *Cost:* Most projects will only cost staff time for the development of electronic newsletters and website postings. Others, such as directed mailings and brochures will have printing and/or postage expenses.
- *Benefits:* There are many benefits to having a well-informed public. For example, deaths from various hazards are declining over time as people become more aware of what they should and should not do. More self-help and self-protection measures will be implemented if people know about them and are motivated to pursue them.

Action Item 3. Utilize HAZUS-MH Software

Develop in-house competency with HAZUS-MH software so that additional loss-estimation data can be provided regarding reducing the effects of hazards on existing buildings and infrastructure.

- *Responsible Agency*: Lane County Public Works, GIS Division

- *Timeline*: June 2012 and continuing

- *Cost*: Staff time and costs associated with attending training at FEMA's Emergency Management Institute.

- *Benefits*: Informs decision makers and others interested in hazard mitigation about hazard risks and potential risk reduction measures.

Action Item 4. Hazard Mapping

Develop a list of hazard types to be mapped; identify, locate and obtain the necessary data and create hazardous area maps. Plot critical facilities and infrastructure on the hazardous area maps to show their location within the hazard areas.

- *Responsible Agency*: Lane County Emergency Management in partnership with Public Works, GIS Division

- *Timeline*: June 2013

- *Cost*: Staff time

- *Benefits*: Informs decision makers and others interested in hazard mitigation about hazard risks and potential risk reduction measures. Can serve as foundation for Comprehensive Plan hazard inventories

Action Item 5. Vulnerable Populations Database / Registry

Expand existing special needs population data to include detailed inventory of all at-risk communities (elderly, homeless, disabled, etc.) that are without access to transportation and communication and determine mechanisms for alert/ warning and evacuation

- *Responsible Agency:* Lane County Public Health in partnership with the Vulnerable Populations Emergency Preparedness Coalition

- *Timeline:* Continuous

- *Cost:* Staff time

- *Benefits:* Potentially mitigates the impact of natural hazards on the community's most vulnerable populations.

Action Item 6. Refine and Update Land Use Regulations

Review and develop recommendations to the Lane County Board of Commissioners for additions and enhancements to the Lane County Rural Comprehensive Plan (RCP) Goal 7, Natural Hazards Inventory and implementing land use regulations in Lane Code for the following known risks:

- channel migration areas
- dam failure inundation areas
- expanded wildland-urban interface areas*
- landslide / unstable slopes
- special flood hazard areas (as updated studies and maps are produced)*
- tsunami inundation areas
- updated dune migration areas*
- volcanic debris flow paths

**Adopted inventories and/or land use regulations currently exist for these hazards but may require period updates and refinements*

- *Responsible Agency*: Lane County Land Management Division
- *Timeline*: Continuous
- *Cost*: Staff time
- *Benefits:* By incorporating mitigation provisions into other plans and regulations, more offices will be implementing mitigation activities, hazardous areas will be avoided and new developments will be better protected.

Action Item 7. Examine Tsunami Warning Response Protocols

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.

- *Responsible Agency*: Lane County Emergency Management in partnership with the West Lane Emergency Operations Group.
- *Timeline*: December 2012
- *Cost*: Staff time.
- *Benefits:* Enhanced mitigation and response to Tsunami Warnings.

Action Item 8. Upsize Culverts and Storm Water Drainage Systems

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.

- *Responsible Agency*: Lane County Public Works, Road Maintenance Division
- *Timeline*: Continuous
- *Cost*: $ 75,000 - $ 200,000
- *Benefits:* Reduced localized flooding, property damages and road closures.

Action Item 9. Backup Power for Critical Facilities

Identify which critical facilities in Lane County need backup power and emergency operations plans to deal with power outages.

- *Responsible Agency*: Lane County Emergency Management
- *Timeline*: Continuous

- *Cost*: $25,000 - $150,000

- *Benefits:* Continuity of operations for government facilities that would otherwise experience service interruptions.

Action Item 10. Planning for Terrorist Incidents

Enhance emergency planning, emergency response training and equipment to address potential terrorist incidents.

- *Responsible Agency*: Lane County Sheriff's Office

- *Timeline*: Continuous

- *Cost*: Staff time

- *Benefits:* Improved capability to protect the public and environment from terrorist threats.

Action Item 11. Cost-Benefit Review of Mitigation Action Items

During the next five year cycle of Plan implementation and review, more conduct periodic review of prioritization and conduct cost-benefit analysis to ensure we are adapting to changing priorities and economic crisis while at the same time capitalizing on the most beneficial projects for mitigating hazards and reducing risk.

- *Responsible Agency*: Lane County Emergency Management

- *Timeline*: Continuous

- *Cost*: Staff time

- *Benefits*: Maximizes benefit to the community in terms of hazard risk reduction and mitigation.

Action Item 12. Planning for Pandemic Illness and Other Health Hazards

Enhance emergency planning, emergency response training and equipment to address pandemic illness and other health hazards.

Responsible Agency: Lane County Public Health

Timeline: Continuous

Cost: Staff time

Benefits: Improved capability to protect the public from health hazards.

Appendix A – Utility Service Survey

Introduction

Lane County Emergency Management conducted a survey of the local utility companies using Survey Monkey, an on-line survey tool, in June of 2011.

The goal of the survey was to collect responses regarding the hazard and mitigation measures that are/are not taken by utility companies in Lane County for inclusion in the 5-year update to the Lane County Natural Hazards Mitigation Plan.

Demographics

All utility companies in Lane County were invited to participate in the survey. Three surveys were completed and the agencies are listed below:

- Blachly Lane Electric Cooperative
- Eugene Water and Electric Board
- Emerald People's Utility District (2 responders, 1 combined survey result)

Survey Results

Key Findings

- Wind and snow storms are the biggest cause for power outages and damages to the utility.
- When hazards occur, wind and ice storms have the severest impact on the utilities.
- All three of utilities believe that providing looped distribution service or other redundancies to critical facilities would be an extremely effective mitigation measure for lessening the impact of natural hazards however, one utility finds it cost prohibited while the other two utilities estimate looped distribution service will be provided in 1-5 years or 6-10 years.
- Two of the utilities believe that providing under-ground lines near business districts and critical facilities would be an extremely effective mitigation measure and the other responding utility has already done this. The two utilities who have not

completed this mitigation measure find it either cost prohibited or that they can only provide it after severe damage has been done to the existing lines.

- All agencies perform regular tree maintenance around transmission lines, including monitoring the health of the trees.

Survey Questions and Responses

Each of the questions in the survey was not necessarily responded to by every survey taker, so the number of responses shown for each question varies. Some questions were multiple-choice, while other questions directed the survey taker to comment on, or mark all answers that apply. Each question below includes a "response count", indicating how many total responses were received.

Q1: How frequently do the following natural hazards cause power outages or facility damages for your utility?

Answer Options	Never	Once per year	2-3 times per year	4 or more times per year	Response Count
Domestic Terrorism / Vandalism	0	1	1	0	2
Earthquake	2	0	0	0	2
Flood	1	1	0	0	2
Hazardous Materials Incident	1	1	0	0	2
Ice Storm	0	2	0	0	2
Landslide	1	1	0	0	2
Snow Storm	0	0	2	0	2
Wind Storm	0	0	2	0	2
Wildfire	2	0	0	0	2
Other (please specify)					1
				answered question	2
				skipped question	1

Q2: Please rate the severity of impact the hazards have on your electric facilities when they occur.

Answer Options	No Impact	Minimal Impact	Moderate Impact	Severe Impact	Response Count
Domestic Terrorism / Vandalism	0	2	0	0	2
Earthquake	2	0	0	0	2
Flood	1	1	0	0	2
Hazardous Materials Incident	1	1	0	0	2
Ice Storm	0	1	0	1	2
Landslide	1	1	0	0	2
Snow Storm	0	1	1	0	2
Wind Storm	0	0	1	1	2

Wildfire	2	0	0	0	2
Other (please specify)					1
				answered question	2
				skipped question	1

Q3: Please rate the level of effectiveness each of the following mitigation measures could have in lessening the impact of natural hazards on your utility.

Answer Options	Already Done	Somewhat Ineffective	Somewhat Effective	Extremely Effective	N/A or Cost Prohibitive	Rating Avg	Response Count
Installing additional poles to support transformers	2	1	0	0	0	1.33	3
Installing additional guy-wires	2	0	1	0	0	1.67	3
Providing looped distribution service or other redundancies to critical facilities	0	0	0	3	0	4.00	3
Elevating pad-mounted transformers above the base flood elevation	1	1	1	0	0	2.00	3
Replacing damaged poles with higher-rated poles of the same or different material	1	0	2	0	0	2.33	3
Cross bracing on H Frame Poles	2	0	1	0	0	1.67	3
Removing large diameter communication lines	0	0	2	1	0	3.33	3
Upgrading conductors to Wind-Motion Resistant Conductors	0	0	2	0	1	3.00	3
Upgrading lines and poles for wind / ice loading	0	0	1	1	1	3.50	3
Under-grounding lines near business districts and critical facilities.	1	0	0	2	0	3.00	3
					answered question		3
					skipped question		0

Q4: If you had to estimate, at what point in time do you think your utility might implement the mitigation measures you identified as effective in the previous question?

Answer Options	Already Done	In the next 1 - 5 years	In the next 6 - 10 years	Only After Severe Damage	N/A or Cost Prohibitive	Rating Avg	Response Count
Installing additional poles to support transformers	2	0	0	0	1	1.00	3
Installing additional guy-wires	2	0	0	1	0	2.00	3
Providing looped distribution service or other redundancies to critical facilities	0	1	1	0	1	2.50	3
Elevating pad-mounted transformers above the base flood elevation	2	0	0	1	0	2.00	3
Replacing damaged poles with higher-rated poles of the same or different material	1	0	0	2	0	3.00	3

Cross bracing on H Frame Poles	2	0	0	1	0	2.00	3
Removing large diameter communication lines	0	0	0	1	2	4.00	3
Upgrading conductors to Wind-Motion Resistant Conductors	0	0	0	1	2	4.00	3
Upgrading lines and poles for wind / ice loading	0	0	0	2	1	4.00	3
Under-grounding lines near business districts and critical facilities.	1	0	0	1	1	2.50	3
					answered question		3
					skipped question		0

Q5: Please briefly describe any hazard mitigation projects your electric utility has completed in the past five years.

Answer Options	Response Count
We have established redundancy in our distribution circuits at several substations that give us distribution ties to more than one source. We have also installed "tree wire" circuits to mitigate fallen trees in a wind storm. Significant tree trimming.	
none	
5 and 10 year capital plans designed to replace aging infrastructure.	
answered question	*3*
skipped question	*0*

Q6: Please briefly describe any hazard mitigation projects your electric utility plans to complete in the next five years.

Answer Options	Response Count
We plan on installing more "tree wire" circuits as this has proven to withstand many of the hazards a wind storm brings. We also plan on utilizing more underground mainline throughout our system. We also have several reconducter jobs and feeder line rebuilds planned through out system.	
none	
Rebuilding the downtown network, replacing feeders, some transmission work.	
answered question	*3*
skipped question	*0*

Q7: Does your agency regularly perform tree maintenance around transmission lines?

Answer Options	Response Percent	Response Count

Yes	100.0%	3
No	0.0%	0
Please briefly explain your answer:		
EPUD only owns a small amount of transmission line, but it has the ROW cleared and trimmed on a regular basis to insure continuity of service.		
We make sure our transmission lines are clear of encroaching trees.		
We have a vegetation management supervisor, utility arborist, and 12 contract tree trimming crews. We try to get through the entire primary system within 5 years.		
	answered question	3
	skipped question	0

Q8: Does your agency regularly evaluate the health of trees near your facilities?

Answer Options	Response Percent	Response Count
Yes	100.0%	3
No	0.0%	0
Please briefly explain your answer		
Any trees deemed "danger trees" are aggressively looked at and we work with the tree owner to eventually remove the tree or trim until it is deemed safe.		
During our annual PUC inspections we evaluate the health of trees near our facilities.		
With the employees listed above.		
	answered question	3
	skipped question	0

Q9: Does your agency maintain a hazardous tree inventory?

Answer Options	Response Percent	Response Count
Yes	33.3%	1
No	66.7%	2
Please briefly explain your answer		
EPUD has regular ROW inspections where "danger trees" are indentified and kept track of until the situation is corrected. Danger trees are removed within weeks of indentifying them.		
We don't have any as we remove them immediately.		
	answered question	3
	skipped question	0

Q10: Does your agency encourage property owners to prune trees near service drops?

Answer Options	Response Percent	Response Count
Yes	33.3%	1
No	66.7%	2

Please briefly explain your answer	
But, rather than have the customer do the trimming we ask that they call us and we send a serviceman by to do the actual trimming. We also deenergize the lines when property owners are working around them. We find that customers tend to get too enthusiastic and venture too close to our other facilities; transformers, primary lines, etc.	
answered question	3
skipped question	0

Q11: Please indicate whether the following mapping activities would be useful toward mitigating hazard impacts on your utility.

Answer Options	Not Useful	Somewhat Useful	Very Useful	Unsure; Need More Info	Rating Avg	Response Count
Access to a centralized GIS data repository for hazard data	1	0	2	0	2.33	3
Identifying areas vulnerable to landslides as a result of wildfires.	1	0	2	0	2.33	3
				answered question		3
				skipped question		0

Appendix B – Fire Service Survey

Introduction

Lane County Emergency Management conducted a two-part fire service survey using Survey Monkey, an on-line survey tool, in May of 2011.

In part-one, the goal of the survey was to collect responses regarding the description and condition of fire service facilities for the purpose of being incorporated into a FEMA loss estimation database called HAZUS for purposes of estimating economic losses related to disasters.

In part-two, the goal of the survey was to collect qualitative information regarding risk mitigation measures for inclusion into the 5-year update to the Lane County Natural Hazards Mitigation Plan.

Demographics

All fire service agencies in Lane County were invited to participate in the survey. Seventeen agencies took part in responding to the survey and are listed below:

- Coburg Fire District
- Dexter RFPD
- Eugene Fire & EMS Department
- Goshen Fire District
- Hazeldell Rural Fire District
- Junction City Rural Fire Protection District
- Lane County Fire District #1
- Lane Rural Fire/Rescue
- Lowell Rural Fire Protection District
- McKenzie Fire/Rescue
- Oakridge Fire & EMS
- Pleasant Hill Rural Fire Protection District
- Santa Clara Fire District
- Siuslaw Valley Fire and Rescue
- South Lane County Fire & Rescue
- Springfield Fire & Life Safety
- Upper McKenzie Rural Fire Protection Dist

Survey Results

Key Findings

Part 1 – HAZUS, FEMA loss estimation database

- A large percent of fire service agencies reported buildings to be in good to excellent condition. A small percentage of responders did report buildings to be in poor to average condition. See chart below.
- The majority of service buildings are constructed of wood with slab on grade foundations.
- Only about half of all fire service facilities have a back-up power source.
- 7 out of 54 service buildings are set up to function as post-hazard shelter facilities.

Part 2 – NHMP, risk mitigation

- 91% of all agencies provide some form of information on how to reduce fire risk to the community.
- Information provided to the community is most commonly dispersed through the Lane County Fire Prevention Co-op, agency websites, information display boards, and agency newsletters.
- Most agencies will provide individual homeowner consultations.
- Most agencies help to educate residents on fire risk reduction measures on an annual basis.
- The most common obstacles that hinder the ability of an agency to fight fire are poor address signage and driveways that are too narrow and that have no turnabout.

Survey Questions and Responses

Each of the questions in the survey was not necessarily responded to by every survey taker, so the number of responses shown for each question varies. Some questions were multiple-choice, while other questions directed the survey taker to comment on, or mark all answers that apply. Each question below includes a “response count”, indicating how many total responses were received. Participant responses are also summarized at the end of the survey results.

Q2: Please rate the level of condition the building is currently in.							
Answer Options	Poor	Fair	Avg	Good	Very Good	Exclnt	Rating Avg
Building Exterior	2	10	7	14	9	12	4.00
Roof	3	11	6	11	10	13	3.98
Building Foundation	3	6	5	18	12	10	4.11
Building Interior	7	7	6	13	12	9	3.80
Overall Perception of Building	3	10	6	11	15	9	3.96
						answered question	*54*
						skipped question	*0*

Q3: What type of structure is this building? Check all that apply.		
Answer Options	Response Percent	Response Count
Wood	81.5%	44
Steel	38.9%	21
Reinforced Concrete	5.6%	3
Unreinforced Concrete	1.9%	1
Reinforced Masonry	18.5%	10
Unreinforced Masonry	20.4%	11
Other (please specify)	0.0%	0
	answered question	54
	skipped question	0

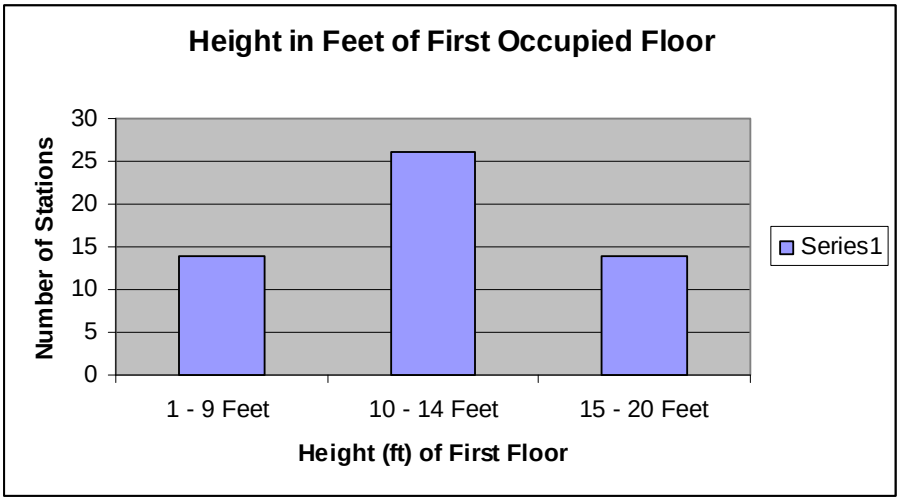
Q4: What year was the building constructed?			
Answer Comments			Response Count
1949	1974	1993	
1950	1975	1994	
1961	1975	1997	
1962	1975	1998	
1963	1975	1998	
1964	1976	1998	
1966	1978	1998	
1967	1978	1999	
1968	1980	2001	

1968	1981	2005
1970	1981	2005
1970	1981	2006
1970	1984	2009
1970	1984	2009
1971	1985	2010
1971	1988	2010
1973	1993	
	answered question	51
	skipped question	3

Q5: What type of foundation does the building have? Check all that apply.		
Answer Options	**Response Percent**	**Response Count**
Pile	5.6%	3
Pier	1.9%	1
Solid Wall	1.9%	1
Basement/Yard	0.0%	0
Crawl Space	1.9%	1
Fill	1.9%	1
Slab on Grade	94.4%	51
Other (please specify)	3.7%	2
	answered question	54
	skipped question	0

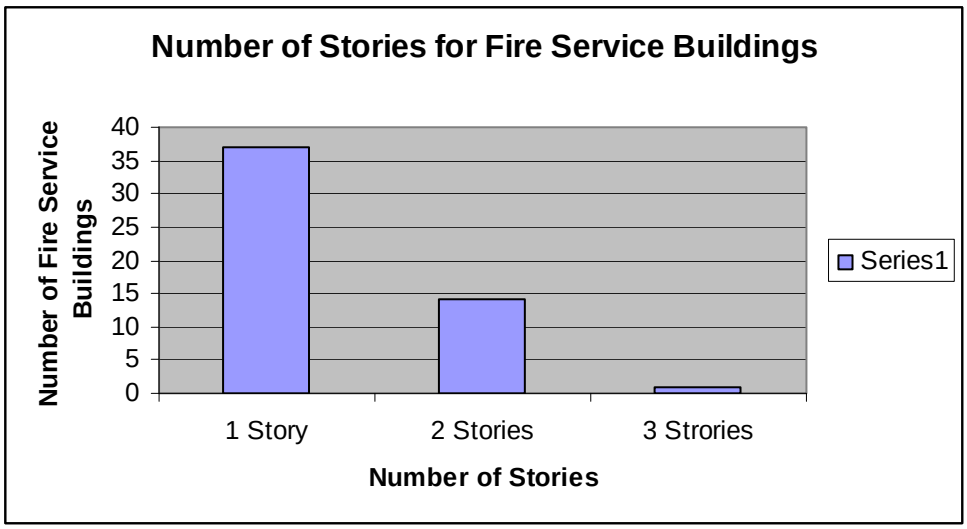
Q6: What is the height (in feet) of the first occupied floor?	
Answer Options	**Response Count**
See Table 6.A Below	54
answered question	54
skipped question	0

Table 6.A



Q7: How many stories does this building have?	
Answer Options	**Response Count**
See Table 7.A Below	54
answered question	**54**
skipped question	**0**

Table 7.A



Q8: Does the building have a backup power source?		
Answer Options	Response Percent	Response Count
Yes	51.9%	28
No	48.1%	26
answered question		54
skipped question		0

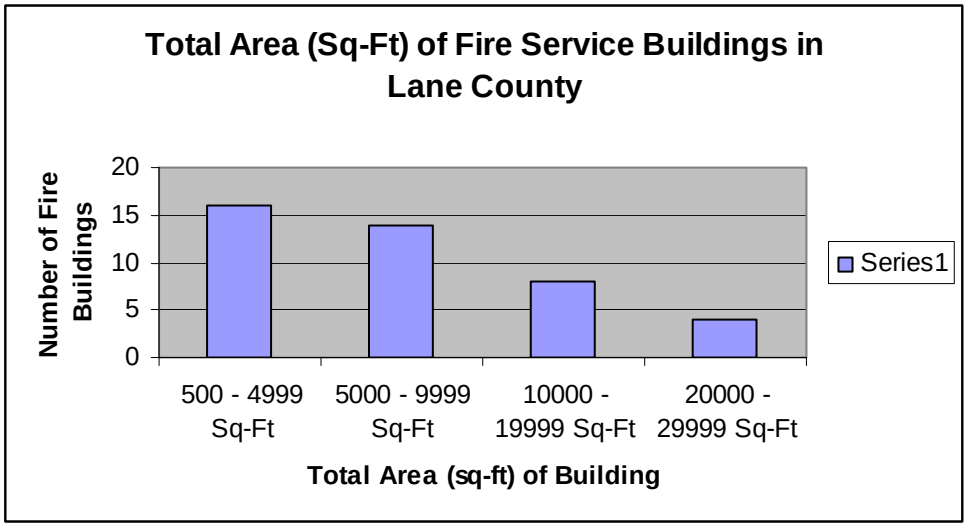
Q9: Is your facility set-up for the function of a post-hazard shelter location? If yes, what is the shelter capacity?		
Answer Options	Response Percent	Response Count
Yes	13.0%	7
No	87.0%	47
Total Shelter Capacity:		8
answered question		54
skipped question		0

Q9 Cont. If yes, what is the shelter capacity?

Station	Total Shelter Capacity:
1	50
2	50
3	100
4	10
5	75
6	100
7	50

Q10: What is the total building area in square feet?	
Answer Options	Response Count
See Table 10.A Below	43
answered question	43
skipped question	11

Table 10.A



Q11: Is this building equipped with a kitchen?		
Answer Options	**Response Percent**	**Response Count**
Yes	77.4%	41
No	22.6%	12
	answered question	53
	skipped question	1

Q12: What is the total number of vehicles housed at your facility?					
Answer Options	**1**	**2**	**3**	**4**	**Response Count**
Trucks	8	1	1	0	10
Engines	26	16	2	0	44
Medic Units	15	4	2	1	22
Tender	23	4	0	0	27
Brush	20	2	1	0	23
Boats	5	2	0	0	7
SUV	10	6	1	1	18
Other Vehicles (please specify)					28
			answered question		49
			skipped question		5

Q13: Does your agency provide information to the community about how to reduce fire risk?		
Answer Options	Response Percent	Response Count
Yes	90.9%	20
No	9.1%	2

Q14: How does your agency provide fire risk reduction information to your community. Click all that apply.		
Answer Options	Response Percent	Response Count
Community Meetings	61.9%	13
Information Display Boards	42.9%	9
Mailers	28.6%	6
Public Service Announcements provided to local media by your agency	28.6%	6
Your Agency Newsletter	33.3%	7
Through Lane County Fire Prevention Co-op	66.7%	14
Your Agency Website	57.1%	12
Not Applicable (N/A)	0.0%	0
Other (please specify)		4

Q15: Does your agency provide individual homeowner consultations about how to reduce fire risk?		
Answer Options	Response Percent	Response Count
Yes	81.8%	18
No	18.2%	4

Q16: Are homeowner consultations performed as a normal course of day-to-day business or reserved for planned outreach projects?		
Answer Options	Response Percent	Response Count
Day-to-Day Business	54.5%	12
Planned Outreach Projects	31.8%	7
Not Applicable (N/A)	18.2%	4

Q17: What issues do homeowner consultations most commonly address?

Answer Comments	Response Count
Smoke Detectors	
Neighbors, clearance to vegetation and fuels	
fuel loading, defensible space & driveway information	
fuel loading & defensible space	
Combustibles to close to ignition sources, batteries dead in smoke detectors, overloaded outlets.	
vegetation, access and fire rating	
wild land issues	
driveway access	
not something we do very often only on request from the homeowner which only happens a few times a year	
Wild land Urban Interface fuels reduction and structural triage Defensible Space	
Access (driveways, bridges), Defensible space, Construction methods and materials	
Smoke and Co2 alarms, escape plans, portable heater safety, trip hazards, use of power cords	
Answered Questions 13	

Q18: Please indicate how often your agency helps educate residents on the following risk reduction measures. Choose the answer that is most current.

Answer Options	At least once in the past 1yr	At least once in the past 3yrs	Plan to in the next 1yr	Plan to once in the next 3yrs	Response Count
Benefits of replacing wood shake roofs	11	1	6	0	18
Benefits of steel vent screening	8	1	6	0	15
Benefits of fire safe decking	10	1	6	0	17
Placing wood piles more than 30 feet from outbuildings	10	1	6	0	17
Providing 10 feet or more clearance around propane tanks	10	1	6	0	17
Removing hazardous vegetative fuel around structures	10	1	6	0	17
Other (please specify)					3

Q19: Does your agency have an evacuation plan for communities most at risk of fire?		
Answer Options	Response Percent	Response Count
Yes	40.9%	9
No	59.1%	13

Q20: How have you communicated the fire evacuation plan? Check all that apply.		
Answer Options	Response Percent	Response Count
Community meetings	19.0%	4
Mailers	9.5%	2
Information display boards	0.0%	0
In person when asked	28.6%	6
Not Applicable (N/A)	57.1%	12
Other (please specify)		7

Q21: Please indicate about how often the following obstacles interfere with your agency's ability to fight fires.						
Answer Options	Never	Once every few years	Once per year	Two times or more per year	On every call	Response Count
Accessing gated communities	2	14	2	4	0	22
Impassable roadways due to vegetative overgrowth	1	12	2	7	0	22
Driveways too steep for apparatus	4	12	4	2	0	22
Single lane bridges	3	12	5	2	0	22
Poor address signage	4	10	0	7	1	22
Long driveways with no turnabout	2	8	4	7	0	21
Long driveways too narrow for two vehicles	2	9	2	8	1	22
Lack of accessible water sources for fighting fires	4	12	1	4	1	22
Water delivery systems inadequate for fighting fires	7	11	1	1	2	22
Other (please specify)						0

Q22: How would you like to see these fire fighting obstacles resolved?	
Answer Comments	**Response Count**
Engage community in vegetation management and public education about wild land urban interface fires.	
Better monitoring by County of Fire Code when issuing building permits and follow up of rural areas	
Better code enforcement and plans review	
Address markers need to be purchased. Building permits not given out until proof that there is access.	
planning with input from the local community	
public education, zoning requirements	
by county ordinance and/or state fire code	
A good start would be to get county support on board with a standard enforced road standard that is enforceable no only when new construction happens but whenever the driveway begins to get overgrown or the road becomes to rough to drive on.	
The biggest obstacles are driveway clearance for height and width, enforcement of county code.	
Enforcement of driveway standards thru the building permit process Addressed through permit process with county and enforce rules & increase notification of district on new construction. Method to enforce current standards on older properties. Incentives to upgrade.	
5 water tenders, good enforcement of current regulations	
Through education	
	13

Appendix C – Copies of Meeting Minutes and Agendas

2008 Earthquake Mitigation Meeting

From: COOK Linda L
To: COOK Linda L; RIZZI Joseph D; SCHESSER Howard (SMTP); MURPHY Dennis; "Myron Smith"; BUCHANAN John (SMTP); "Oakridge Fire (oakfire@qwest.net)"; MORGAN Jacque (SMTP); "coburgfire@nu-world.com"; HOEHN Keith (SMTP); HARSHBARGER Guy (SMTP); ROSS Gary P (SMTP); GILLETTE Karen S; "Mary Bork (phnmab@comcast.net)"; WILDE Kristi J; SCHESSER Howard (SMTP); TILBY Chuck R; HOWARD Galen W; "DePew Tracy (HRSA@co.douglas.or.us)"; MURPHY Dennis; "Gerald Shorey (jerrysofd@qwest.net)"; MORGAN Jacque (SMTP); GILLETTE Karen S; "Triva N. Hazelton (Triva.Hazelton@therightbank.com)"; ANDRUS Abby; RIZZI Joseph D; MILLER Keir C; "Andre LeDuc"
Cc: HOWE Kent; "James Roddey"; TURNER Tom M
Subject: Notes from Earthquake Mitigation Meeting
Date: Monday, August 25, 2008 3:36:15 PM
Attachments: Notes from Earthquake Mitigation Meeting.doc

All,

Attached are the meeting notes from the Earthquake Mitigation Meeting held August 14. These notes are intended to prepare you for briefing local officials and others about the earthquake hazard in Lane County. The goal of the meeting was to ensure that we have a cohesive message countywide based on the most reliable information available.

Please feel free to contact me if you have any comments, questions or concerns. Thank you very much to everyone who contributed to developing these notes.
Linda
****
Linda L. Cook, PMP
Emergency Manager
Lane County Sheriff's Office
125 E. 8th Ave.
Eugene, Oregon 97401
(541) 682.6744
(541) 914.0267 cell
http://lanecounty.org/EmerMgmt
lane county:

wOrking

for you

From: COOK Linda L
Sent: Wednesday, July 23, 2008 4:17 PM
To: RIZZI Joseph D; SCHESSER Howard (SMTP); MURPHY Dennis; 'Myron Smith'; BUCHANAN John (SMTP); Oakridge Fire (oakfire@qwest.net); MORGAN Jacque (SMTP); coburgfire@nu-world.com; HOEHN Keith (SMTP); HARSHBARGER Guy (SMTP); ROSS Gary P (SMTP); GILLETTE Karen S; COOK Linda L; 'Mary Bork (phnmab@comcast.net)'; WILDE Kristi J; SCHESSER Howard (SMTP); TILBY Chuck R; HOWARD Galen W; 'DePew Tracy (HRSA@co.douglas.or.us)'; MURPHY Dennis; 'Gerald Shorey (jerrysofd@qwest.net)'; MORGAN Jacque (SMTP); GILLETTE Karen S; 'Triva N. Hazelton (Triva.Hazelton@therightbank.com)'; ANDRUS Abby; RIZZI Joseph D; MILLER Keir C; 'Andre LeDuc'
Cc: HOWE Kent; 'James Roddey'; TURNER Tom M
Subject: Invitation to Earthquake Mitigation Meeting

All,

This is to invite you to a special meeting to discuss a report recently released by the Department of Geology and Mineral Industries (DOGAMI) that depicts damage and loss estimates for two types of worst case scenario earthquakes (crustal earthquake in the valley floor and a subduction zone earthquake in the Pacific ocean) for several counties, including Lane County. James Roddey, Earth Sciences Information Officer for DOGAMI, has agreed to provide an overview of the report and answer any questions. The intent is for those of us attending the meeting to better understand the risk to the communities we serve and to identify any potential actions that could be taken to mitigate the impact of such an event. Additionally, the information and discussion from the meeting should provide sufficient information for briefing our local officials, if necessary.

Date: Thursday August 14, 2008
Time: 1:30 - 3: 30 p.m.
Location: Lane County Public Service Building; Bob Straub Conference Room on second floor; 125 E. 8th Avenue, Eugene, OR 97401

Please R.S.V.P. by Monday August 11, 2008 via email reply or phone.

Thank you very much.

Linda L. Cook, PMP
Emergency Manager
Lane County Sheriff's Office
125 E. 8th Ave.
Eugene, Oregon 97401
(541) 682.6744
(541) 914.0267 cell
http://lanecounty.org/EmerMgmt
lane county:

wOrking
for you

Notes from Earthquake Mitigation Meeting – August 14, 2008

Attendees: Mary Bork (K-12 Schools), Jacque Morgan (City of Florence), Bob Willoughby (City of Florence), Tracy DePew (Hospital Preparedness Region 3), Brian Johnson (Lane County Public Health), Joe Rizzi (City of Eugene), John Buchanan (Siuslaw Valley Fire & Rescue), Howard Schesser (City of Cottage Grove), Amanda Ferguson (City of Cottage Grove), Jessica (City of Cottage Grove), Keir Miller (Lane County Land Management), Bill Clingman (Lane Council of Governments), Linda Cook (Lane County Emergency Management), James Roddey (OR Dept. of Geology & Mineral Industries).

Talking points for briefing local officials and others about earthquake hazard risk in Lane County.

What We Know

• Earthquakes happen in the Pacific Northwest. The seismology lab at the University of Washington records roughly 1,000 earthquakes per year in Washington and Oregon. Between one and two dozen of these cause enough ground shaking to be felt by residents. Most are in the Puget Sound region, and few cause any damage. However, based on the history of past damaging earthquakes and an understanding of the geologic history of the Pacific Northwest, we are certain that damaging earthquakes (magnitude 6

or greater) will recur in our area, although we have no way to predict whether this is more likely to be today or years from now.

• The Cascadia Subduction Zone is a very long sloping fault in the Pacific Ocean that stretches from mid-Vancouver Island to Northern California. It separates the Juan de Fuca and North America plates. New ocean floor is being created offshore of Washington and Oregon, and the ocean floor is constantly being pushed toward and beneath the continent. As more material wells up along the ocean ridge, the ocean floor is pushed toward and beneath the continent. The Cascadia Subduction Zone is where the two plates meet.

• In May 2007 DOGAMI released the Statewide Seismic Needs Assessment Data depicting the vulnerability of critical facilities (schools, police, fire, hospitals, etc.,) to seismic hazards. The assessment used methodology called Rapid Visual Screening. The results indicate that many schools throughout Lane County are vulnerable to collapse during an earthquake. More information can be found at http://www.oregongeology.com/sub/default.htm.

• In July 2008, DOGAMI released a report describing the geologic hazards in a six-county area including Lane County, and providing damage and loss estimates for future major earthquakes. More information can be found at http://www.oregongeology.com/sub/publications/ims/ims-024/ims-24.htm

• In the event of a major earthquake in Lane County, depending on the time of day, time of year and type of earthquake, it is highly likely that hundreds of people will be killed, thousands of people will be injured and, tens of thousands of households will be displaced. Response resources will be overwhelmed.

• Major losses can also be expected in the event of a major crustal earthquake, but it is likely that outside resources from other parts of Oregon will be able to reach the affected area to provide assistance. In contrast, however, in the event of a major Cascadia Subduction Zone earthquake, coastal areas will be isolated and major damage will occur over a widespread area making it very difficult for outside resources to reach the affected areas.

• Landslides caused by earthquakes are very common. It is difficult to pinpoint the exact locations where landslides might occur in Lane County, but large areas of the County are believed to be at risk.

• The Army Corps of Engineers operates several dams in Lane County that are situated upstream of the Springfield-Eugene Metropolitan Area. The primary purpose of these dams is flood control and during certain times of the year thousands of acre-feet of water can be stored in reservoirs behind them. In the event of an earthquake these dams may become vulnerable to damage or even catastrophic failure.

What We Don't Know

• Although there a no *identified* active faults in Lane County, some could exist unbeknownst to us. The Scott Mills earthquake occurred on a fault that at the time was unknown to experts.

• It is impossible to predict the extent of damages to critical infrastructure such as water systems, wastewater systems, utilities, roads, bridges, etc.

• It is unknown whether disaster recovery plans are in place in either the public or private sector. Anecdotal information suggests that most companies and government agencies in Lane County do not have Disaster Recovery or Continuity of Business / Operations Plans in place.

• It is difficult to pinpoint the exact locations of where landslides might occur in Lane County due to ongoing environmental changes. For example, a once barren hillside that was once the site of a landslide may today be covered over with brush and difficult to spot.

What Can Be Done

• Policies such as local ordinances can be put in place to regulate zoning, re-zoning and development on hillsides. The city of Salem is a good example of a local community that successfully passed such a law.

• Mitigation funding can be set aside to focus specifically on seismically retrofitting schools. In many cases there are only sections of the school that are particularly vulnerable (i.e., the cafeteria) making it cost-effective to retrofit just certain sections of the school instead of all school buildings.

• Evacuation planning could be performed to identify assembly areas and supply distribution sites.

• Topographic changes could be documented using Light Detection and Ranging (LIDAR) technology (a remote sensing system used to collect topographic data using aircraft-mounted lasers). After a baseline data set has been created, follow-up flights can be used to detect topographic changes to assist with pinpointing hazard-prone locations throughout Lane County.

• A minimal amount of funding could be provided to sustain Community Emergency Response Team (CERT) Programs. CERT Programs educate citizens about disaster preparedness for hazards that may impact their area and trains them in basic disaster response skills, such as fire safety, light search and rescue, team organization, and disaster medical operations. CERT members can assist others in their neighborhood or workplace following an event when professional responders are not immediately available to help.

• Continuity of Government / Business Plans could be developed to anticipate service interruption issues and to identify ahead of time how to be self-sustaining during an emergency or disaster.

• April is Earthquake Awareness Month. This could be an opportunity to for local governments to promote public education and outreach about earthquake preparedness.

• Participate in Cascadia Peril in April. Cascadia Peril is a statewide exercise that will simulate how communities and agencies across Oregon will be handling emergencies three days after a massive subduction zone earthquake that leaves more than 1,000 dead.

• Help support OWIN (Oregon's Wireless Interoperable Network). On June 27, 2008, the Oregon Legislature Emergency Board did not approve the $76 million in funding requested by OWIN necessary to build microwave, buildings, and towers in the Western half of Oregon in the effort to improve Oregon's outdated public safety communications capabilities. Governor Kulongoski is disappointed the funding request did not receive the majority vote necessary from the Senate members of the Emergency Board. Governor Kulongoski is planning another request for OWIN funding at the September 25-26, 2008, Emergency Board. It is important for Oregon to act now to prepare for implementation of a federal law change requiring the state to change its radio system from wideband to narrowband by 2013. Failure to do so can result in the loss of federal funding and retraction of previously approved radio frequencies resulting in significant setbacks to this effort.

• Work with the Army Corps of Engineers on understanding the latest information available regarding the current state of dams in Lane County. In particular, identify whether any dams or at greater risk than others of failure during an earthquake.

2009 Forest Protection Tour

From: MORGENSTERN Karl [mailto:Karl.MORGENSTERN@eweb.org]
Sent: Monday, July 06, 2009 9:20 AM
To: STEWART Faye H
Cc: 'Cary Hart'; Paul Wagner; HEUSER Jason; MORGENSTERN Karl; COOK Linda L
Subject: RE: Forest Protection Tour

Dear Commissioner Stewart,
As a Board member for the East Lane Forest Protection Association (ELFPA) I wanted to express our sincere thanks for your continued support in understanding the importance of planning for wild fire in Lane County and being proactive to reduce these threats in wildland urban interface areas. The East Lane Forest Protection Association would like to invite you on our 2009 summer tour on July 14th at 8am (starts at ODF office in Springfield) to take an in depth look at how SB 360 gets applied across the landscape, Lane County's role in this effort and see examples of fuels reduction on high and moderate rating sites (see attached agenda). This is a good opportunity for you to see how ODF and private landowners work together with Lane County to reduce the threat of wild fire and talk with folks on the ground that make this happen. We realize this invite is for something happening next week and apologize for the tardiness (we only finalized this tour last week), but still hope you can find the time to join us. Please let us know if you plan on attending or if you have any questions. Thanks and take care…km

Karl Morgenstern
Eugene Water & Electric Board
Drinking Water Source Protection Coordinator
P.O. Box 10148
Eugene, Oregon 97440
Phone (541) 341-8552
Fax (541) 984-4724

Meeting notes

Emergency Public Health and Medical Resource Management Planning Meeting

10/05/2009
2:00 PM to 3:30 PM
Carmichael Room, Lane County Juvenile Justice Center

Attendees: Howard Schesser, City of Cottage Grove; Jan Kinney & Linda Sherwood, Peace Health Siuslaw; Cathy Stone & Mark Groham, McKenzie Willamette; Wayne Johnson & Corinne Ginet Yeager, Peace Health Riverbend; Fred Lundgren, City of Springfield; Joe Rizzi, Eugene; Linda Cook, Lane County Emergency Management; Brian K. Johnson, Selene Jaramillo (note taker), Lane County Public Health

Phone: Maury Sanders, City of Florence; Kim Gibson, Peace Health Riverbend; Candace Barr, Jana Waterman, Lane County Medical Society; Glenda Koyama, Marsha, and Susan, Cottage Grove Hospital.

Overview of appropriate process to make a request for resources from local government agencies and Public Health:

- Brian Johnson shared information he learned at regional meeting on Friday, October 3 in discussion with Randy Shaw of the Oregon Public Health Division: for public health and medical requests it is appropriate for the request to go directly to the County, with a courtesy copy to the local city government. A Declaration of Emergency is NOT required to process a resource request for consumable supplies such as N95 masks. The Sheriff, as the local emergency management director has concurred that this process will be appropriate under the current H1N1 pandemic circumstances.

  Note: It was later discussed that resource shortages leading to altered standards of care for hospitals would require an emergency declaration. Examples of such resource shortages include lack of bed space, physicians and nurses.

- Two different situations reviewed:
  - Current H1N1 Pandemic request protocol:
    - Exhaust all available options. Hospital should then contact Linda Cook, Lane County Emergency Manager, via phone and email, courtesy copy to city and Lane County Public Health. Linda will respond in timely manner and redirect request if needed.
  - In elevated disaster situations, including escalation in the current pandemic intensity or severity (circumstances leading to altered standards of care at hospitals), and other broad impact disasters (like floods and earthquakes):
    - Use protocol and forms presented by Brian Johnson:
      - Exhaust all other options, then send formal Request for Assistance to Linda Cook and copy the city emergency manager where hospital is located, and Lane County Public Health.
      - Use forms ESF 8- Resource Request Form, and ICS Form 260 or equivalent.
- The Hospital will receive a response that the request has been received, and will get a final determination that may include:
  - when the item requested will be delivered
  - alternative to item requested
  - partial fulfillment of request
  - advice that request has been forwarded to the State
  - agency is unable to fulfill the request
- Linda proposed using National Weather Alert system language to indicate the level of need or urgency of a request or resource related communication, such as Alert, Watch and Warning. Alert to indicate that the communication is for informational purposes only and no action is required. Watch to indicate that a formal request may be required in the near future; Warning to indicate need for timely action.
- It was clarified that if the County, a City or the State provide assistance with resources to a Hospital, there is an expectation that the Hospital would pay for most resources received.
- Memoranda of Agreement or Understanding between Hospitals and Cities or other Government Agencies were

2010 Flood Mitigation Meetings

Flood Mitigation Meeting
Date: Thursday, August 26, 2010
Time: 1:30 p.m. - 3:30 p.m.

Agenda:

Situation Overview: Linda Cook, Lane County Emergency Management
Weather Outlook - Tyree Wilde, National Weather Service
Mapping / GIS Update - Eric Brandt, Lane Council of Governments
Public Information - Amber Fossen, Lane County
Public Works Projects - Michael Johns, Lane County Public Works
Emergency Notification Systems - Linda Cook, Lane County Emergency Management
Preparedness Actions - Linda Cook, Lane County Emergency Management

Actual Meeting Duration: 66min.

Attendees in person at Sheriff's Office Emergency Operations Center:
Amy Echols, Army Corps of Engineers
Dustin Bengston, Army Corps of Engineers
Jonna Hill, Lane County Sheriff's Office, Communications Center
Amber Fossen, Lane County Public Information Officer
Michael Johns, Lane County Public Works
Linda Cook, Lane County Emergency Management
Abby Andrus, Lane County Emergency Management

Attendees who reported in via teleconference:
Eric Brandt, Lane Council of Governments
Kevin Cardoza, Eugene Water & Electric Board
Sonny Chickering, Oregon Department of Transportation
Bill Clingman, Lane Council of Governments
Brian Conlon, City of Springfield, Public Works
Linda Cook, Lane County Emergency Management
Karen Gillette, Lane County Public Health
Chief Keith Hoehn, Lowell Rural Fire Protection District
Roger Kline, Army Corps of Engineers
Rick Little, Oregon Department of Transportation
Keir Miller, Lane County Land Management
Joe Rizzi, City of Eugene, Emergency Management
Annette Scarle, Lane County Risk Management
Jeremy Scherer, Lane County Land Management
Adam Vellutini, Lane County Transportation Planning
Ken Vogeney, City of Springfield
Kristi Wilde, Central Lane Communications Center (Eugene Police)
Tyree Wilde, National Weather Service

Situation Overview: Linda Cook, Lane County Emergency Management

- The Army Corp of Engineers (Corps) will be repairing spillway gates that will create an increased river flow earlier and higher than normal for longer than normal. In other words, they will be releasing storm water accumulation into rivers soon after each storm causing the rivers to run higher than we are accustomed to.

- The Corps will perform flood control measures as they always do and will be working to prevent flood conditions.

- Weather conditions will ultimately determine if flooding will occur (this is a wait-and-see situation similar to last year's H1N1 flu pandemic)

Weather Outlook - Tyree Wilde, National Weather Service

- The National Weather Service (NWS) looks at sea surface temperatures in the equatorial Pacific Ocean to predict seasonal forecast. From the sea surface temperatures the NWS determines if it will be an El Niño, La Niña, or a neutral state.
- Last year we were in an El Niño state which means we were warmer and dryer than normal.

- This year we are transitioning to La Niña which means we will likely be cooler and wetter than normal. The La Nina conditions should persist until well into 2011.

- Month to month temperature and precipitation projection:

  October, November, December - Temperature (undetermined)
  Precipitation will be wetter than normal

  January, February, March - Temperature will be below normal (colder)
  Precipitation will be wetter than normal

- Last La Niña was 2007-08. There were wind storms on the coast and significant flooding in NW Oregon and in Washington State.

- 1998-2001 were al La Niña years. In 1998-99 there was a good snow pack. The other years were fairly normal…showing us that all La Niña states do NOT behave the same.

- Stay informed on weather conditions: products to help with decision making:

  Outlooks/Watches/Warnings -

  Outlooks: 2-3 days before. If there will be heavy rains coming we let people know if possible flood potential

  Watches: 12hours before

  Warnings: when there is high confidence there will be flooding

  Get info from:

  National Weather Service website Weather.gov/Portland or,

  There is a free email subscription service (ask Linda Cook for Tyree Wilde's contact information and he can sign you up for the email subscription service)

- Dustin Bengston, Army Corps of Engineers offered additional resources:

The Corp directs people to Northwest River Forecast Center. Northwest River Forecast Center (co-located with National Weather Service; Corps works with NWS on products); Monitors river levels and projected flows.
The Corp's operations of the dam are fed back to NW River Forecast Center.

Willamette Valley Teacup Diagram is primarily used during summer conservation but you can see real time info from Corps dams

- Open discussion for Tyree (National Weather Service):

Joe Rizzi: Will you be doing the conference call updating that you had done in years past for larger than normal weather coming through?

Yes. When there is a high impact event coming in then there is a conference call held for the stakeholders

**
Linda Cook: What happened in 1964 to make that flooding so severe?

It was a similar setup to the '96 floods with rain on snow event. Rain on snow (both were transition from El Niño to la Niña years)

In 1964 there were fewer reservoirs in place and less dam control

**
Joe Rizzi: Did the 1964/1996 floods make it to the 100-yr level?

1996 flood: No
1964 flood: heaviest hit was south valley (1996 was more north valley). Flood control projects Cougar, Blue River, Foster and Green Peter dams were not online in 1964 flood

Mapping / GIS Update - Eric Brandt, Lane Council of Governments

- We are currently coordinating a group of GIS coordinators from Lane County, Eugene, and LCOG. Our goal is to identify if there is local information that would help the Corp with their project planning and to learn of data that the Corp had developed that could help us locally.
- So far we have learned that the Corp will be working on hydraulic model development with FEMA related to the 100-yr flood maps. As of now there are no hydraulic models for the mid-fork Willamette.
- Currently the Corp is referring to the FEMA maps, which represent the best available data at this time for flood planning purposes.
- Locally, no agency has their own set of models/maps.
- We do have localized and recent data including: LIDAR data, a 2008 orthophotography flight that covers the project data good and is good control data. We are happy to share the data with the Corps. We will assemble an inventory of local data assets and publish those datum but they are not useful for the lay person.

Linda Cook, Lane County Emergency Manager offered side notes.

- NO projection maps will be available (depicting flood stage 1, 2, 3 feet above flood stage) that we had hoped to get and that were discussed in previous meetings.
- In terms of maps to use for emergency planning, we will be referring the public to the 100-yr fema flood maps when determining if their residence is in the flood plain.

Public Works Projects –

Michael Johns, Lane County

- No projects currently of concern; prepared for flood

- Is there a map that could be put together as the event occurs?

  Brandt: No plans exist to do that but we do have data to support putting together reasonable maps. LIDAR has limitations due to vegetation such as blackberry bushes along banks appearing as though the ground is 3 feet higher than it is. It would be best to go to own agency first to see what they can do for you…but we will talk about doing something like that.

Brian Conlon, City of Springfield

- City of Springfield has a lot of work going on in the Gateway area and we also have a Regional Hospital that was constructed post '1996 (flood) so we have a real interest in getting information about that area.
- Springfield Public Works will begin meeting next week with maintenance and land survey staff to get a handle on what we know so far; we will be looking at historical data of high water events in the last 20 years.
- Springfield Public Works has committed to a sandbagging planning event.
  Lane County received a donation of 90,000 seed bags that can double as sandbags. Springfield PW has agreed to store them at their facility and the Corps will host a sandbagging workshop. Friday Oct 1st Les Miller from the Corps would put on the event for public agencies and the following day would be the same thing for local citizens.
- We are taking a cautious approach not to alarm the public at this time and would like to collaborate with other local agencies before releasing any media to the public. We would like to do a combined information release.

Linda Cook, Lane County Emergency Manager offered side notes:

- Reason we are focusing on Springfield so heavily is because of the way the river runs. It runs differently through Springfield than in Eugene…in Eugene it runs through a channel whereas in Springfield it does not. Focusing on Jasper, Lowell, possibly Cedar Flats areas.

Emergency Notification Systems -

Linda Cook, Lane County Emergency Management

- The Sheriff's Office Communications Center uses the Emergency Alert System (EAS). The emergency message goes out over TV and radio. A pre-recorded script is used to launch a message. The person wishing to launch a message must be authenticated as having the authority to do so. The Emergency Alert System is used for federal and state emergencies and can also be used for local emergencies.
- Lane County is In the process of entering into an intergovernmental agreement with Benton and Linn Counties who currently do not have EAS notification systems of their own so we are going to be launching messages for them as well and so there may be some overlap in sending emergency messages…more to come on that later…

Kristi Wilde, Central Lane Communications Center

- Community Emergency Notification System (CENS) "Reverse 9-1-1" involves sending a recorded message via telephone to a specific geographic location. Gives us the ability to take a map and select a specific area or take a pre-identified area and quickly identify telephone landlines in that area and send a recorded message. Really easy to do pre-planning with the CENS system.
- Would like to pre-plan /map areas of concern for flood in advance and give them a name and put them into the system, establish thresholds and determine authority for sending out the message.
- CENS is able to notify 1000's of people within minutes.

- Hoping to use anecdotal information from local agencies for flooding from years past for establishing maps for CENS pre-plans.

- CENS does not notify Cell phone users.

Preparedness Actions - Linda Cook, Lane County Emergency Management

- Sandbagging Event October 1 and 2 (Corps and Springfield Public Works)

- Corps will work with Lane County to put on town hall meetings (deciding on 1 or 2 meetings) one in Springfield and possibly second in River Road area where there is occasional flooding. More to come on that…

- Lane County is working with the National Weather Service on a town hall meeting for the lower McKenzie River area. NWS is trying to determine a reasonable way to set a flood stage for them. Working with residents to identify what a flood stage should look like on the McKenzie River.

- Note for public agencies – it is important to keep a good accounting of any emergency response expenditures in the event that federal reimbursements become available. Need a good record of where your money is going to be eligible…just a reminder. City of Springfield has already set up a program account code for this coming storm season.

Public Information - Amber Fossen, Lane County and others

Linda Cook: In response to the Register Guard article regarding the work the Corps is doing on the spillway gates this year; the media has contacted Lane County for a news release. Should we put something out now or stand down…we have to have a unified message. Is there anyone concerned about Lane County releasing a statement to the media?

No…just as long as all PIO's are talking with one another so we all have the same message.

Chief Hoehn: Please include the rural area as well (don't just emphasize the big cities).

Amber Fossen: Reminded the group that she is the lead contact for news releases.

Rick: ODOT …timing of news release is important in response to the Register Guard article in order to show all of the various agencies are prepared and working together. Also, we should dedicate a specific website as the go to site for all information.

Lane County Emergency Management will be the "go to" website; will work to make it more up front for weather monitoring, flood preparedness, etc.

Kier Land Management: Annual outreach by Lane County Land Management for Community Rating System; required to mail out a letter to all land owners in the flood plain, talks about flood insurance, know where your house is located, etc…will go out end of September (all over lane county). We should include something on the Corps work that will be going on…

Amy Echols: Regarding Register Guard reporter Sue Palmer, the story she ran was earlier than we had asked…she did not mention efforts for collaboration but is aware and says she will run more articles in the future. She also said she will run articles on what the public can do to prepare for a possible flooding.

FLOOD PLANNING WORKSHOP AND HANDS-ON SANDBAG TRAINING

Please join the City of Springfield, the Lane County Sheriff's Office and U.S. Army Corp of Engineers for a Flood Planning Workshop

Date: Same classes offered both dates – choose one or both sessions on either date
Friday October 1, 2010 / Saturday October 2, 2010

Time: Morning Session: 9 am – 12 pm / Afternoon Session: 1 pm – 3 pm

Location: City of Springfield, Public Works Maintenance Division
201 S. 18th Street, Springfield, OR 97477

*****Space is limited to 50 people per day*****
Please RSVP via email to: prepare@co.lane.or.us or call 541-682-6744

Morning Session: Managing a Flood Fight (9 am – 12 pm)

Who Should Attend: Strike team and task force leaders such as Incident Commanders, ICS Planning Chiefs, ICS Operations Chiefs, Public Works Managers and Supervisors, Public Safety Managers and Supervisors, Utility Managers, Facility Managers, Emergency Managers

What You Will Learn: How to plan and conduct a flood fight

Format: Classroom lecture and participant involvement

What to Bring: If you have them, maps showing your facility locations and flood related plans or policies

Afternoon Session: How to Sandbag (1 pm – 3 pm)

Who Should Attend: Property and business owners in flood prone areas; CERT Team leaders and other volunteer agency leaders; first responder field personnel who would be charged with leading a crew in a sandbagging effort

What You Will Learn: How to fill and use sandbags so you can lead others

Format: Classroom briefing followed by a short walk to outside hands-on training

What to Wear: Please check the weather and dress appropriately to work outside filling and moving sandbags. We will first assemble in a classroom and then take about a 4 minute walk to the sandbagging area.

What to Bring: Protective eye wear and gloves

We look forward to seeing you there!

Every year is a good year to prepare for a flood

This is a template that all attendees were asked to complete in an effort to mitigate the impacts of potential flooding and to update it each year.

Flood Response Plan for: _____(agency)
Prepared by: _____(lead contributor)
Date _____(period of time covered by plan)

Purpose

1. Purpose of this plan is to specify methods for early recognition of floods and dissemination of warnings which are accurate, timely, and reliable; and

2. To prevent injury and loss of life due to flooding and flood related causes.

3. To reduce public and private property damages from flooding and flood related causes.

Current Weather Outlook (winter 2010-2011)

- Transitioning from El Nino to La Nina conditions
- Above average rain Oct – Mar
- Cooler than normal temperatures Jan – Mar

Type of Flooding this Plan Addresses

☐ Surface Water Flooding (Drainage Systems) ☐ Coastal Flooding

☐ River and Stream Flooding ☐ Other

Collaborating Agencies: *Based on the roles of other agencies, who do you need to collaborate with to effectively accomplish your mission.*

Mutual Aid Agencies: *In the event that your resources are exhausted, who can you turn to for mutual aid?*

Monitoring Weather and Conditions

- ☐ **National Weather Service Online Tools** _____ (*assigned to*)
- ☐ **NOAA Weather Radio** _____ (*assigned to*)
- ☐ **Newspapers and Periodicals** _____ (*assigned to*)
- ☐ **Ground Patrols and Observations** _____ (*assigned to*)
- ☐ **Physical Inspections** _____ (*assigned to*)

Triggers for Response Actions

Vulnerabilities

Response Priorities

Resources

Notification and Alerts

Appendix D – Results of High Water Location Tour

MEMO

To: The Record
From: Philip Carpenter
Date: August 13, 2010
Subject: Lane County Roads

On August 12, 2010, I met with Linda Cook, Emergency Manager, Lane county Sheriff's Office, and Mike Russell, Senior Engineering Associate, Lane County Department of Public Works, to discuss a potential Pre-Disaster Mitigation project related to County roads that consistently experience flooding.

Linda explained that the Corps of Engineers plans to release 15 % more of the inflow to the Middle Fork Willamette River Dexter, Lookout Point, and Hill Creek Dams during the upcoming winter season in order to repair the dam gates. She is concerned that the increased flow will cause an increase in the flooding of several of the County's roads. Dan referred to the list of County roads previously provided OEM (attached) and noted that most of the roads would not be effected by the Corps of Engineers activities.

I discussed some of the factors that would be required for the cost/benefit study including:

- frequency and nature of past flood damages,
- length and duration of detours caused by past flood events,
- past repair costs from flood events,
- traffic control costs during past flood events.
- traffic counts, and
- proposed mitigation measures with costs and timelines.

We then visited the following sites:

<u>Love Lake Road # 3110—Priority 2</u>
Low spot in road occurs under dual rail road bridges. Flood flows are from the Willamette River about ½ mile to the east and along the rail road ditches and overland across fields. Mitigation measures would probably include raising the rail roads and their approaches at great expense, constructing an overpass over the rail roads at great expense, or raising road bed of the road approaches and between the bridges to a level that would accommodate at grade crossings at somewhat less expense. Getting a favorable benefit/cost value may be difficult. See two photographs below.


VERTICAL
CLEARANCE 7'2"
Lane County Roads
Love Lake Road 3110
Flood area under dual rail roads
Raise rail roads, construct road
overpass, or construct fill with at
grade crossings
August 12, 2010


Lane County Roads
Love Lake Road 3110
Flooding source--Willamette River
Flood area under dual rail roads
Raise rail roads, construct road overpass, or
construct fill with at grade crossings
August 12, 2010

Hayes Lane #3120—No priority given

There are at least 3 low spots on this dead end road. One of the low spots is about ¼ mile long where the road crosses Spring Creek. Flooding is from the Willamette River and Spring Creek There are approximately 50 homes dependent on the road for normal and emergency access. The photos below show the low spots and a flood pole erected in the far end low spot. Mitigation would be to raise the road bed at the low spots and to provide culverts for cross drainage.


HIGH FLOOD WATER
6 6
5 5
4 4
3 3
2 2
1 1
0 0
Lane County Roads
Hayes Lane 3120
Flood pole in low spot
August 12, 2010


4 FT
4 FT
Lane County Roads
Hayes Lane 3120
Flood pole in low spot
January 09 flood level
August 12, 2010

Riverview Drive #3135—No priority given
Typical low spot that flood from the Willamette River. Mitigation would be to raise road bed with cross drainage culverts (see typical photograph above for Hayes Lane)

Cross Road Lane West # 1650—Not on list and no priority given.
Typical low road that flood from the Willamette River. Mitigation would be to raise ½ mile (+ or -) road bed with cross drainage culverts (see typical photograph below for Coleman Road).

Herman Road #1625—Priority 2
Typical low road that flood from the Willamette River. Mitigation would be to raise ½ mile (+ or -) road bed with cross drainage culverts (see typical photograph below for Coleman Road).
Coleman Road #1628—Priority 1
Typical low road that floods. Mitigation would be to raise ½ mile (+ or -) road bed with cross drainage culverts. See photograph below.

Edenvale Road # 6068—Priority 2

Typical low road that floods from Middle Fork Willamette River. Flood issues for this portion of the road will be exacerbated due to the Corps of Engineer dam improvement work. Mitigation would be to raise ½ mile (+ or -) road bed with cross drainage culverts (see typical photograph above for Coleman Road).

Parvin Road # 6122—Priority 1

Typical low spots that flood on both sides of a historic bridge crossing Anthony Creek. The bridge is being raised 1 foot because of past floating debris damage. Mitigation would be to raise road bed with cross drainage culverts.

Site visit summary

Most of the flooding of the Lane County roads occurs in low spots or short segments of roads. Emergency access is the primary concern related to the periodic flooding. Residential settlements often are located at the end of one-way roads that flood. Mitigation for these roads would be to raise the road bed and install cross culverts.

Raising low spots and/or short segments of Lane County roads will require an evaluation (E.O. 11988) of the effect on the adjacent floodplains and Environmental/Historic Preservation reviews. In some situations detailed hydraulic analysis may be required to evaluate these floodplain effects. If the roads to be raised are in mapped floodplains CLOMRs may required.

Appendix E – Public Involvement Activities

As discussed on page 7 under the Plan Update Process section, Lane County's mitigation plan updates included several efforts to seek public input into the planning process. This appendix includes examples of those efforts.

- A special page on the Lane County Emergency Management website was established (www.lanecounty.org/prepare) to solicit public input. The entire document is available for download and an on-line form makes it easy to submit comments.

- Plan elements were discussed during public education and outreach activities. For example, the historical occurrences of some storm events were not found in early drafts. After discussion with the attendees at outreach events about their memories of past incidents committee members were able to refine their research efforts to improve the historical record of past occurrences.

- A news release was issued on Friday, February 17, inviting all members of the public to comment on the Plan Update either via the website, via email, by attending the public meeting or by contacting Lane County Emergency Management directly. A copy of the news release can be found on the next page.

- A public meeting was held on March 1, 2012 to solicit input to the final draft before going to the Board of County Commissioners for final approval.

COOK Linda L

From: COOK Linda L
Sent: Friday, February 17, 2012 3:50 PM
To: COOK Linda L; *LC News Broadcasters; *LC Department Directors; *Lane LCSO Briefing
Subject: For Immediate Release

LANE COUNTY SHERIFF'S OFFICE
Thomas M. Turner, Sheriff
125 E. 8th Avenue
Eugene, OR 97401
Phone: 541-682-4150
Fax: 541-682-4522
Email: sheriff's office@co.lane.or.us

NEWS RELEASE
www.lanesheriff.org

CASE NUMBER: N/A
DATE / TIME OF INCIDENT: 3:30 p.m.
DATE / TIME OF RELEASE: Hazard Mitigation Plan Review - Public Meeting
NATURE OF STORY:

LOCATION:

DETAILS:

Lane County Emergency Management announces the completion of the five year update to the *Lane County Natural Hazards Mitigation Plan*. This has been a year-long effort that reviewed the major hazards to which the County is exposed: snow/ice storms, flood, windstorm, wildfire, earthquake, tsunami and landslides.

A variety of measures have been identified that can reduce exposures to the dangers and damage posed by the hazards along with 12 action items to be implemented by the County. The resulting Plan is available for review on the Sheriff's Office emergency management website, www.lanecounty.org/prepare. A public meeting will be held at 10:00 a.m., Thursday, March 1, 2012 at Lane County Public Works, Training Room 3.

Comments on the Plan may be submitted via an on-line form at lanecounty.org/prepare; via email to prepare@co.lane.or.us; at the public meeting; or to:

Linda Cook
Lane County Sheriff's Office, Emergency Management
125 E. 8th Avenue
Eugene, OR 97401

The Mitigation Coordinating Committee will meet after the public meeting, review any desired changes, and recommend a final draft of the Plan Update for adoption by the Board of County Commissioners.

Prepared by: Linda L. Cook 541-914-0267

Addendum 1 – Interpretive Map Series, IMS-24

In 2008 the Oregon Department of Geology and Mineral Industries (DOGAMI) published an extensive study on the primary geologic hazards of Yamhill, Marion, Polk, Benton, Linn and Lane Counties. Included in this report are earthquake and landslide hazard maps for each county along with future earthquake damage estimates. This study is called *Interpretive Map Series, IMS-24, Geologic Hazards, Earthquake and Landslide Hazard Maps, and Future Earthquake Damage Estimates.* Appendix C of the DOGAMI report is specific to Lane County and is therefore included in its entirety as an Addendum to this Natural Hazards Mitigation Plan Update.

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