

# Section 2

## Community Profile

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

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

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

### History of Natural Hazards in Lane County

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

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

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

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

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

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

## **Geography and Climate**

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

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

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

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

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

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

## Population and Demographics

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

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

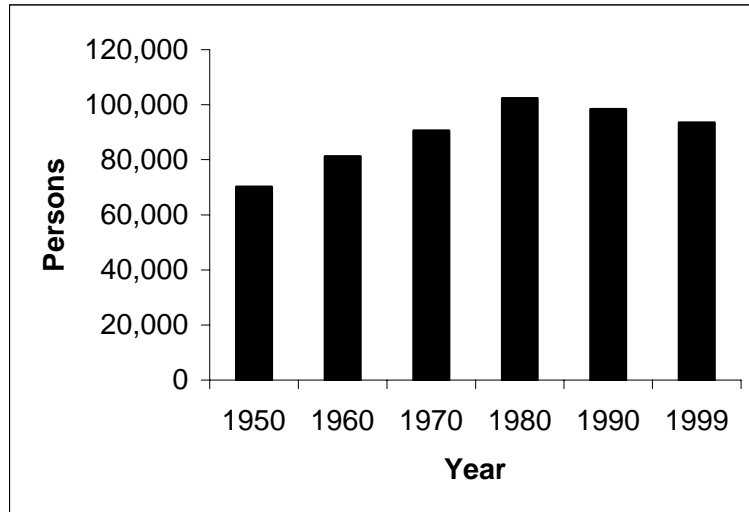
**Table 2.1: Population Growth, Lane County, 1950-2000**

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

Source: 2000 US Census

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

**Figure 2.1: Rural Population Trends**



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

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

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

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

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

Source: 2000 US Census

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

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

Source: 2000 US Census

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

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

Source: 2000 US Census

## **Employment and Economics**

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

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

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

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

Source: 2000 US Census

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

## Housing in Lane County

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

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

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

Source: 2000 US Census

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

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

Source: 2000 US Census

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

## Land and Development

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

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

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

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

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

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

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

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

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

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

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

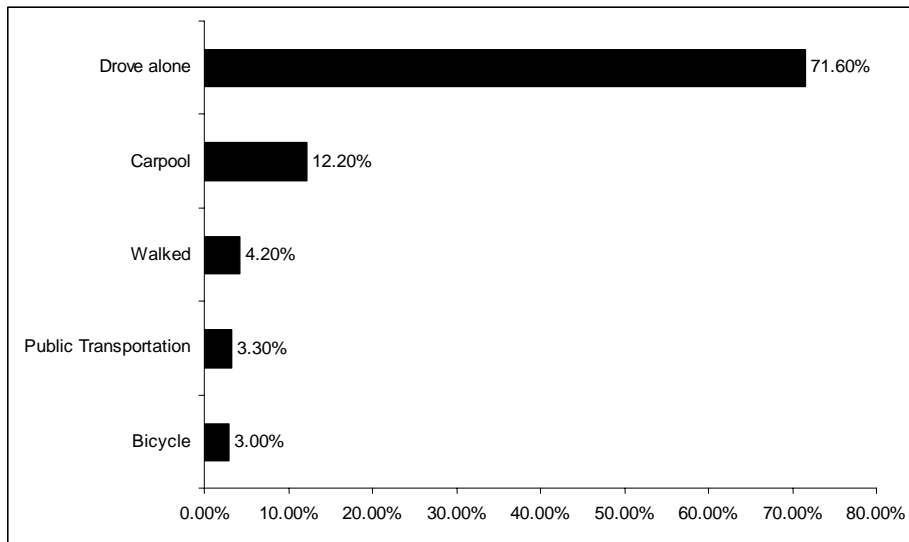
The County does evaluate emergency access when considering development. For the most part (with few exceptions), developers are required to build dwellings near the roadway, partly to provide easier access for emergency vehicles. Larger development proposals must include a storm water management plan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

## **Transportation and Commuting Patterns**

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

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

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



Source: 2000 US Census

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

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

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

## Critical Facilities and Infrastructure

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

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

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

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

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

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

## Historic and Cultural Resources

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

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

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

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

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