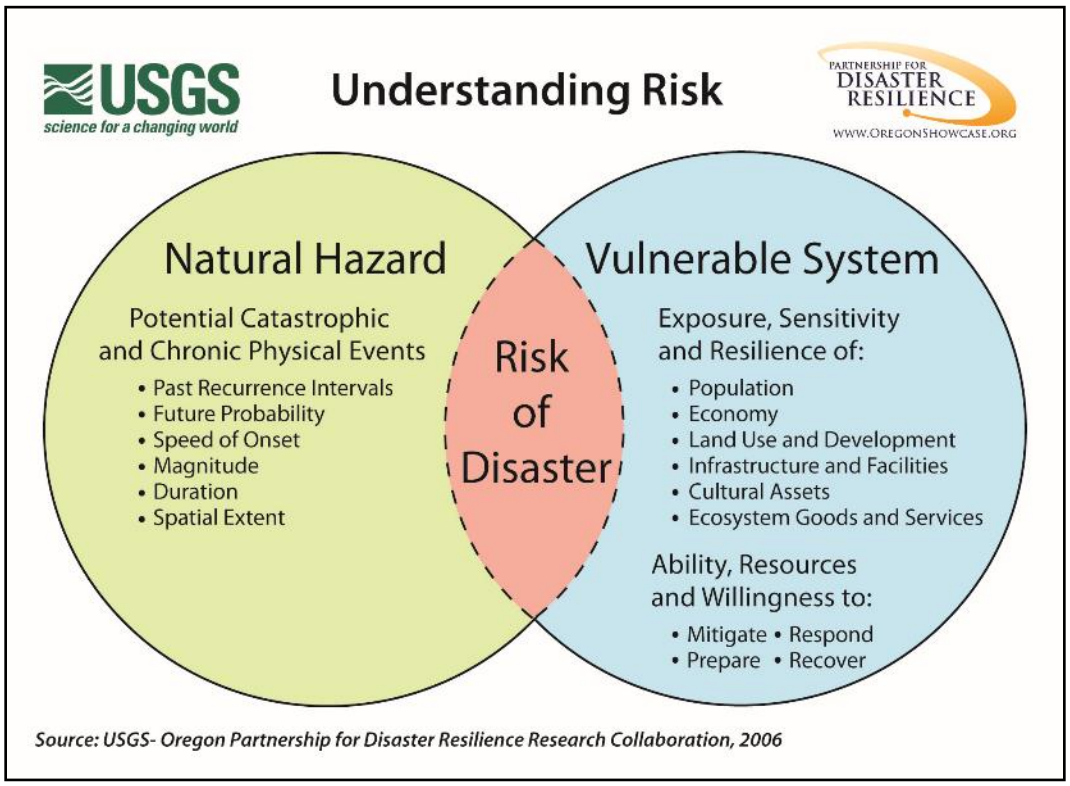
APPENDIX B: COMMUNITY PROFILE

Community resilience can be defined as the community's ability to manage risk and adapt to natural hazard impacts. In order to help define and understand the county's sensitivity and resilience to natural hazards, the following capacities must be examined:

The Community Profile describes the sensitivity and resilience to natural hazards of Polk County, and its incorporated cities, as they relate to each capacity. It provides a snapshot in time when the plan was developed and will assist in preparation for a more resilient county. The information in this section, along with the hazard assessments located in Section 2 – Risk Assessment, should be used as the local level rationale for the risk reduction actions identified in Section 3 – Mitigation Strategy. The identification of actions that reduce the county's sensitivity and increase its resiliency assist in reducing overall risk of disaster, the area of overlap in the figure below.

Figure B-1 Understanding Risk



Source: Oregon Partnership for Disaster Resilience

Natural Environment Capacity

Natural environment capacity is recognized as the geography, climate, and land cover of the area such as, urban, water and forested lands that maintain clean water, air and a stable climate.[1] Natural resources such as wetlands and forested hill slopes play significant roles in protecting communities and the environment from weather-related hazards, such as flooding and landslides. However, natural systems are often impacted or depleted by human activities adversely affecting community resilience.

Location, Geography, History

Polk County is located in the lower northwestern part of Oregon within the Mid-Willamette Valley between the Coastal Range and the Cascade Range (see Map B-1). The county was officially created from the Yamhill District of the Oregon Territory on December 22, 1845. On August 13, 1848, President James K. Polk signed a bill approving the boundaries of the Oregon territory, which officially separated the territory from England.

The present area of Polk County comprises 472,960 acres (739 square miles). Elevations within the county range from 325 feet in the east to 3,450 feet near Sugarloaf Mountain in the west. The western half of the County is timbered, with the eastern half as prairie or farmlands.

Further settlement from eastern United States migrations began in the early 1840's, one of the earliest settlements is near the present site of Dallas. Jason Lee was the vanguard of this settlement, having established his mission at Wheatland on the east bank of the Willamette River in 1834.

The County seat was located at Cynthian (later Dallas) in 1850. A new courthouse was completed in 1860 and destroyed by fire in 1898 and the present courthouse was completed in 1900. The City of Dallas is the northern most incorporated jurisdiction located centrally within the county.

The City of Independence was named after Independence, Missouri by E.A. Thorp, a former resident of the Missouri city who platted the town in 1850. The site began to be settled in 1845. Located close to the eastern border of the county, the City of Independence is a close neighbor to the City of Monmouth.

The City of Monmouth was founded in 1853 by settlers from Monmouth, Illinois in August, 1852 who spent their first winter at a point about three and one-half miles north-northeast of Rickreall. Monmouth University, now known as Western Oregon State College, was originally founded in 1858.

Falls City, named for the historically prominent falls was originally named both Syracuse and Luckiamute Falls. In 1891, when the town was incorporated, the name was changed. However, due to the dual origin, there are two "Main Streets" in town – North and South Main Street run parallel to each other on either side of the river. Historical photos show a power plant constructed at the top of the falls, and records indicate a sawmill operation

[1] Mayunga, J. 2007. Understanding and Applying the Concept of Community Disaster Resilience: A capital-based approach. Summer Academy for Social Vulnerability and Resilience Building.

operated by John Thorpe in 1852. The elevation at the falls is approximately 300 feet. Falls City is located centrally in the county.

The Grand Ronde Indian Reservation was formed in 1856 combining settlements from several Willamette Valley Indian tribes as well as Indians from other parts of Oregon. The reservation is located in northwestern Polk County as well as southwestern Yamhill County. More than 1,000 Indians were on the reservation at one time during the 1860's. The reservation was divided in 1908 among the various Indians residing there. The Grand Ronde Agency was terminated in 1925 with the U.S. Federal Government maintaining supervisory control over the remaining 500 acres of reservation land until 1957.

River navigation, agriculture, timber, and livestock all contributed to Polk County's development, economy, industry, and trade activities during its early history. World War II changed the county's land use focus towards more residential or other urban uses. Agricultural land was decreasing rapidly requiring the County to allocate agricultural and timber land to preserve the industries.

Climate

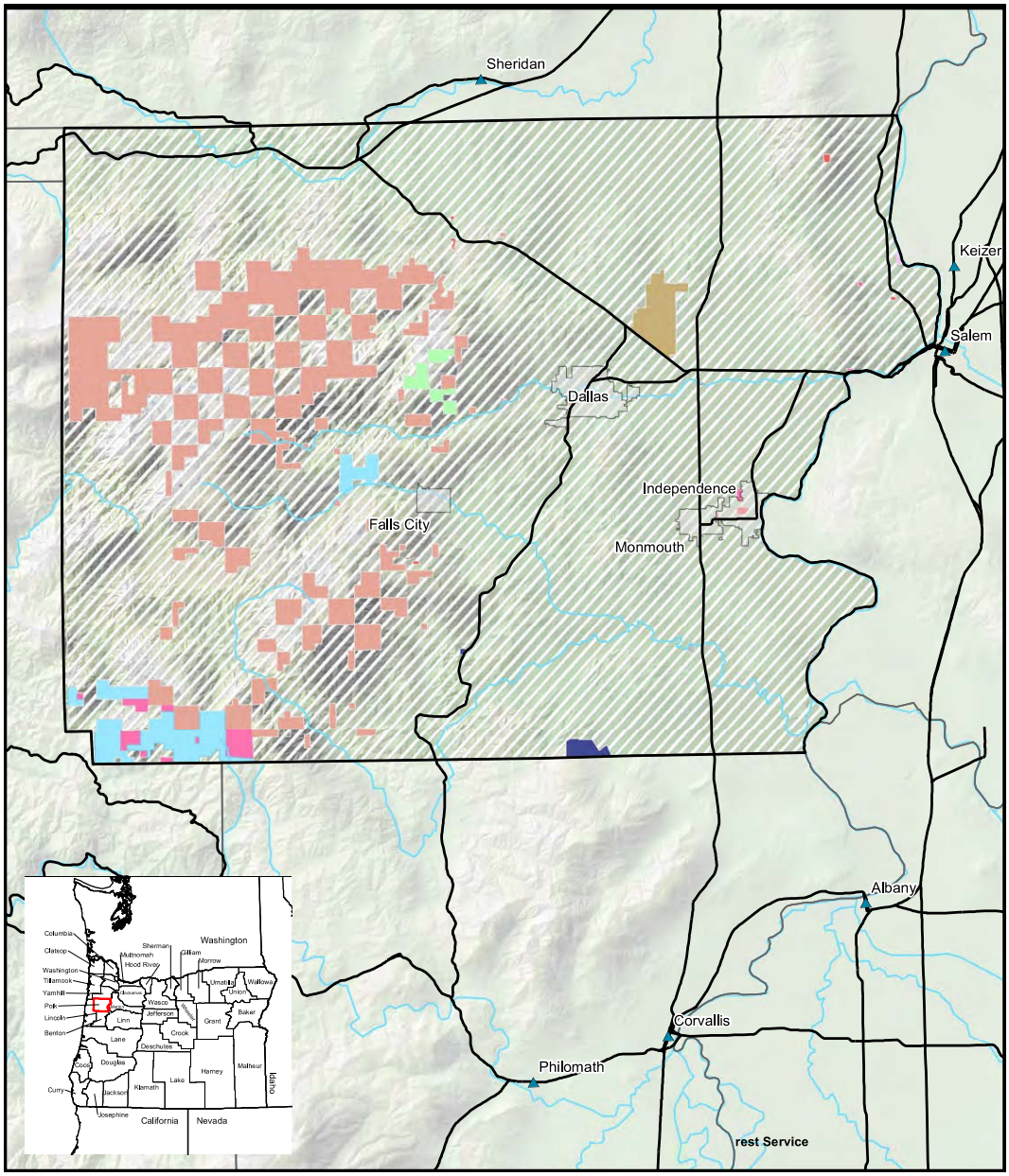
Polk County has a modified marine climate where winters are cool and wet, while summers are moderately warm and dry. Cool air flows west from the Pacific Ocean and is tempered by the Cascade Mountains to the east. From 1961 to 1990, the average annual precipitation in Polk County was approximately 52 inches with most received in the Coast Range and gradually decreasing eastward toward the Willamette Valley floor. The Laurel Mountain Weather Station, located at an elevation of 3,589 feet in the Coast Range west of Falls City, was established in 1970. Between 1970 and 2000, average annual precipitation recorded at the station was about 121 inches. A total of 204 inches was recorded during the winter of 1996-97. In the Mid-Willamette Valley, 90 percent of the rainfall is experienced between October and the end of May.

Total precipitation in the Pacific Northwest region may remain similar to historic levels but climate projections indicate the likelihood of increased winter precipitation and decreased summer precipitation.

Increasing temperatures affects hydrology in the region. Spring snowpack has substantially decreased throughout the Western part of the United States, particularly in areas with milder winter temperatures, such as the Cascade Mountains. In other areas of the West, such as east of the Cascades Mountains, snowfall is affected less by the increasing temperature because the temperatures are already cold and more by precipitation patterns.[2]

[2] Mote, Philip W., et. al., "Variability and trends in Mountain Snowpack in Western North America," http://cses.washington.edu/db/pdf/moteetalvarandtrends436.pdf

Map B-1 Location and Land Ownership



Source: Polk County NHMP (2009).

Hazard Severity

Dynamic weather combined with the diverse geography across Polk County are indicators of hazard vulnerability when combined with the changing climate and severe weather related events. Both wet and dry cycles are likely to last longer and be more extreme, leading to periods of deeper drought and more frequent flash flooding. Less precipitation in the summers and subsequently lower soil moisture with hotter temperatures will likely increase the amount of vegetation consumed by wildfire.

Synthesis

The physical geography, weather, climate and land cover of an area represent various interrelated systems that affect overall risk and exposure to natural hazards. The projected climate change models representing Western Oregon indicate the potential for increased effects of hazards, particularly drought and wildfire due to changing climate of the region. Western Oregon is projected to have warmer and drier summers with less precipitation. In addition, winter temperatures will be warmer, which means a decrease in mountain snowpack. These factors combined with periods of population growth and development intensification can lead to increasing risk of hazards, threatening loss of life, property and long-term economic disruption if land management is inadequate.

Social/Demographic Capacity

Social/demographic capacity is a significant indicator of community hazard resilience. The characteristics and qualities of the community population such as language, race and ethnicity, age, income, educational attainment, and health are significant factors that can influence the community's ability to cope, adapt to and recover from natural disasters. Population vulnerabilities can be reduced or eliminated with proper outreach and community mitigation planning.

Population

Polk County's population grew 4.1% from 2010 to 2015, Dallas and Salem (portion in Polk County) had the fastest growth rate at 3.1% and 5.1% respectively, while the unincorporated areas of the county outpaced them all ay 6.7%. The western part of Salem (25,542), Dallas (15,040), and the unincorporated parts of the county (17,775) are the county's most populous. The unincorporated area of the county accounts for about 22.6% of the overall population and is growing faster than the largest cities (1.31% AAGR).

Oregon's state-wide land use planning policies require local jurisdictions to manage growth using an urban growth boundary, which contains most new growth inside of incorporated areas. Since 2010 the unincorporated area of the county grew faster than almost all of the incorporated cities; reversing the trend from previous years when incorporated areas grew faster. Although the trend reversed the growth in these areas does emphasize the importance of partnerships between the county and the cities for effective county-wide mitigation efforts.

Table B-1 Population Estimates for Polk County and Cities

Jurisdiction	2010		2015		Change (2010-2015)		AAGR
	Number	Percent	Number	Percent	Number	Percent	
Polk County	75,495	100%	78,570	100%	3,075	4.1%	0.80%
Dallas	14,590	19.3%	15,040	19.1%	450	3.1%	0.61%
Falls City	945	1.3%	950	1.2%	5	0.5%	0.11%
Independence	8,600	11.4%	8,775	11.2%	175	2.0%	0.40%
Monmouth	9,545	12.6%	9,640	12.3%	95	1.0%	0.20%
Salem*	24,312	32.2%	25,542	32.5%	1,231	5.1%	0.99%
Willamina*	845	1.1%	848	1.1%	3	0.3%	0.07%
Unincorporated	16,658	22.1%	17,775	22.6%	1,116	6.7%	1.31%

Source: Portland State University, Population Research Center, "Annual Population Estimates", 2015.
* - Portion of city within Polk County.

The Office of Economic Analysis' Long-term County Population Forecast projects that by 2035 Polk County's population will increase to over 113,000, a 44% increase from the 2015 estimate.[3]

[3] Office of Economic Analysis. Long Term County Population Forecast, 2010-2050 (2013 release).

Tourists

Tourists are not counted in population statistics; and are therefore considered separately in this analysis. Tourists are specifically vulnerable due to the difficulty of locating or accounting for travelers within the region. Tourists are often at greater risk during a natural disaster because of unfamiliarity with evacuation routes, communication outlets, or even the type of hazard that may occur. Knowing whether the region's visitors are staying in friends'/relatives' homes in hotels/motels, or elsewhere can be instructive when developing outreach efforts.[4] For hazard preparedness and mitigation purposes, outreach to residents in Polk County will likely be transferred to these visitors in some capacity. Visitors staying at hotel/motels are less likely to benefit from local preparedness outreach efforts aimed at residents.

Vulnerable Populations

Vulnerable populations, including seniors, disabled citizens, women, and children, as well those people living in poverty, often experience the impacts of natural hazards and disasters more acutely. Hazard mitigation that targets the specific needs of these groups has the potential to greatly reduce their vulnerability. Examining the reach of hazard mitigation policies to special needs populations may assist in increasing access to services and programs. FEMA's Office of Equal Rights addresses this need by suggesting that agencies and organizations planning for natural hazards identify special needs populations, make recovery centers more accessible, and review practices and procedures to remedy any discrimination in relief application or assistance.

Population size itself is not an indicator of vulnerability. More important is the location, composition, and capacity of the population within the community. Research by social scientists demonstrates that human capital indices such as language, race, age, income, education and health can affect the integrity of a community. Therefore, these human capitals can impact community resilience to natural hazards.

Language

Special consideration should be given to populations who do not speak English as their primary language. Language barriers can be a challenge when disseminating hazard planning and mitigation resources to the general public, and it is less likely they will be prepared if special attention is not given to language and culturally appropriate outreach techniques.

There are various languages spoken across Polk County; the primary language is English. Approximately 13% of the Polk County population speaks a language other than English, Spanish is the second most widely spoken language with about 10% of the population 5 years and over speaking Spanish (25% of the population of Independence speaks Spanish).[5] Overall, about 4.4% of the total population in Polk County is not proficient in English. Independence (11,4%) and Monmouth (5.5%) have the largest populations of residents who

[4] MDC Consultants (n.d.). When Disaster Strikes – Promising Practices. Retrieved March 18, 2014, from http://www.mdcinc.org/sites/default/files/resources/When%20Disaster%20Strikes%20-%20Promising%20Practices%20- %20Tourists.pdf

[5] U.S. Census Bureau, 2011-2015 American Community Survey, Table DP02.

have limited or no English language proficiency. Outreach materials used to communicate with, plan for, and respond to non-English speaking populations should take into consideration the language needs of these populations.

Table B-2 Polk County Language Barriers

	Population 5 years and over	English Only		Multiple Languages		Limited or No English	
		Number	Percent	Number	Percent	Number	Percent
Polk County	72,709	63,018	86.7%	9,691	13.3%	3,196	4.4%
Dallas	13,730	12,737	92.8%	993	7.2%	150	1.1%
Falls City	938	903	96.3%	35	3.7%	7	0.7%
Independence	7,883	5,815	73.8%	2,068	26.2%	899	11.4%
Monmouth	9,492	7,809	82.3%	1,683	17.7%	524	5.5%

Source: U.S. Census Bureau, 2011-2015 American Community Survey Estimates, Table DP02.

Race

The impact in terms of loss and the ability to recover may also vary among minority population groups following a disaster. Studies have shown that racial and ethnic minorities can be more vulnerable to natural disaster events. This is not reflective of individual characteristics; instead, historic patterns of inequality along racial or ethnic divides have often resulted in minority communities that are more likely to have inferior building stock, degraded infrastructure, or less access to public services. The table below describes Polk County's population by race and ethnicity.

The majority of the population in Polk County is racially white (79.7%); Independence and Monmouth have the largest percentages of non-white population. Individually, Independence supports a 34% Hispanic or Latino population while Monmouth supports 25%. Approximately 13% of the county population is Hispanic or Latino.

Table B-3 Polk Race and Hispanic or Latino Origin

Race	Polk	Dallas	Falls City	Independence	Monmouth
Total Population	77,264	14,896	994	8,772	9,869
White	79.7%	89.9%	88.0%	66.1%	75.1%
Black	0.7%	0.1%	0%	0.4%	1.5%
AIAN	1.0%	0.5%	2.0%	0.1%	0.6%
Asian	2.1%	1.6%	0.1%	0.6%	3.3%
NHPI	0.4%	0.1%	0%	0.4%	0%
Some Other Race	0.0%	0.0%	0%	0.0%	0.0%
Two or More Races	3.4%	2.6%	7.0%	3.8%	4.5%
Hispanic or Latino	9,910	772	28	2,503	1,482
Percent	12.8%	5.2%	2.8%	28.5%	15.0%

Source: Social Explorer, Table T12, U.S. Census Bureau, 2011-2015 American Community Survey Estimates
AIAN = American Indian and Alaskan Native, NHPI = Native Hawaiian and Other Pacific Islanders

It is important to identify specific ways to support all portions of the community through hazard mitigation, preparedness, and response. Culturally appropriate, and effective outreach can include both methods and messaging targeted to diverse audiences. For example, connecting to historically disenfranchised populations through already trusted sources or providing preparedness handouts and presentations in the languages spoken by the population will go a long way to increasing overall community resilience.

Gender

Polk County has slightly more females than males (Female 51.9%, Male: 48.1%).[6] It is important to recognize that women tend to have more institutionalized obstacles than men during recovery due to sector-specific employment, lower wages, and family care responsibilities.[7]

Age

Of the factors influencing socio demographic capacity, the most significant indicator in Polk County may be age of the population. Depicted in the table below, as of 2015, 16.4% of the county population is over the age of 64, a percentage that is projected to rise to 21.7% by 2035. The Polk County age dependency ratio[8] is 55.4 (Dallas has the largest age dependency ration at 70.3). The age dependency ratio indicates a higher percentage of dependent aged people to that of working age. The Oregon Office of Economic Analysis projects that, in 2035, there will be a higher percentage of the county population over the age of 64. As the population ages, Polk county may need to consider different mitigation and preparedness actions to address the specific needs of this group. The age dependency ratio for Polk County is expected to rise to 61.5 in 2035, largely because of the rise in the older age cohorts.

Table B-4 Polk Population by Vulnerable Age Groups

Jurisdiction	Total	< 15 Years Old		> 64 Years Old		15 to 64 Years Old	Age Dependency Ratio
		Number	Percent	Number	Percent		
Oregon	3,939,233	712,967	18.1%	606,877	15.4%	2,619,389	50.4
Polk County	77,264	14,887	19.3%	12,648	16.4%	49,729	55.4
Dallas	14,896	3,225	21.7%	2,922	19.6%	8,749	70.3
Falls City	994	159	16.0%	185	18.6%	650	52.9
Independence	8,772	2,232	25.4%	722	8.2%	5,818	50.8
Monmouth	9,869	1,628	16.5%	934	9.5%	7,307	35.1
2035							
Oregon	4,995,200	865,889	17.3%	1,082,781	21.7%	3,046,530	62.9
Polk County	113,348	20,994	18.5%	21,798	19.2%	70,556	61.5

Source: Social Explorer, Table 17, U.S. Census Bureau, 2011-2015 American Community Survey Estimates, Office of Economic Analysis, Long-Term County Population Forecast, 2010-2050 (2013 release).

[6] Social Explorer, Table 4, U.S. Census Bureau, 2011-2015 American Community Survey Estimates

[7] Ibid.

[8] The age dependency ratio is derived by dividing the combined under 15 and 65-and-over populations by the 15-to-64 population and multiplying by 100. A number close to 50 indicates about twice as many people are of working age than non-working age. A number that is closer to 100 implies an equal number of working age population as non-working age population. A higher number indicates greater sensitivity.

The age profile of an area has a direct impact both on what actions are prioritized for mitigation and how response to hazard incidents is carried out. School age children rarely make decisions about emergency management. Therefore, a larger youth population in an area will increase the importance of outreach to schools and parents on effective ways to teach children about fire safety, earthquake response, and evacuation plans. Furthermore, children are more vulnerable to the heat and cold, have few transportation options and require assistance to access medical facilities. Older populations may also have special needs prior to, during and after a natural disaster. Older populations may require assistance in evacuation due to limited mobility or health issues. Additionally, older populations may require special medical equipment or medications, and can lack the social and economic resources needed for post-disaster recovery.[9]

Families and Living Arrangements

Two ways the census defines households are by type of living arrangement and family structure. A householder may live in a "family household" (a group related to one another by birth, marriage or adoption living together); in a "nonfamily household" (a group of unrelated people living together); or alone. Polk County is predominately comprised of family households (68.0%). Of all households, 23.4% are one-person non-family households (householder living alone). Countywide about 11% of householders live alone and are over the age of 65 (about 15% of all households in Dallas).

Table B-5 Polk County Family vs. Non-Family Households

	Total Households	Family Households		Household Living Alone		Householder Living Alone (age 65+)	
Jurisdiction	Estimate	Estimate	Percent	Estimate	Percent	Estimate	Percent
Polk County	28,458	19,363	68.0%	6,672	23.4%	3,165	11.1%
Dallas	5,667	3,896	68.7%	1,432	25.3%	838	14.8%
Falls City	357	260	72.8%	78	21.8%	37	10.4%
Independence	2,932	2,055	70.1%	493	16.8%	140	4.8%
Monmouth	3,500	1,653	47.2%	1,007	28.8%	305	8.7%

Source: U.S. Census Bureau, 2011-2015 American Community Survey Estimates, Table DP02

The table below shows household structures for families with children. Nearly 20% of all households within the county are married family households that have children; Independence and Dallas have the highest percentages. Dallas (11.4%) and Independence (14.4%) have the highest percentage of single parent households. These populations will likely require additional support during a disaster and will inflict strain on the system if improperly managed.

[9] Wood, Nathan. Variations in City Exposure and Sensitivity to Tsunami Hazards in Oregon. U.S. Geological Survey, Reston, VA, 2007.

Table B-6 Polk County Family vs. Non-Family Households

Jurisdiction	Total Households Estimate	Married-Couple with Children		Single Parent with Children	
		Estimate	Percent	Estimate	Percent
Polk County	28,458	5,677	19.9%	2,129	7.5%
Dallas	5,667	1,062	18.7%	646	11.4%
Falls City	357	41	11.5%	27	7.6%
Independence	2,932	720	24.6%	421	14.4%
Monmouth	3,500	561	16.0%	157	4.5%

Source: U.S. Census Bureau, 2011-2015 American Community Survey Estimates, Table DP02

Income

Household income and poverty status are indicators of socio demographic capacity and the stability of the local economy. Household income can be used to compare economic areas as a whole, but does not reflect how the income is divided among the area residents. Between 2010 and 2015 the share of households making less than $15,000 increased more than other income cohorts; no other income cohort saw a gain.

Table B-7 Household Income

Household Income	2010^		2015		Change in Share	
	Households	Percent	Households	Percent	Households	Percent
Less than $15,000	2,904	10.5%	3,638	12.8%	734	2.3%
$15,000-$29,999	3,876	16.2%	4,479	15.7%	603	-0.4%
$30,000-$44,999	4,276	14.2%	3,929	13.8%	-347	-0.4%
$45,000-$59,999	3,785	13.7%	3,876	13.6%	91	0.0%
$60,000-$74,999	2,973	11.7%	3,228	11.3%	255	-0.3%
$75,000-$99,999	3,739	13.6%	3,753	13.2%	14	-0.4%
$100,000-$199,999	5,297	19.1%	4,987	17.5%	-310	-1.6%
$200,000 or more	840	3.0%	568	2.0%	-272	-1.0%

Source: Social Explorer, Table 56, U.S. Census Bureau, 2011-2015 American Community Survey and 2006-2010 American Community Survey
^ 2010 dollars are adjusted for 2015 using the Social Explorers Inflation Calculator.

The 2015 median household income across Polk County is $52,821; this is lower than the inflation adjusted 2010 figure, representing a 4.7% decline in real incomes. Dallas and Independence have the highest median household incomes, while Monmouth and Falls City have the lowest median household incomes. The table below shows decreases in real incomes across Polk County and cities.

Table B-8 Median Household Income

	Median Household Income		Percent
	2010^	2015	Change
Polk County	$55,433	$52,821	-4.7%
Dallas	$52,969	$48,843	-7.8%
Falls City	$43,588	$33,309	-23.6%
Independence	$50,304	$44,454	-11.6%
Monmouth	$39,516	$32,027	-19.0%

Source: Social Explorer, Table 57, U.S. Census Bureau, 2011-2015 American Community Survey Estimates and 2006-2010 American Community Survey Estimates
Note: ^ - 2010 dollars adjusted for 2015 via Social Explorer's Inflation Calculator

The table below identifies the percentage of individuals and cohort groups that are below the poverty level in 2015. It is estimated that about 16% of individuals, 19% of children under 18, and 7% of seniors live below the poverty level across the county. Falls City, Independence, and Monmouth have the highest poverty rates. Falls City has the highest poverty rate for children under 18. Overall, 8% of Polk County residents live in "deep poverty" (having incomes below half the federal poverty level), the percent is greatest in Monmouth at 20%.[10]

Table B-9 Poverty Rates

	Total Population in Poverty		Children Under 18 in Poverty		18 to 64 in Poverty		65 or over in Poverty	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Polk County	12,270	16.3%	3,378	18.9%	7,988	17.7%	904	7.2%
Dallas	2,449	16.7%	913	25.3%	1,287	15.8%	249	8.7%
Falls City	250	25.7%	84	44.0%	149	24.9%	17	9.2%
Independence	2,168	24.8%	650	26.5%	1,443	25.8%	75	10.8%
Monmouth	2,807	32.3%	391	22.5%	2,340	39.0%	76	8.1%

Source: Social Explorer Tables 114, 115, 116, U.S. Census Bureau, 2011-2015 American Community Survey Estimates

Cutter's research suggests that lack of wealth contributes to social vulnerability because individual and community resources are not as readily available. Affluent communities are more likely to have both the collective and individual capacity to more quickly rebound from a hazard event, while impoverished communities and individuals may not have this capacity –leading to increased vulnerability. Wealth can help those affected by hazard incidents to absorb the impacts of a disaster more easily. Conversely, poverty, at both an individual and community level, can drastically alter recovery time and quality.[11]

[10] Social Explorer Tables 117, U.S. Census Bureau, 2011-2015 American Community Survey Estimates

[11] Statewide Supplemental Nutrition Assistance Program Activity - Nov. 2014 (SSP, APD, and AAA combined); P. 3 of report. Temporary Assistance for Needy Families One and two Parent Families Combined; P. 3 of report. http://www.oregon.gov/dhs/assistance/Pages/data/main.aspx

Federal assistance programs such as food stamps are another indicator of poverty or lack of resource access. Statewide social assistance programs like the Supplemental Nutritional Assistance Program (SNAP) and Temporary Assistance for Needy Families (TANF) provide assistance to individuals and families. In Polk County, TANF reaches approximately 1,192 families per month and SNAP helps to feed about 10,428 people per month.[12] Those reliant on state and federal assistance are more vulnerable in the wake of disaster because of a lack of personal financial resources and reliance on government support.

Education

Educational attainment of community residents is also identified as an influencing factor in socio demographic capacity. Educational attainment often reflects higher income and therefore higher self-reliance. Widespread educational attainment is also beneficial for the regional economy and employment sectors as there are potential employees for professional, service and manual labor workforces. An oversaturation of either highly educated residents or low educational attainment can have negative effects on the resiliency of the community.

Approximately 88.6% of the Polk County population over 25 years of age has graduated from high school or received a high school equivalency, with 26.7% going on to earn a Bachelor's Degree. Independence (82.1%) and Falls City (86.5%) have the lowest percentages of high school graduates.

Table B-10 Educational Attainment

	Polk County	Dallas	Falls City	Independence	Monmouth
Population 25 years and over	49,104	10,041	719	4,506	4,734
Less than high school	4,274	737	92	757	350
High school graduate or GED	13,150	3,113	261	1,139	1,199
Some college, no degree	17,226	4,130	287	1,754	1,577
Bachelor's degree	8,879	1,465	48	605	974
Graduate or professional degree	4,236	455	26	200	473
Percent without Highschool Degree	*8.7%*	*7.3%*	*12.8%*	*16.8%*	*7.4%*
Percent High School Graduate or Higher	*88.6%*	*91.3%*	*86.5%*	*82.1%*	*89.2%*
Percent Bachelor's Degree or Higher	*26.7%*	*19.1%*	*10.3%*	*17.9%*	*30.6%*

Source: Social Explorer, Table 25, U.S. Census Bureau, 2011-2015 American Community Survey Estimates

Health

Individual and community health play an integral role in community resiliency, as indicators such as health insurance, people with disabilities, dependencies, homelessness and crime

[12] Sabatino, J. (2016). Oregon TANF Caseload FLASH, "One and Two Parent Families Combined", District 3 (Dallas); December 2016 data, and Sabatino, J. (2016). Oregon SNAP Program Activity, "SSP, APD and AAA Combined", District 3 (Dallas); December 2016 data. Retrieved from State of Oregon Office of Business Intelligence website: http://www.oregon.gov/DHS/ASSISTANCE/Pages/Data.aspx, January 2017.

rate paint an overall picture of a community's well-being. These factors translate to a community's ability to prepare, respond to, and cope with the impacts of a disaster.

The Resilience Capacity Index recognizes those who lack health insurance or are impaired with sensory, mental or physical disabilities, have higher vulnerability to hazards and will likely require additional community support and resources. Polk County has 10.3% of its population without health insurance; Monmouth (15.4%) has the highest percentage. The percentage of uninsured changes with age, the highest rates of uninsured are within the 18 to 64-year cohort; Monmouth has the highest percentage of this age group that is uninsured. The ability to provide services to the uninsured populations may burden local providers following a natural disaster.

Table B-11 Health Insurance Coverage

		Without Health Insurance							
		Total Population		Under 18 years		18 to 64 years		65+	
Jurisdiction	Population	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Polk County	76,884	7,934	10.3%	984	1.3%	6,907	9.0%	43	0.1%
Dallas	14,695	1,376	9.4%	193	1.3%	1,183	8.1%	0	0.0%
Falls City	994	134	13.5%	37	3.7%	97	9.8%	0	0.0%
Independence	8,737	920	10.5%	0	0.0%	920	10.5%	0	0.0%
Monmouth	9,863	1,520	15.4%	146	1.5%	1,361	13.8%	13	0.1%

Source: Social Explorer, Table 146, U.S. Census Bureau, 2011-2015 American Community Survey Estimates.

The table below describes disability status of the population. Approximately 14.7% of the Polk County civilian non-institutionalized population identifies with one or more disabilities. Falls City has the highest percentage of its total population with a disability (30.5%) and the highest percentage of individuals 65 years and over with a disability (54.1%). Independence has the highest percentage of individuals under 18 with a disability (8.5%).

Table B-12 Disability Status by Age Group

	Population	With a disability		Under 18 years with a disability		65 years and over with a disability	
	Estimate^	Estimate	Percent	Estimate	Percent*	Estimate	Percent*
Polk County	76,884	11,292	14.7%	846	4.7%	4,647	37.0%
Dallas	14,695	2,728	18.6%	136	3.7%	1,169	40.8%
Falls City	994	303	30.5%	8	3.8%	100	54.1%
Independence	8,737	974	11.1%	209	8.5%	249	35.8%
Monmouth	9,863	1,157	11.7%	67	3.9%	368	39.4%

Source: U.S. Census Bureau, 2011-2015 American Community Survey, Table DP02.
^ Non-institutionalized civilian population, * Percent of age group

The table below describes disability status of the population by type and age. Older populations tend to have more disabilities than younger populations in Polk County. Approximately 8.0% of the population has an ambulatory disability while 6.3% have a cognitive disability, and 6.2% have an independent living disability. More than 22% of the 65 and over population has an ambulatory disability. Depending on the type of disability outreach, mitigation, and response efforts may need to be adjusted.

Table B-13 Disability Type by Age Group

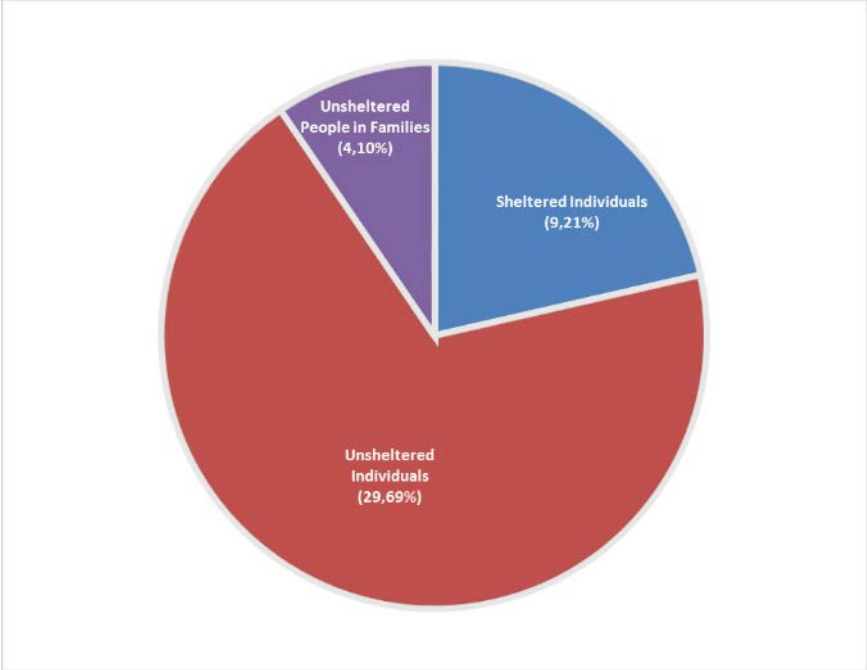
	Hearing Disability	Vision Disability	Cognitive Disability	Ambulatory Disability	Self-Care Disability	Independent Living Disability
Total Population^	4.4%	2.1%	6.3%	8.0%	3.1%	6.2%
Under 18*	0.9%	0.7%	5.1%	0.7%	0.9%	0.0%
18 to 64*	2.4%	2.0%	5.8%	6.3%	2.2%	4.2%
65 and over*	17.0%	4.7%	9.2%	22.1%	8.7%	13.7%

Source: U.S. Census Bureau, 2011-2015 American Community Survey, Table S1810.
^ Non-institutionalized civilian population, * Percent of age group

In 2015, Oregon Housing and Community Services (OHCS) conducted a point-in-time homeless count to identify the number of homeless, their age and their family type. The OHCS study found that 42 individuals and persons in families in Polk County identify as homeless; 9 were sheltered, 33 were unsheltered (29 individuals and 4 persons in families).

The homeless have little resources to rely on, especially during an emergency. It will likely be the responsibility of the county and local non-profit entities to provide services such as shelter, food and medical assistance. Therefore, it is critical to foster collaborative relationships with agencies that will provide additional relief such as the American Red Cross and homeless shelters. It will also be important to identify how to communicate with these populations, since traditional means of communication may not be appropriate or available.

Figure B-2 Polk County PIT Homeless Count (2015)



Source: Oregon Housing and Community Services, 2015 Point-in-Time Homeless Count

Synthesis

For planning purposes, it is essential Polk County consider both immediate and long-term socio-demographic implications of hazard resilience. Immediate concerns include the growing elderly population and language barriers associated with a culturally diverse community. Even though the vast majority of the population is reported as proficient in English, there is still a segment of the population not proficient in English. These populations would serve to benefit from mitigation outreach, with special attention to cultural, visual and technology sensitive materials. The current status of other social/-demographic capacity indicators such as graduation rate, poverty level, and median household income can have long-term impacts on the economy and stability of the community ultimately affecting future resilience.

In mitigation and preparedness planning it is critical for the safety of all residents that messaging and actions are culturally sensitive to all racial and ethnic groups. This may range from providing multi-lingual services to adopting entirely different strategies for outreach or specialized mitigation actions to address the unique risk faced by various racial and ethnic groups. For example, if multigenerational family units are more typical in some cultures, evacuation may be more take longer to accommodate the elderly and children living at home, or could even be impeded if there is only one family car. Additionally, varying cultural perceptions of the trustworthiness of government may need to be overcome so that suggestions to evacuate or shelter in place are taken seriously by residents.

Economic Capacity

Economic capacity refers to the financial resources present and revenue generated in the community to achieve a higher quality of life. Income equality, housing affordability, economic diversification, employment and industry are measures of economic capacity. However, economic resilience to natural disasters is far more complex than merely restoring employment or income in the local community. Building a resilient economy requires an understanding of how the component parts of employment sectors, workforce, resources and infrastructure are interconnected in the existing economic picture. Once any inherent strengths or systematic vulnerabilities become apparent, both the public and private sectors can take action to increase the resilience of the local economy.

Regional Affordability

The evaluation of regional affordability supplements the identification of Social/demographic capacity indicators, i.e. median income, and is a critical analysis tool to understanding the economic status of a community. This information can capture the likelihood of individuals' ability to prepare for hazards, through retrofitting homes or purchasing insurance. If the community reflects high-income inequality or housing cost burden, the potential for home-owners and renters to implement mitigation can be drastically reduced. Therefore, regional affordability is a mechanism for generalizing the abilities of community residents to get back on their feet without Federal, State or local assistance.

Income Equality

Income equality is a measure of the distribution of economic resources, as measured by income, across a population. It is a statistic defining the degree to which all persons have a similar income. The table below illustrates the county and cities level of income inequality. The Gini index is a measure of income inequality. The index varies from zero to one. A value of one indicates perfect inequality (only one household has any income). A value of zero indicates perfect equality (all households have the same income).[13]

The cities within the county have similar income equality scores; Dallas and Independence have slightly greater income equality than do Falls City and Monmouth. Independence and Monmouth have the highest level of income inequality of the incorporated cities (0.46). Based on social science research, the region's cohesive response to a hazard event may be affected by the distribution of wealth in communities that have less income equality[14].

[13]University of California Berkeley. Building Resilient Regions, Resilience Capacity Index. http://brr.berkeley.edu/rci/.

[14] Susan Cutter, Christopher G. Burton, and Christopher T. Emrich. 2010. "Disaster Resilience Indicators for Benchmarking Baseline Conditions," Journal of Homeland Security and Emergency Management 7, no.1: 1-22

Table B-14 Regional Income Equality

Jurisdiction	Income Inequality Coefficient
Polk County	0.42
Dallas	0.42
Falls City	0.46
Independence	0.40
Monmouth	0.46

Source: Social Explorer, Table 157, U.S. Census Bureau, 2011-2015 American Community Survey Estimates

Housing Affordability

Housing affordability is a measure of economic security gauged by the percentage of an area's households paying less than 30% of their income on housing.[15] Households spending more than 30% are considered housing cost burdened. The table below displays the percentage of homeowners and renters reflecting housing cost burden across the region.

Overall roughly 30% of homeowners with a mortgage have a housing cost burden, compared to over 50% of renters. Amongst renters, the cities of Falls City, Independence, and Monmouth have more than 60% of renters with a housing cost burden. In general, the population that spends more of their income on housing has proportionally fewer resources and less flexibility for alternative investments in times of crisis.[16] This disparity imposes challenges for a community recovering from a disaster as housing costs may exceed the ability of local residents to repair or move to a new location. These populations may live paycheck to paycheck and are extremely dependent on their employer, in the event their employer is also impacted it will further the detriment experienced by these individuals and families.

Table B-15 Households Spending > 30% of Income on Housing

Jurisdiction	Owners		Renters
	With Mortgage	Without Mortgage	
Polk County	31.4%	5.3%	53.1%
Dallas	27.2%	7.1%	51.6%
Falls City	43.3%	20.3%	63.9%
Independence	34.3%	1.5%	65.0%
Monmouth	41.4%	2.8%	69.5%

Source: Social Explorer, Tables 103 and 109, U.S. Census Bureau, 2011-2015 American Community Survey Estimates

[15] University of California Berkeley. Building Resilient Regions, Resilience Capacity Index. http://brr.berkeley.edu/rci/.

[16] Ibid.

Economic Diversity

Economic diversity is a general indicator of an area's fitness for weathering difficult financial times. Business activity in the Willamette Valley region is fairly homogeneous and consists mostly of small businesses.

Economic diversity is a general indicator of an area's fitness for weathering difficult financial times. One method for measuring economic diversity is through use of the Herfindahl Index, a formula that compares the composition of county and regional economies with those of states or the nation as a whole. Using the Herfindahl Index, a diversity ranking of 1 indicates the county with the most diverse economic activity compared to the state as a whole, while a ranking of 36 corresponds with the least diverse county economy. The table below describes the Herfindahl Index Scores for counties in the region.

Table B-16 shows that Polk County has an economic diversity rank of 9 as of 2013, this is on a scale between all 36 counties in the state where 1 is the most diverse economic county in Oregon and 36 is the least diverse. The county's ranking has increased since 2008.

Table B-16 Regional Herfindahl Index Scores

	2008			2013		
County	Employment	Number of Industries	State Rank	Employment	Number of Industries	State Rank
Polk	12,837	178	18	12,179	167	9
Benton	26,433	199	23	25,247	201	21
Linn	36,360	225	5	33,934	222	4
Marion	105,758	252	3	101,571	245	3
Yamhill	27,797	209	9	27,860	209	6

Source: Oregon Employment Department

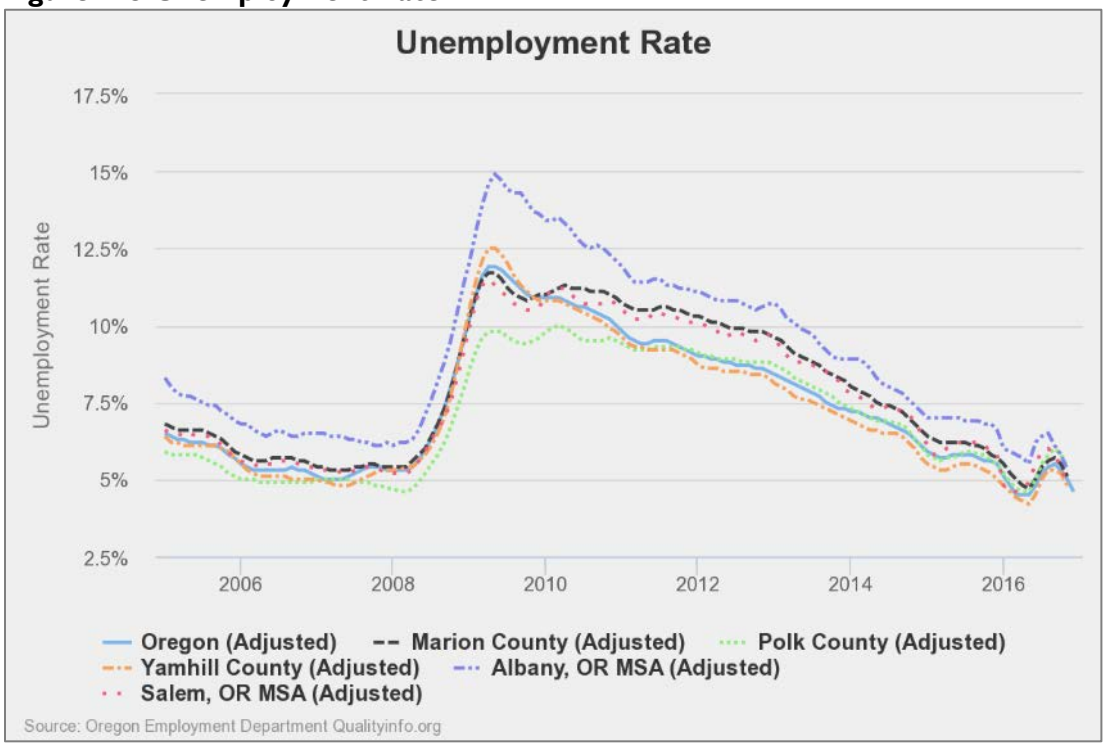
While illustrative, economic diversity is not a guarantor of economic vitality or resilience. Polk County, as of 2017, is not listed as an economically distressed community as prescribed by Oregon Law. The economic distress measure is based on indicators of decreasing new jobs, average wages and income, and is associated with an increase of unemployment.[17]

[17] Business Oregon – Oregon Economic Data "Distressed Communities List", http://www.oregon4biz.com/Publications/Distressed-List/

Employment and Wages

According to the Oregon Employment Department, unemployment has declined since 2009 (9.8%) and remains at a rate similar to the State of Oregon and other counties in the region (5.4%).

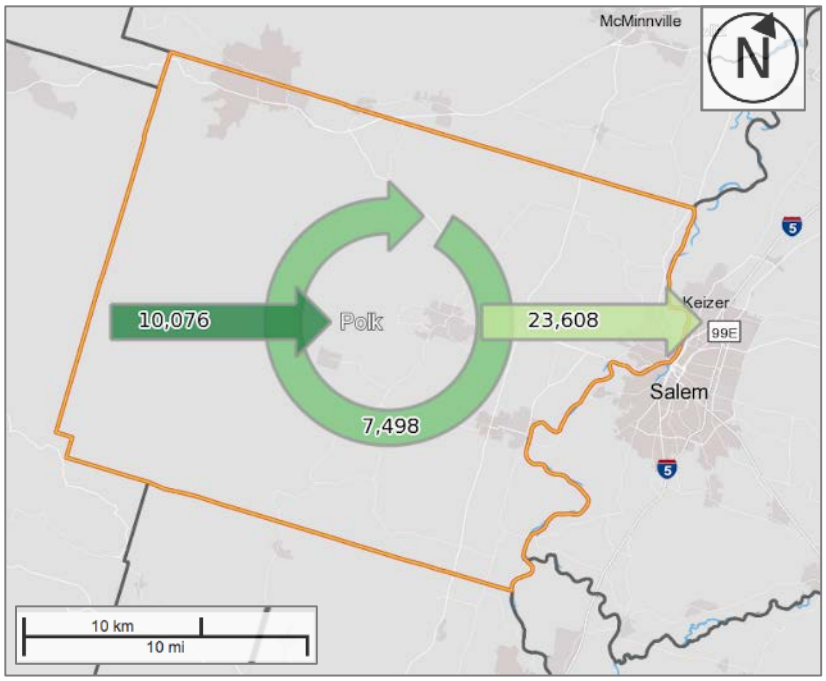
Figure B-3 Unemployment Rate



Source: Oregon Employment Department, "Local Area Employment Statistics" 2005-2016, Qualityinfo.org .

Polk County employers draw in more than 57% (10,076) of their workers from outside the county. The Polk County economy is a cornerstone of regional economic vitality. Figure B-4 shows the county's laborshed; the map shows that about 18% of workers live and work in the county (7,498), 25% of workers come from outside the county (10,076), and about 57% of residents work outside of the county (23,608).

Figure B-4 Polk County Laborshed



Source: U.S. Bureau of the Census, On The Map.

Mitigation activities are needed at the business level to ensure the health and safety of workers and limit damage to industrial infrastructure. Employees are highly mobile, commuting from all over the surrounding area to industrial and business centers. As daily transit rises, there is an increased risk that a natural hazard event will disrupt the travel plans of residents across the region and seriously hinder the ability of the economy to meet the needs of Polk County residents and businesses.

Industry

Key industries are those that represent major employers and are significant revenue generators. Different industries face distinct vulnerabilities to natural hazards, as illustrated by the industry specific discussions below. Identifying key industries in the region enables communities to target mitigation activities towards those industries' specific sensitivities. It is important to recognize that the impact that a natural hazard event has on one industry can reverberate throughout the regional economy.

This is of specific concern when the businesses belong to the basic sector industry. Basic sector industries are those that are dependent on sales outside of the local community; they bring money into a local community via employment. The farm and ranch, information, and wholesale trade industries are all examples of basic industries. Non-basic sector industries are those that are dependent on local sales for their business, such as retail trade, construction, and health services.

Employment by Industry

Economic resilience to natural disasters is particularly important for the major employment industries in the region. If these industries are negatively impacted by a natural hazard, such that employment is affected, the impact will be felt throughout the regional economy. Thus, understanding and addressing the sensitivities of these industries is a strategic way to increase the resiliency of the entire regional economy.

The table below identifies Employment by industry. The top five industry sectors in Polk County with the most employees, as of 2015, are Local Government (3,536), Education and Health Services (2,659), Manufacturing (2,232), Trade, Transportation and Utilities (2,141), and Natural Resources and Mining (1,781). While Polk County has some basic industries, such as Manufacturing four out of the five largest industrial sectors are of the non-basic nature and thus they rely on local sales and services. Trending towards basic industries can lead to higher community resilience.

Table B-17 Total Employment by Industry 2015, Expected Growth 2024

	2015					
Employment Sector	Firms	Employees	Percent Workforce	Average Wage	Percent Change in Employment (2009-2015)	Employment Forecast* (2014-2024)
Total Payroll Employment	1,807	18,985	100%	$ 33,896	14.9%	9.6%
Total Private	1,719	13,769	72.5%	$ 31,121	15.4%	11.5%
Natural Resources and Mining	127	1,781	9.4%	$ 31,983	15.5%	10.7%
Construction	186	840	4.4%	$ 45,704	-14.3%	**18.6%**
Manufacturing	84	2,232	11.8%	$ 38,003	18.3%	8.5%
Trade, Transportation & Utilities	232	2,141	11.3%	$ 32,203	0.9%	8.4%
Information	18	54	0.3%	$ 42,748	**20.0%**	0%
Financial Activities	143	435	2.3%	$ 37,661	4.4%	5.0%
Professional and Business Services	222	1,127	5.9%	$ 32,219	**18.7%**	**16.7%**
Education and Health Services	219	2,659	14.0%	$ 31,421	**21.0%**	**15.5%**
Leisure and Hospitality	141	1,584	8.3%	$ 14,511	**27.0%**	9%
Other Services	343	909	4.8%	$ 19,579	**53.8%**	**14.6%**
Private Non-Classified	0	-	-	-	-	-
Government	88	5,216	27.5%	$ 41,221	6.0%	2.9%
Federal	12	70	0.4%	$ 52,460	-29.4%	-4.8%
State	11	1,609	8.5%	$ 39,678	0.0%	4.2%
Local	64	3,536	18.6%	$ 41,712	0.0%	2.3%

Source: Oregon Employment Department, "2009 and 2015 Covered Employment and Wages Summary Reports" and "Regional Employment Projections by Industry & Occupation 2014-2024". http://www.qualityinfo.org.
*Based on 2024 projections for Linn, Marion, Polk, and Yamhill counties – Department of Administrative Services

High Revenue Sectors

In 2012, the three sectors with the highest revenue were Manufacturing, Retail Trade, and Health Care & Social Assistance. The table below shows the revenue generated by each economic sector (Note: not all sectors are reported).

Polk County relies on both basic and non-basic sector industries and it is important to consider the effects each may have on the economy following a disaster. Basic sector businesses have a multiplier effect on a local economy that can spur the creation of new jobs, some of which may be non-basic. The presence of basic sector jobs can help speed the

local recovery; however, if basic sector production is hampered by a natural hazard event, the multiplier effect could be experienced in reverse. In this case, a decrease in basic sector purchasing power results in lower profits and potential job losses for the non-basic businesses that are dependent on them.

Table B-18 Revenue of Top Sectors in Polk County (Employer)

Sector Meaning (NAICS code)	Sector Revenue ($1,000)
Manufacturing	$ 424,650
Retail trade	$ 360,670
Health care and social assistance	$ 168,554
Transportation and warehousing	$ 46,192
Professional, scientific, and technical services	$ 36,222
Administrative and support and waste management and remediation services	$ 26,321
Other services (except public administration)	$ 25,738
Real estate and rental and leasing	$ 19,399
Arts, entertainment, and recreation	$ 4,599
Educational services	$ 1,701
Utilities	Q
Information	N
Finance and insurance	N
Accommodation and food services	D

Source: U.S. Census Bureau, 2012 Economic Census, Table EC1200A1.
D = Withheld to avoid disclosing data for individual companies; data are included in higher level totals
N = Not available or not comparable
Q= Revenue not collected at this level of detail for multi-establishment firms

The *Manufacturing* sector was the largest revenue generator, generating $424.6 million. It is highly dependent upon the transportation network in order to access supplies and send finished products to outside markets. As a base industry, manufacturers are not dependent on local markets for sales, which contribute to the economic resilience of this sector.

The *Retail Trade* sector generated $360.7 million, making it the second largest earning sector in Polk County. The *Retail Trade* sector typically relies on local residents and tourists and their discretionary spending ability. Residents' discretionary spending diminishes after a natural disaster when they must pay to repair their homes and properties. In this situation, residents will likely concentrate their spending on essential items that would benefit some types of retail (e.g., grocery) but hurt others (e.g., gift shops). The potential income from tourists also diminishes after a natural disaster as people are deterred from visiting the impacted area. Retail trade is also largely dependent on wholesale trade and the transportation network for the delivery of good for sale. Disruption of the transportation system could have severe consequences for retail businesses. In summary, depending on the type and scale, a disaster could affect specific segments of retail trade, or all segments.

Health Care & Social Assistance generated about $168.6 million. Health Care & Social Assistance has a broad client base, with families and non-families as the typical clientele. Health and social services will likely see an increase in demand after a natural disaster, as affected populations seek care and assistance. Functional operation of health and social

services may be negatively impacted by hazards and access to services by residents may be limited.

In the event that any of these primary sectors are impacted by a disaster, Polk County may experience a significant disruption of economic productivity.

Future Employment in Industry

Between 2009 and 2015, the sectors that experienced the largest percent growth were Other Services (53.8%), Leisure and Hospitality (27.0%), Education and Health Services (21.0%), Information (20.0%), and Professional and Business Services (18.7%). Some of these sectors often require more training and education, while others require less education and have lower wages. Education and Health Services (2,659 employees) and Local Government (3,536) are among the highest employers, Other Services (53.8%) and Leisure and Hospitality (27%) are the fastest growing, and Federal Government ($52,460) and Construction ($45,704) have the highest average wages.

Sectors that are anticipated to be major employers in the future also warrant special attention in the hazard mitigation planning process. As shown in Table B-17, between 2014 and 2024, the largest employment growth in the region is anticipated within Construction (18.6%), Professional and Business Services (16.7%), Education and Health Services (15.5%), and Other Services (14.6%); Federal Government is expected to continue to decline by almost 5%.[18]

Synthesis

The current and anticipated financial conditions of a community are strong determinants of community resilience, as a strong and diverse economic base increases the ability of individuals, families and the community to absorb disaster impacts for a quick recovery. Because Local Government, Education and Health Services, and Manufacturing are key to post-disaster recovery efforts, the region is bolstered by its major employment sectors. The county's economy is expected to grow by 2024, with much of the growth within the industries of Construction, Professional and Business Services, Education and Health Services, and Other Services. It is important to consider what might happen to the county economy if the largest revenue generators and employers are impacted by a disaster. Areas with less income equality, particularly in the smaller cities, higher housing costs, and overall low economic diversity are factors that may contribute to slower recovery from a disaster.

[18] Oregon Employment Department, "Employment Projections by Industry and Occupations: 2014-2024 Oregon and Regional Summary", https://www.qualityinfo.org/documents/10182/92203/Mid-Valley+Industry+Employment+Projections+2014-2024?version=1.5, January 2017.

Built Environment Capacity

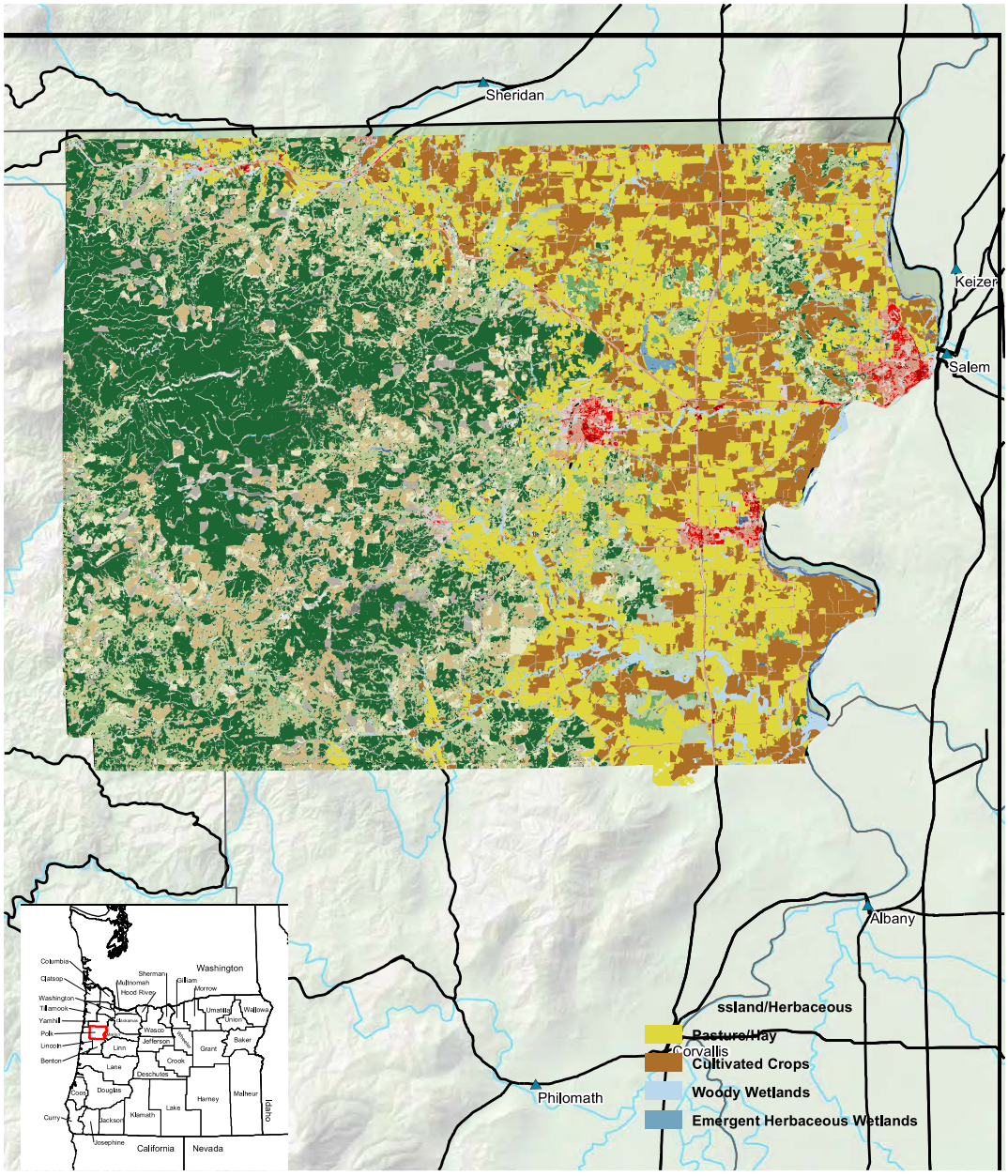
Built Environment capacity refers to the built environment and infrastructure that supports the community. The various forms, quantity, and quality of built capital mentioned above contribute significantly to community resilience. Physical infrastructures, including utility and transportation lifelines, are critical during a disaster and are essential for proper functioning and response. The lack or poor condition of infrastructure can negatively affect a community's ability to cope, respond and recover from a natural disaster. Following a disaster, communities may experience isolation from surrounding cities and counties due to infrastructure failure. These conditions force communities to rely on local and immediately available resources.

Land Use and Development Patterns

The Polk County Comprehensive Plan states that the vast majority of the County is devoted to private timber production with minimal federal, state, and county managed forested lands (see Map B-2). A very limited percentage of land is designated as High Density Use, approximately four percent. The county feels limited high density increases will occur around the four incorporated jurisdictions of Dallas, Falls City, Independence, and Monmouth. However, there is significant pressure to develop low density residential development. The County has designated two percent of its land area for such use.

One significant way in which Polk County residents can increase or decrease their vulnerability to natural hazards is through development patterns. The way in which land is used – is it a parking lot or maintained as an open space – will determine how closely the man-made systems of transportation, economy, etc., interact with the natural environment. All patterns of development, density as well as sprawl, bring separate sets of challenges for hazard mitigation.

Map B-2 Land Cover



Source: Polk County NHMP (2009).

Regulatory Context

Oregon land use laws require land outside Urban Growth Boundaries (UGBs) to be protected for farm, forest, and aggregate resource values. For the most part, this law limits the amount of development in the rural areas. However, the land use designation can change from resource protection in one of two ways:

- The requested change could qualify as an exception to Statewide Planning Goals, in which case the city must demonstrate to the State that the change meets requirements for an exception. These lands, known as exception lands, are predominantly designated for residential use.
- Resource land can also be converted to non-resource use when it can be demonstrated that the land is no longer suitable for farm or forest production.

Local and state policies currently direct growth away from rural lands into UGBs, and, to a lesser extent, into rural communities. If development follows historical development trends, urban areas will expand their UGBs, rural unincorporated communities will continue to grow, and overall rural residential density will increase slightly with the bulk of rural lands kept in farm and forest use. The existing pattern of development in the rural areas, that of radiating out from the urban areas along rivers and streams is likely to continue. Most of the "easy to develop" land is already developed, in general leaving more constrained land such as land in the floodplains or on steep slopes to be developed in the future, perhaps increasing the rate at which development occurs in natural hazard areas.

Since 1973, Oregon has maintained a strong statewide program for land use planning. The foundation of that program is a set of 19 statewide planning goals that express the state's policies on land use and on related topics, such as citizen involvement, land use planning, and natural resources.

Most of the goals are accompanied by "guidelines," which are suggestions about how a goal may be applied. Oregon's statewide goals are achieved through local comprehensive planning. State law requires each city and city to adopt a comprehensive plan and the zoning and land-division ordinances needed to put the plan into effect. The local comprehensive plans must be consistent with the statewide planning goals. Plans are reviewed for such consistency by the state's Land Conservation and Development Commission (LCDC). When LCDC officially approves a local government's plan, the plan is said to be "acknowledged." It then becomes the controlling document for land use in the area covered by that plan.

Goal 7

Goal 7: Areas Subject to Natural Disasters and Hazards has the overriding purpose to "protect people and property from natural hazards". Goal 7 requires local governments to adopt comprehensive plans (inventories, policies and implementing measures) to reduce risk to people and property from natural hazards. Natural hazards include floods, landslides, earthquakes, tsunamis, coastal erosion, and wildfires.

To comply with Goal 7, local governments are required to respond to new hazard inventory information from federal or state agencies. The local government must evaluate the hazard risk and assess the:

a) frequency, severity, and location of the hazard;
b) effects of the hazard on existing and future development;
c) potential for development in the hazard area to increase the frequency and severity of the hazard; and
d) types and intensities of land uses to be allowed in the hazard area.

Local governments must adopt or amend comprehensive plan policies and implementing measures to avoid development in hazard areas where the risk cannot be mitigated. In addition, the siting of essential facilities, major structures, hazardous facilities and special occupancy structures should be prohibited in hazard areas where the risk to public safety cannot be mitigated. The state recognizes compliance with Goal 7 for coastal and riverine flood hazards by adopting and implementing local floodplain regulations that meet the minimum National Flood Insurance Program (NFIP) requirements.

In adopting plan policies and implementing measures for protection from natural hazards local governments should consider:

a) the benefits of maintaining natural hazard areas as open space, recreation, and other low density uses;
b) the beneficial effects that natural hazards can have on natural resources and the environment; and
c) the effects of development and mitigation measures in identified hazard areas on the management of natural resources.

Local governments should coordinate their land use plans and decisions with emergency preparedness, response, recovery and mitigation programs. Given the numerous waterways, agricultural, and forest lands, special attention should be given to problems associated with river bank erosion and potential for wild land/urban interface fires.

Goal 7 guides local governments to give special attention to emergency access when considering development in identified hazard areas, including:

a) Consider programs to manage stormwater runoff as a means to address flood and landslide hazards,
b) Consider non-regulatory approaches to help implement the goal,
c) When reviewing development requests in high hazard areas, require site specific reports, appropriate for the level and type of hazards. Site specific reports should evaluate the risk to the site, as well as the risk the proposed development may pose to other properties.
d) Consider measures exceeding the National Flood Insurance Program.

Housing

In addition to location, the characteristics of the housing stock affect the level of risk posed by natural hazards. The table below identifies the types of housing most common throughout the county. Of particular interest are mobile homes, which account for about 7.4% of the housing in Polk County. Mobile homes are particularly vulnerable to certain natural hazards, such as windstorms, and special attention should be given to securing the structures, because they are more prone to wind damage than wood-frame construction. In other natural hazard events, such as earthquakes and floods, moveable structures like

mobile homes are more likely to shift on their foundations and create hazardous conditions for occupants.

Table B-19 Housing Profile

	Housing Units	Single Family		Multi-Family		Mobile Homes*	
		Estimate	Percent	Estimate	Percent	Estimate	Percent
Polk County	30,651	21,971	71.7%	6,425	21.0%	2,255	7.4%
Dallas	5,907	4,014	68.0%	1,528	25.9%	365	6.2%
Falls City	393	284	72.3%	2	0.5%	107	27.2%
Independence	3,200	1,912	59.8%	1,091	34.1%	197	6.2%
Monmouth	3,687	2,279	61.8%	1,249	33.9%	159	4.3%

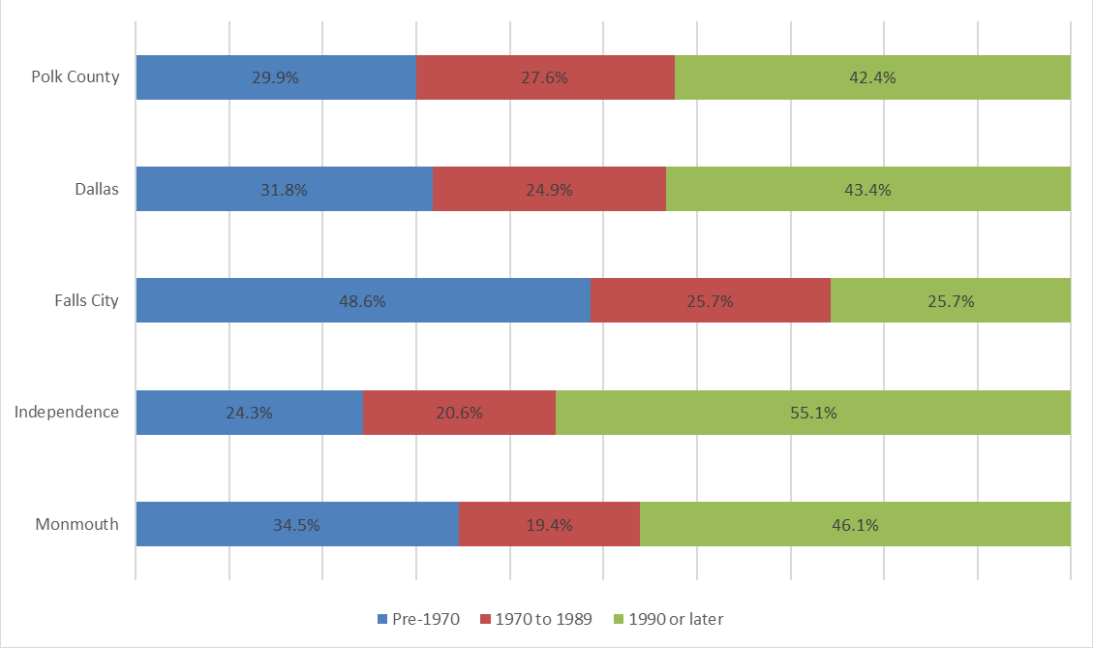
Source: Social Explorer, Table 97, U.S. Census Bureau, 2011-2015 American Community Survey
* Also includes boats, RVs, vans, etc. that are used as a residence.

Aside from location and type of housing, the year structures were built has implications. Seismic building standards were codified in Oregon building code starting in 1974; more rigorous building code standards were passed in 1993 that accounted for the Cascadia earthquake fault.[19] Therefore, homes built before 1993 are more vulnerable to seismic events. Also in the 1970's, FEMA began assisting communities with floodplain mapping as a response to administer the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973. Upon receipt of floodplain maps, communities started to develop floodplain management ordinances to protect people and property from flood loss and damage.

As Figure B-5 shows, regionally, 29.9% of the county housing stock was built prior to 1970, before the implementation of floodplain management ordinances; however, Falls City has about one-half of its housing units built prior to 1970. Countywide, 57.5% of the housing stock was built before 1990 and the codification of seismic building standards.

[19] State of Oregon Building Codes Division. *Earthquake Design History: A summary of Requirements in the State of Oregon*, February 7, 2012. http://www.oregon.gov/OMD/OEM/osspac/docs/history_seismic_codes_or.pdf

Figure B-5 Year Structure Built



Source: U.S. Census Bureau, 2011-2015 American Community Survey Estimates, Table DP04

The National Flood Insurance Program's (NFIP's) Flood Insurance Rate Maps (FIRMs) delineate flood-prone areas. They are used to assess flood insurance premiums and to regulate construction so that in the event of a flood, damage minimized. The initial FIRMs for the county were created in 1978 (1981 for Falls City, 1988 for Dallas, Independence, and Monmouth), while the current FIRMs effective date for Polk County and cities is December 19, 2006. For more information about the flood hazard, NFIP, and FIRMs, please refer to Flood Hazard section of the Risk Assessment.

Infrastructure Profile

Infrastructure and critical facilities are vital to the continued delivery of key governmental and private services as well as recovery efforts. The loss of these services may cause serious secondary impact as well as significantly hamper the public's ability to recover from a disaster event. Homeland Security Presidential Directive 7 calls out seventeen sectors as Critical Infrastructure and Key Resources that are "essential to the nation's security, public health and safety, economic vitality, and way of life." This section identifies critical infrastructure and key resources in Polk County. The sectors include:

Agriculture and food: This is a primarily private sector industry but includes both imported / exported food as well and what is grown in the county.

Banking and finance: For Polk County, this sector would include not only accounts payable /receivable and payroll, but social services provided to residents through community welfare programs.

Chemical: Manufacturing and agricultural processes can often require the use of chemicals and substances that would harm residents if air or water resources were contaminated.

Communications and Information technology: Phone lines, cell towers, broadcast internet, and radio and television signals are mediums for interpersonal connection, economic vitality, and emergency communications in the county. Additionally, and of importance to the region as much as to the county, weather stations such as the Valsetz site in the Coast Range of Polk County, can be quickly cut off by fire or earthquake. In the case of a crisis, the ability to transmit information between responders and to residents can mean the difference between life and death.

National Guard: The Oregon Military Department (Oregon National Guard) maintains the Polk County Readiness Center (12835 Westview Drive, Dallas - unincorporated Polk County).

Emergency services: 911 call centers and police and fire stations provide first responders for most hazard events and often become the base of response operations during prolonged hazard events. Population distribution and service areas as well as the availability and duplication of resources at each station can play a role in determining how, where, and when response and recovery are effective.

Table B-20 Critical Facilities: Emergency Response

Facility Name	Address/ City
Polk County	
Rickreall Fire Station	275 N Pacific Highway W, Rickreall
Dallas	
Dallas Police Department	187 SE Court Street, Dallas
Dallas Fire Department	910 SE Shelton, Dallas
Dallas Ambulance Service	SE Washington, Dallas
Polk County Sheriff's Office Headquarters	850 Main St, Dallas
Polk County Jail	884 SE Jefferson St, Dallas
Southwest Polk Rural Fire District	915 SE Shelton St, Dallas
Falls City	
Falls City Fire and Police Department	320 N Main Street, Falls City
Independence	
Independence Police Department	555 S Main St., Independence
Polk County Fire District #1 (Administration)	1800 Monmouth St, Independence
Polk County Fire District #1 (Station 40)	5979 Main St, Independence
Monmouth	
Monmouth Police Department	238 W Jackson Street, Monmouth
Oregon State Police	550 Monmouth Ave N, Monmouth
Other	
West Valley Fire District Station 8	825 NE Main St, Willamina

Note: Table is organized by location not by owner/ operator (except as noted). See Jurisdictional Addenda for additional detail.

Energy: In Polk County, electrical and gas utilities are provided by both private companies and some smaller cooperatives. Organizing mitigation across these diverse organizational structures and philosophies will ensure that services are provided equitably, even if a hazard incident stresses the supply or demand. Critical infrastructure includes power substations, gas-lines, and both underground and above ground transmission lines.

Governmental facilities: Every day, community leaders and residents rely on the buildings that house essential governmental functions: City Halls, Court Houses, public works buildings and more. Protecting and reinforcing these facilities will facilitate the return to "business as usual" after a hazard event. The following government buildings are considered critical facilities:

Table B-21 Critical Facilities: Government

Facility Name	Address/ City
Polk County	
Polk County Fairgrounds	520 S Pacific Highway, Rickreal
Polk County Human Services (W. Salem)	1520 Plaza Street NW, Salem
Dallas	
Dallas City Hall/ Civic Center/ Police Department	187 SE Court St, Dallas
Polk County Courthouse/Sheriff's Office	850 Main St, Dallas
Polk County Public Works	820 SW Ash St, Dallas
Polk County Human Services/ Extension Services	182 SW Academy St, Dallas
Agricultural, Polk Soil, Farm Home Administration/ USDA	289 E Ellendale, Dallas
Oregon Volunteer Services	177 SW Oak, Dallas
Adult and Family Services	77 SW Clay, Dallas
Falls City	
City Hall	299 Mill Street, Falls City
Independence	
Independence City Hall/ Police Station	240 Monmouth St, Independence
Public Works	160 G Street, Independence
Monmouth	
Monmouth City Hall	151 W Main Street , Monmouth
Monmouth Public Works / Public Utilities	401 N Hogan Road, Monmouth
Polk County Human Services (Monmouth)	1310 Main Street East, Monmouth

Note: Table is organized by location not by owner/ operator (except as noted). See Jurisdictional Addenda for additional detail.

Schools: Schools are occupied by vulnerable younger populations and may also be used as emergency shelters during hazard events. The following school districts are within the county (for a list of locations see the Earthquake profile within Section 2, *Risk Assessment)*.[20]:

- Dallas School District 2 (6 schools)
- Falls City School District 57 (2 schools)
- Central School District 13J (5 schools)
- Willamina School District 30J (2 schools)

[20] "School District Maps." *Polk County Oregon Official Website*. Polk County, n.d. Web. 10 Aug. 2016.

- Perrydale School District 21 (3 schools)
- Charter Schools

Healthcare and public health: Hospitals, clinics, and shelters often play a critical role in the immediate aftermath of a hazard incident in saving lives and keeping residents safe. In addition to satellite clinics, doctors' offices, and urgent care facilities. The following healthcare, care facilities are considered critical:

Table B-22 Critical Facilities: Healthcare/ Care Facilities

Facility Name	Address/ City
Polk County	
None noted	
Dallas	
Hospital: Salem Health West Valley	525 SE Washington Street, Dallas
Oregon Adult and Family Services	770 SW Clay Street, Dallas
Dallas Retirement Village	340 NW Brentwood Ave, Dallas
Falls City	
See city addendum.	
Independence	
See city addendum.	
Monmouth	
See city addendum.	

Note: Table is organized by location not by owner/ operator (except as noted). See Jurisdictional Addenda for additional detail.

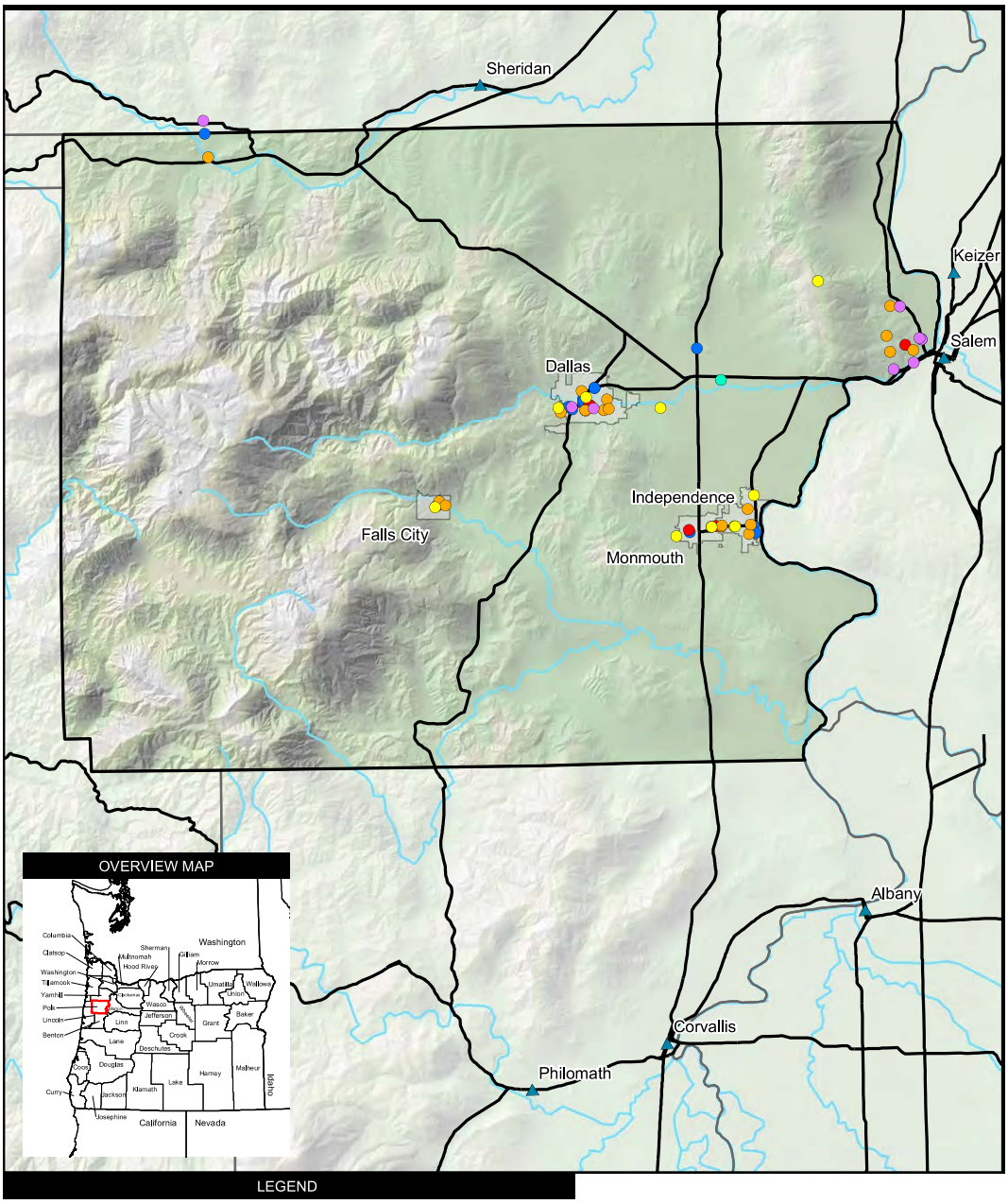
Transportation systems: Urban Polk County meets its current transportation needs through a mixture of municipal road systems, county roads, and state and federal highways. Major highways in the county include Oregon Route 99W, which runs from north to south, linking the cities of McMinnville and Corvallis, and Oregon Route 22, running east to west and connecting Salem to the coast. Oregon Route 223 branches west from Rickreall and connects Dallas to Wren along Interstate 20 to the south. Oregon Route 194 spans a 7.5-mile connection from east to west between Monmouth and Oregon Route 223.

Cycling / pedestrian paths are used both for commuting and recreation and their bridges and overpasses connect communities in crucial ways. Through Salem-Keizer Transit, the CARTS program (Chemeketa Area Regional Transportation System) connects rural Marion and Polk counties across five bus lines. The CARTS 40 bus line connects to the cities of Dallas, Independence and Monmouth while CARTS 50 connects to Rickreall and Dallas. Falls City is not directly serviced by any routes within the Salem-Keizer Transit system[21].

In Polk County, rail lines and bridges are more vulnerable to impacts from flood and earthquake as even minor shifts in their alignment can render them unusable and stop the flow of civilian and emergency service traffic on either side of the affected area.

[21] "CARTS: Connecting Rural Marion and Polk Counties." *CARTS*. Salem-Keizer Transit, n.d. Web. 10 Aug. 2016.

Map B-3 Critical Facilities



Source: Polk County NHMP (2009).

Utilities/ Water: In Polk County, water resources are abundant yet fragile and can even be dangerous. Water resources are susceptible to pollution from runoff or toxic spills. Low rain years can increase the risk of drought in the summer while intense periods of rain can bring

floods or landslides. Rivers and their tributaries can only be managed so much by dams and culverts. Responsible development in the floodplain and throughout the county that maintains and supports and natural drainage system can help protect water resources.

A major valuable asset within the county is the series of water treatment plants. Many of these facilities rely on power to pump and purify water or have storage tanks that sit vulnerable to earthquakes without retrofit or on unstable soil. Additionally, the vulnerability of septic systems may be heightened in more rural areas due to power failures, severe weather, and earthquake.

Physical infrastructure such as dams, levees, roads, bridges, railways and airports support Polk County communities and economies. Due to the fundamental role that physical infrastructure plays both in pre- and post-disaster, they deserve special attention in the context of creating resilient communities.

Utility systems such as potable water, wastewater, natural gas, telecommunications, and electric power are all networked systems. That is, they consist of nodes and links. Nodes are centers where something happens - such as a pumping plant, a treatment plant, a substation, a switching office and the like. Links are the connections (pipes or lines) between nodes. The following utilities are considered critical:

Table B-23 Critical Facilities/ Infrastructure: Utilities

Facility Name	Address/ City
Polk County	
Polk County Communications Sites/ Towers	-
Dallas	
Pacific Power and Light	583 SE Jefferson, Dallas
Dallas Sewer Lagoon	Bowersville Road, Dallas
Dallas Water Reservoir	Reservoir Road, Dallas
Falls City	
See city addendum	
Independence	
Independence Water Tower	1180 Monmouth Street, Independence
Pacific Power & Light Sub Station	1150 Monmouth Street, Independence
Independence Water Wells	off Hannah Road, Independence
Sewage Lagoon and Pump Station	Riverside Park, Independence
Monmouth	
Monmouth Water Tower	Cupids Knoll, Monmouth
Monmouth Power (Bonneville sub.)	Monmouth
Monmouth Public Works/Public Utilities	401 N Hogan Rd, Monmouth
Monmouth Water Wells	Across Independence Bridge (Marion Co.)

Note: Table is organized by location not by owner/ operator (except as noted). See Jurisdictional Addenda for additional detail.

Dams: These critical infrastructure pieces not only protect water resources that are used for drinking, agriculture, and recreation, but they protect downstream development from inundation. Dams may also be multifunction, serving two or more of these purposes.

The National Inventory of Dams, NID, which is maintained by the United States Army Corps of Engineers, is a database of approximately 76,000 dams in the United States. The NID does not include all dams in the United States. Rather, the NID includes dams that are deemed to have a high or significant hazard potential and dams deemed to pose a low hazard if they meet inclusion criteria based on dam height and storage volume. Low hazard potential dams are included only if they meet either of the following selection criteria:

- exceeds 25 feet in height and 15 acre-feet of storage, or
- exceeds 6 feet in height and 50-acre feet of storage.

There are many thousands of dams too small to meet the NID selection criteria. However, these small dams are generally too small to have significant impacts if they fail and thus are generally not considered for purposes of risk assessment or mitigation planning.

This NID potential hazard classification is solely a measure of the probable impacts if a dam fails. Thus, a dam classified as High Potential Hazard does not mean that the dam is unsafe or likely to fail. The level of risk (probability of failure) of a given dam is not even considered in this classification scheme. Rather, the High Potential Hazard classification simply means that there are people at risk downstream from the dam in the inundation area, if the dam were to fail.

Dams assigned the low hazard potential classification are those where failure or mis-operation results in no probable loss of human life and low economic and/or environmental losses. Losses are principally limited to the dam owner's property.

Dams assigned to the significant hazard potential classification are those where failure or mis-operation results in no probable loss of human life but can cause economic loss, environmental damage, or disruption of lifeline facilities. Significant hazard potential dams are often located in predominantly rural or agricultural areas.

Dams assigned to the high hazard potential classification are those where failure or mis-operation will probably cause loss of human life. Failure of dams in the high classification will generally also result in economic, environmental or lifeline losses, but the classification is based solely on probable loss of life.

The Oregon Water and Resources Department maintains an inventory of all dams located in Oregon. There are two dams categorized as high hazard in Polk County Croft Reservoir located on Gibson Gulch, and Mercer Reservoir located on Rickreall Creek. There are also seven (7) dams categorized as significant hazard and 52 low hazard dams.

Table B-24 Polk County Dam Inventory

Threat Potential	Number of Dams	River (Dam)
High	2	Gibson Gulch (Croft Reservoir); Rickreall Creek (Mercer Reservoir)
Significant	7	Gooseneck Creek (Mt. Springs Ranch Dam); Berry Creek (Kennel Reservoir); Ash Swale (Olson Reservoir, Deraeve Reservoir #1); Tributary to Ash Creek (Koning "E" Reservoir); Tributary to King Creek (Eola Hills Reservoir); Tributary to South Yamhill River (Shaffer Reservoir)
Low	52	-
Total	**61**	

Source: Oregon Water Resources Department, "Dam Inventory Query"

Dam failures can occur at any time in a dam's life; however, failures are most common when water storage for the dam is at or near design capacity. At high water levels, the water force on the dam is higher and several of the most common failure modes are more likely to occur. Correspondingly, for any dam, the probability of failure is much lower when water levels are substantially below the design capacity for the reservoir.

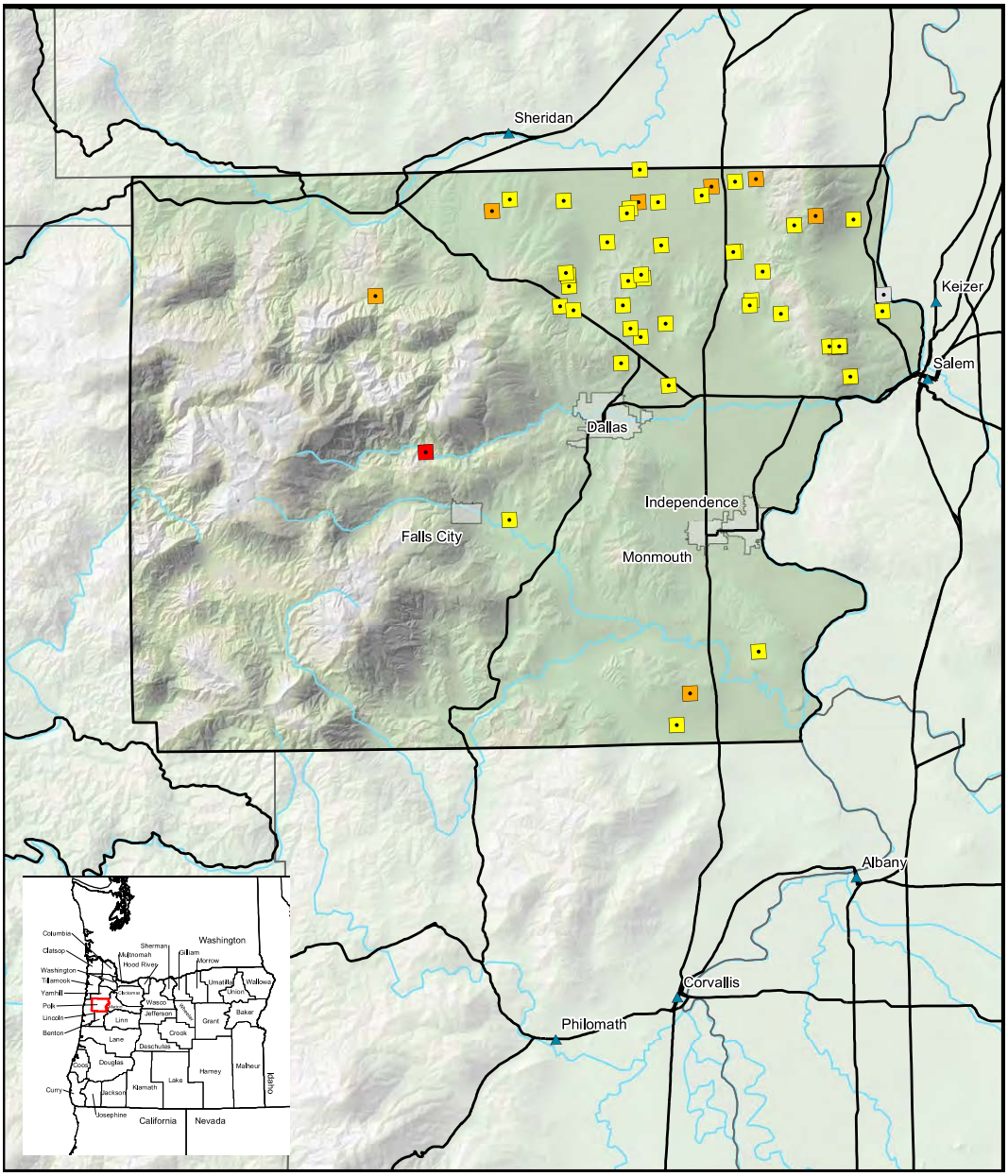
For embankment dams, the most common failure mode is erosion of the dam during prolonged periods of rainfall and flooding. When dams are full and water inflow rates exceed the capacity of the controlled release mechanisms (spillways and outlet pipes), overtopping may occur. When overtopping occurs, scour and erosion of either the dam itself and/or of the abutments may lead to partial or complete failure of the dam. Especially for embankment dams, internal erosion, piping or seepage through the dam, foundation, or abutments can also lead to failure. For smaller dams, erosion and weakening of dam structures by growth of vegetation and burrowing animals is a common cause of failure.

For embankment dams, earthquake ground motions may cause dams to settle or spread laterally. Such settlement does not generally lead, by itself, to immediate failure. However, if the dam is full, relatively minor amounts of settling may cause overtopping to occur, with resulting scour and erosion that may progress to failure. For any dam, improper design or construction or inadequate preparation of foundations and abutments can also cause failures. Improper operation of a dam, such as failure to open gates or valves during high flow periods can also trigger dam failure. For any dam, unusual hydrodynamic (water) forces can also initiate failure. Landslides into the reservoir, which may occur on their own or be triggered by earthquakes, may lead to surge waves which overtop dams or hydrodynamic forces which cause dams to fail under the unexpected load. Earthquakes can also cause seiches (waves) in reservoirs that may overtop or overload dam structures. In rare cases, high winds may also cause waves that overtop or overload dam structures.

Concrete dams are also subject to failure due to seepage of water through foundations or abutments. Dams of any construction type are also subject to deliberate damage via sabotage or terrorism. For waterways with a series of dams, downstream dams are also subject to failure induced by the failure of an upstream dam. If an upstream dam fails, then downstream dams also fail due to overtopping or due to hydrodynamic forces.

Dam failures can occur rapidly and with little warning. Fortunately, most failures result in minor damage and pose little or no risk to life safety. However, the potential for severe damage still exists.

Map B-4 Dam Location



Source: Polk County NHMP (2009).

Bridges: Because of earthquake risk, the seismic vulnerability of the county's bridges is an important issue. Non-functional bridges can disrupt emergency operations, sever lifelines, and disrupt local and freight traffic. These disruptions may exacerbate local economic losses if industries are unable to transport goods. The county's bridges are part of the state and interstate highway system that is maintained by the Oregon Department of Transportation (ODOT) or that are part of regional and local systems that are maintained by the region's counties and cities.

The bridges in Polk County require ongoing management and maintenance due to the age and types of bridges. Modern bridges, which require minimum maintenance and are designed to withstand earthquakes, consist of pre-stressed reinforced concrete structures set on deep steel piling foundations.

The table below shows the structural condition of bridges in the region. A distressed bridge is a condition rating used by the Oregon Department of Transportation (ODOT) indicating that a bridge has been identified as having a structural or other deficiency, while a deficient bridge is a federal performance measure used for non-ODOT bridges; the ratings do not imply that a bridge is unsafe.[22] The table shows that the county has a lower percentage of bridges that are distressed and/ or deficient (19.6%), than does the state (21.3%). About 12.5% of the county and 30.8 % of the city owned bridges within Polk county are distressed, compared to 28.0% of State Owned (ODOT) bridges.

Table B-25 Bridge Inventory

	Bridge Condition	Oregon	Region 3	Polk
State Owned	Distressed	610	118	14
	Sub-total	2,718	610	51
	Percent Distressed	22.4%	19.3%	28.0%
County Owned	Deficient	633	194	11
	Sub-total	3,420	942	88
	Percent Distressed	18.5%	20.6%	12.5%
City Owned	Deficient	160	44	4
	Sub-total	614	208	13
	Percent Deficient	26.1%	21.2%	30.8%
Other Owned	Deficient	40	6	1
	Sub-total	115	24	2
	Percent Deficient	34.8%	25.0%	50.0%
Area Total (All Owners)	Deficient	1,443	362	30
	Sub-total	6,769	1,741	153
	Percent Deficient	21.3%	20.8%	19.6%
Historic Covered		334	71	6

Source: Oregon Department of Transportation, 2014; Oregon Department of Transportation (2013), Oregon's Historic Bridge Field Guide

[22] Oregon. Bridge Engineering Section (2012). 2012 Bridge Condition Report. Salem, Oregon: Bridge Section, Oregon Department. of Transportation.

Note: ODOT bridge classifications overlap and sub-total is not used to calculate percent distressed, calculation for ODOT distressed bridges accounts for this overlap.

Utility lifelines: are the resources that the public relies on daily, (i.e., electricity, fuel and communication lines). If these lines fail or are disrupted, the essential functions of the community can become severely impaired. Utility lifelines are closely related to physical infrastructure, (i.e., dams and power plants) as they transmit the power generated from these facilities.

Most of the natural gas Oregon uses originates in Alberta, Canada. Northwest Natural Gas owns the main natural gas transmission pipeline. The network of transmission lines running through the county may be vulnerable to severe, but infrequent natural hazards, such as windstorm, winter storms, and earthquakes.

Seismic lifeline routes help maintain transportation facilities for public safety and resilience in the case of natural disasters. Following a major earthquake, it is important for response and recovery agencies to know which roadways are most prepared for a major seismic event. The Oregon Department of Transportation has identified lifeline routes to provide a secure lifeline network of streets, highways, and bridges to facilitate emergency services response after a disaster.[23]

System connectivity and key geographical features were used to identify a three-tiered seismic lifeline system. Routes identified as Tier 1 are considered the most significant and necessary to ensure a functioning statewide transportation network. The Tier 2 system provides additional connectivity to the Tier 1 system, it allows for direct access to more locations and increased traffic volume capacity. The Tier 3 lifeline routes provide additional connectivity to the systems provided by Tiers 1 and 2.

The Lifeline Routes in the Valley Geographic Zone (which includes Polk County) consist of the following:

- Tier I: none in Polk County
- Tier II: OR 99W
- Tier III: OR 22 from OR 99W to Salem

Confederated Tribes of Grande Ronde

Confederated Tribes of Grande Ronde maintain their own services that are on tribal trust lands. Their facilities include the Confederated Tribes of the Grand Ronde Governess Building (9615 Grand Ronde Road, Grand Ronde) and Spirit Mountain Casino (27100 Salmon River Hwy, Grand Ronde).

Synthesis

The planning considerations seemingly most significant for the county are contingency planning for medical resources and lifeline systems due to the imminent need for these resources. As mentioned above, functionality of hospitals and dependent care facilities are a

[23] CH2MHILL, Prepared for Oregon Department of Transportation. Oregon Seismic Lifeline Routes Identification Project, *Lifeline Selection Summary Report,* May 15 2012.

significant priority in providing for Polk County residents. One factor that is critical to consider in planning is the availability of medical beds in local hospitals and dependent care facilities. In the event of a disaster, medical beds may be at a premium providing not just for the growing elderly population, but the entire county. Some of these facilities may run at almost full capacity on a daily basis, hospitals should consider medical surge planning and develop memorandums with surrounding counties for medical transport and treatment. Other facilities to consider are utility lifelines and transportation lifelines such as, airports, railways, roads and bridges with surrounding counties to acquire utility service and infrastructure repair.

While these elements are traditionally recognized as part of response and recovery from a natural disaster, it is essential to start building relationships and establishing contractual agreements with entities that may be critical in supporting community resilience.

Community Connectivity Capacity

Community connectivity capacity places strong emphasis on social structure, trust, norms, and cultural resources within a community. In terms of community resilience, these emerging elements of social and cultural capital will be drawn upon to stabilize the recovery of the community. Social and cultural capitals are present in all communities; however, it may be dramatically different from one city to the next as these capitals reflect the specific needs and composition of the community residents.

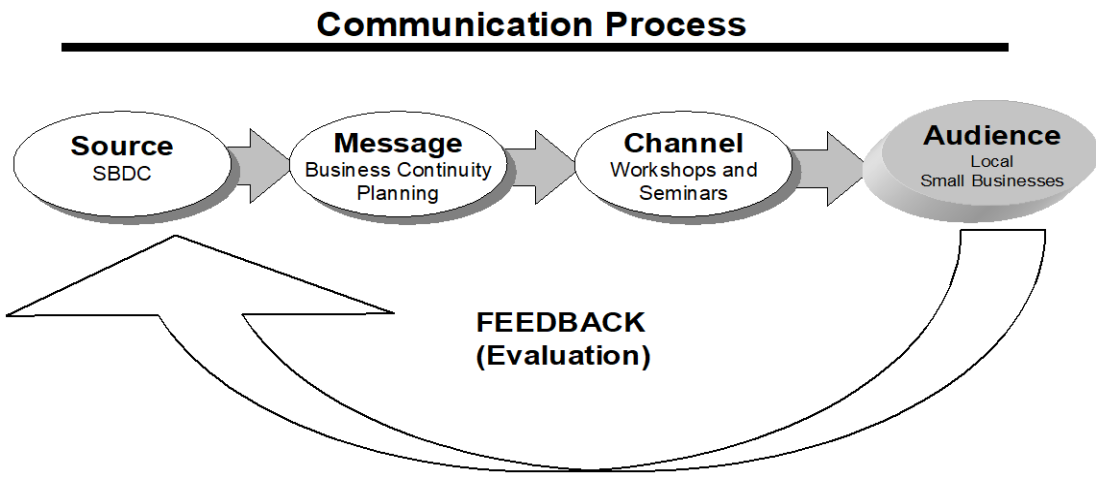
Social Systems and Service Providers

Social systems include community organizations and programs that provide social and community-based services, such as employment, health, senior and disabled services, professional associations and veterans' affairs for the public. In planning for natural hazard mitigation, it is important to know what social systems exist within the community because of their existing connections to the public. Often, actions identified by the plan involve communicating with the public or specific subgroups within the population (e.g. elderly, children, low income, etc.). The county can use existing social systems as resources for implementing such communication-related activities because these service providers already work directly with the public on a number of issues, one of which could be natural hazard preparedness and mitigation. The presence of these services are more predominantly located in urbanized areas of the county, this is synonymous with the general urbanizing trend of local residents.

The following is a brief explanation of how the communication process works and how the community's existing social service providers could be used to provide natural hazard related messages to their clients.

- There are five essential elements for communicating effectively to a target audience:
- The source of the message must be credible,
- The message must be appropriately designed,
- The channel for communicating the message must be carefully selected,
- The audience must be clearly defined, and
- The recommended action must be clearly stated and a feedback channel established for questions, comments and suggestions.

Figure B-6 Communication Process



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

The following table provides a list of existing social systems within Polk County. The table provides information on each organization or program's service area, types of services offered, populations served, and how the organization or program could be involved in natural hazard mitigation. The three involvement methods identified in the table are defined below:

- Education and outreach – organization could partner with the community to educate the public or provide outreach assistance on natural hazard preparedness and mitigation.
- Information dissemination – organization could partner with the community to provide hazard related information to target audiences.
- Plan/project implementation – organization may have plans and/or policies that may be used to implement mitigation activities or the organization could serve as the coordinating or partner organization to implement mitigation actions.

The information provided in the table can also be used to complete action item worksheets by identifying potential coordinating agencies and internal and external partners.

Civic Engagement

Civic engagement and involvement in local, state and national politics are important indicators of community connectivity. Those who are more invested in their community may have a higher tendency to vote in political elections. The 2016 Presidential General Election resulted in 80.2% voter turnout in the county.[24] These results are relatively equal to voter participation reported across the State (80.3%).[25] Other indicators such as volunteerism, participation in formal community networks and community charitable contributions are examples of other civic engagement that may increase community connectivity.

[24] Oregon Blue Book, Voter Participation, http://sos.oregon.gov/elections/Documents/statistics/participation-stats-11-2016.pdf

[25] Ibid.

Cultural Resources: The cultural and historic heritage of a community is more than just tourist charm. For families that have lived in the county for generations and new resident alike, it is the unique places, stories, and annual events that make Polk County an appealing place to live. The cultural and historic assets in the county are both intangible benefits and obvious quality-of-life- enhancing amenities. Mitigation actions to protect these assets span many of the other systems already discussed. Some examples of that overlap could be seismic retrofit (preserving historic buildings and ensuring safety) or expanding protection of wetlands (protect water resources and beautify the county).

As part of the public outreach survey, county residents catalogued numerous cultural and historic assets including:

Parks and recreational facilities: Ballston Park, Buell Park, Buena Vista Park, Eola Heights Park, Mill Creek Park, Nesmith Park, Ritner Creek Park, Ritner Creek Bridge, Social Security Fishing Hole, Dallas Aquatic Center.

Environmental attractions: Valley of the Giants Nature Preserve, Baskett Slough National Wildlife Refuge.

Historic buildings and places: Beulah Methodist Episcopal Church; Brunk, Harrison, House; Cooper, James s. and Jennie M., House; Craven, Joseph and Priscilla, House; Davidson, Dr. John E. and Mary D., House; Domes, Walter J., House; Eldridge, Kersey C., House; Fort Yamhill Site; Graves-Fisher-Strong House; Harritt, Jesse and Julia, House; Howell, John W., House; Independence Historic District; Independence National Bank (Citizens Valley Bank); Parker School; Phillips, John, House; Polk County Bank; Pumping Station Bridge; Riley-Cutler House; Ritner Creek Bridge; Saint Patrick's Roman Catholic Church (Methodist Episcopal Church, South); Sherman, Eleanor, House; Spring Valley Presbyterian Church; Well, George A., Jr., House; West Salem City Hall, Old (West Salem Library Building); Wheeler, J. A., House; Wilson, A.K., Building (Stafrin Drug Store/Greenwood Building)[26].

Public gathering places: Rock Creek campus, Cedar Mill library, Rock Creek Tavern.

Community Stability

Community stability is a measure of rootedness in place. It is hypothesized that resilience to a disaster stems in part from familiarity with place, not only for navigating the community during a crisis, but also accessing services and other supports for economic or social challenges.[27]

Residential Geographic Stability

The table below estimates residential stability across the region. It is calculated by the number of people who have lived in the same house and those who have moved within the same county a year ago, compared to the percentage of people who have migrated into the region. Polk County overall has a geographic stability rating of about 89.2% (i.e., 89.2% of the population lived in the same house or moved within the county). Falls City has the

[26] "Oregon Historic Sites Database." Oregon Historic Sites Database. Accessed August 10, 2016. http://heritagedata.prd.state.or.us/historic/.
[27] Cutter, Susan, Christopher Burton, Christopher Emrich. "Disaster Resilience Indicators for Benchmarking Baseline Conditions". Journal of Homeland Security and Emergency Management.

highest geographic stability (92.8%) while Monmouth has the lowest (76.8%, due in large part to Western Oregon University). Countywide, about 11% of residents in 2015 lived outside of Polk County one year before.

Table B-26 Regional Residential Stability

Jurisdiction	Population	Geographic Stability	Same House	Moved Within Same County
Polk	76,484	89.2%	80.9%	8.3%
Dallas	14,631	90.7%	77.7%	13.0%
Falls City	988	92.8%	87.6%	5.2%
Independence	8,631	89.2%	77.8%	11.4%
Monmouth	9,823	76.8%	61.5%	15.3%

Source: Social Explorer, Table 130, U.S. Census Bureau, 2011-2015 American Community Survey Estimates

Homeownership

Housing tenure describes whether residents rent or own the housing units they occupy. Homeowners are typically more financially stable but are at risk of greater property loss in a post-disaster situation. People may rent because they choose not to own, they do not have the financial resources for home ownership, or they are transient.

Collectively, about 64.3% of the occupied housing units in Polk County are owner-occupied; about 35.7% are renter occupied. Falls City (82.9%) has the highest rate of owner-occupied units. Monmouth (51.7%) and Independence (45.1%) have the highest rate of renter-occupied households. Falls City (9.2%) and Independence (8.4%) have the highest vacancy rates within the county. In addition, seasonal or recreational housing accounts for approximately 11% of the county's vacant housing stock.[28]

Table B-27 Housing Tenure and Vacancy

	Housing Units	Owner-occupied		Renter-occupied		Vacant^	
		Estimate	Percent	Estimate	Percent	Estimate	Percent
Polk County	30,651	18,292	64.3%	10,166	35.7%	1,944	6.3%
Dallas	5,907	3,595	63.4%	2,072	36.6%	228	3.9%
Falls City	393	296	82.9%	61	17.1%	36	9.2%
Independence	3,200	1,610	54.9%	1,322	45.1%	268	8.4%
Monmouth	3,687	1,690	48.3%	1,810	51.7%	172	4.7%

Source: Social Explorer, Table 94, U.S. Census Bureau, 2011-2015 American Community Survey Estimates
* = Functional vacant units, computed after removing seasonal, recreational, or occasional housing units from vacant housing units.

According to Cutter, wealth increases resiliency and recovery from disasters. Renters often do not have personal financial resources or insurance to assist them post-disaster. On the other hand, renters tend to be more mobile and have fewer assets at risk of natural

[28] U.S. Census Bureau, 2011-2015 American Community Survey Estimates, Table B25004.

hazards.[29] In the most extreme cases, renters lack sufficient shelter options when lodging becomes uninhabitable or unaffordable post-disaster.

Synthesis

Polk County has distinct social and cultural resources that work in favor to increase community connectivity and resilience. Sustaining social and cultural resources, such as social services and cultural events, may be essential to preserving community cohesion and a sense of place. The presence of larger communities makes additional resources and services available for the public. However, it is important to consider that these amenities may not be equally distributed to the rural portions of the county and may produce implications for recovery in the event of a disaster.

In the long-term, it may be of specific interest to the county to evaluate community stability. A community experiencing instability and low homeownership may hinder the effectiveness of social and cultural resources, distressing community coping and response mechanisms.

[29] Cutter, S. L. (2003). Social Vulnerability to Environmental Hazards. *Social Science Quarterly*.

Political Capacity

Political capacity is recognized as the government and planning structures established within the community. In terms of hazard resilience, it is essential for political capital to encompass diverse government and non-government entities in collaboration; as disaster losses stem from a predictable result of interactions between the physical environment, social and demographic characteristics and the built environment.[30] Resilient political capital seeks to involve various stakeholders in hazard planning and works towards integrating the Natural Hazard Mitigation Plan with other community plans, so that all planning approaches are consistent.

Regulatory Context: Oregon Statewide Planning Goal 7

Since 1973, Oregon has maintained a strong statewide program for land use planning. The foundation of that program is a set of 19 statewide planning goals that express the state's policies on land use and on related topics, such as citizen involvement, land use planning, and natural resources.

Most of the goals are accompanied by "guidelines," which are suggestions about how a goal may be applied. Oregon's statewide goals are achieved through local comprehensive planning. State law requires each city and county to adopt a comprehensive plan and the zoning and land-division ordinances needed to put the plan into effect. The local comprehensive plans must be consistent with the statewide planning goals. Plans are reviewed for such consistency by the state's Land Conservation and Development Commission (LCDC). When LCDC officially approves a local government's plan, the plan is said to be "acknowledged." It then becomes the controlling document for land use in the area covered by that plan.

Statewide Planning Goal 7

Goal 7: Areas Subject to Natural Disasters and Hazards has the overriding purpose to "protect people and property from natural hazards." Goal 7 requires local governments to adopt comprehensive plans (inventories, policies and implementing measures) to reduce risk to people and property from natural hazards. Natural hazards include floods, landslides, earthquakes, tsunamis, coastal erosion, and wildfires.

To comply with Goal 7, local governments are required to respond to new hazard inventory information from federal or state agencies. The local government must evaluate the hazard risk and assess the:

- frequency, severity, and location of the hazard;
- effects of the hazard on existing and future development;
- potential for development in the hazard area to increase the frequency and severity of the hazard; and
- types and intensities of land uses to be allowed in the hazard area.

[30] Mileti, D. 1999. Disaster by Design: a Reassessment of Natural Hazards in the United States. Polk D.C.: Joseph Henry Press.

Local governments must adopt or amend comprehensive plan policies and implementing measures to avoid development in hazard areas where the risk cannot be mitigated. In addition, the siting of essential facilities, major structures, hazardous facilities and special occupancy structures should be prohibited in hazard areas where the risk to public safety cannot be mitigated. The state recognizes compliance with

Goal 7 for coastal and riverine flood hazards by adopting and implementing local floodplain regulations that meet the minimum National Flood Insurance Program (NFIP) requirements.

Goal 7 Planning Guidelines

- In adopting plan policies and implementing measures for protection from natural hazards, local governments should consider:
    - the benefits of maintaining natural hazard areas as open space, recreation, and other low density uses;
    - the beneficial effects that natural hazards can have on natural resources and the environment; and
    - the effects of development and mitigation measures in identified hazard areas on the management of natural resources.
- Local governments should coordinate their land use plans and decisions with emergency preparedness, response, recovery and mitigation programs.

Goal 7 Implementation Guidelines

Goal 7 guides local governments to give special attention to emergency access when considering development in identified hazard areas.

- Consider programs to manage stormwater runoff to address flood and landslide hazards.
- Consider non-regulatory approaches to help implement the goal.
- When reviewing development requests in high-hazard areas, require site. specific reports, appropriate for the level and type of hazard. Reports should evaluate the risk to the site, as well as the risk the proposed development may pose to other properties.
- Consider measures exceeding the National Flood Insurance Program.

Existing Plans and Policies

Communities often have existing plans and policies that guide and influence land use, land development, and population growth. Such existing plans and policies can include comprehensive plans, zoning ordinances, and technical reports or studies. Plans and policies already in existence have support from local residents, businesses and policy makers. Many land-use, comprehensive, and strategic plans get updated regularly, and can adapt easily to changing conditions and needs.[31]

The Polk County NHMP includes a range of recommended action items that, when implemented, will reduce the county's vulnerability to natural hazards. Many of these

[31] Burby, Raymond J., ed. 1998. Cooperating with Nature: Confronting Natural Hazards with Land-Use Planning for Sustainable Communities.

recommendations are consistent with the goals and objectives of the county's existing plans and policies. Linking existing plans and policies to the NHMP helps identify what resources already exist that can be used to implement the action items identified in the plan. Implementing the natural hazards mitigation plan's action items through existing plans and policies increases their likelihood of being supported and getting updated, and maximizes the county's resources. In addition to the plans listed below the county and incorporated cities also have zoning ordinances (including floodplain development regulations) and building regulations.

Existing plans that can incorporate mitigation actions include (for more information on these plans see the county website):

Table B-28 Legal and Regulatory Resources Available for Hazard Mitigation (Polk County)

Regulatory Tool	Name	Effect on Hazard Mitigation
Plans	Comprehensive Plan Maps	The Comprehensive Plan map, goals and policies are intended to serve as a guide for land use planning and development in Polk County.
	Natural Hazards Mitigation Plan (2017 – *pending*)	Directed mitigation activities for the planning cycle.
	Emergency Operations Plan (2017)	Identifies emergency planning, policies, procedures, and response to extraordinary emergency situations associated with natural disasters, technological incidents, and national security emergencies.
	2001 Flood Hazard Plan Appendix 1	Directed floodplain development and land use.
	Transportation Systems Plan, 2009	This plan provides a balanced transportation system that includes the automobile, bicycle, rail, transit, air, walking, and transmission systems (for example, pipelines). It reflects existing land use plans, policies and regulations that affect the transportation system and includes a finance element.
	Corridor Refinement Plan (Highway 18)	The Corridor Refinement Plan shows that fatal crashes are a major highway problem and traffic volumes along this section of highway have more than doubled since 1994. The highway is expected to have an additional 50% increase in traffic over the next 20 years. Conditions that presently exist on summer weekends will expand and will occur on weekdays from spring to fall.
Programs	National Flood Insurance Program (NFIP)	Directed floodplain development and land use and provides flood insurance for residential, business, and public entities.
	Code Compliance	Building, zoning, and other nuisance violations.

Regulatory Tool	Name	Effect on Hazard Mitigation
	Program	
	Economic Development Program	Coordination of economic development and infrastructure development activities and administering grant programs.
	Polk County Water Needs Assessment Report, 2005	The objective of this report is to provide an analysis of future water supply strategies for the citizens of Polk County. Elements of this objective include the following: - Identify the county's future needs for water - Identify the most viable long term drinking water source - Develop a preliminary plan for production and delivery - Estimate the financial impacts - Discuss potential administrative options required for financing and operation
Policies (Municipal Codes)	Polk County Zoning Ordinances	http://www.co.polk.or.us/cd/planning/polk-county-zoning-ordinance
	Polk County Floodplain Zone, Zoning Ordinance, Chapter 178	Guides land use and development within the floodplain

Table B-29 Administrative and Technical Resources for Hazard Mitigation (Polk County)

Staff/Personnel Resources	Department/Division Position
Planner(s) or engineer(s) with knowledge of land development and land management practices	County Engineer: Ken Husby County Planning: Sidney Mulder Planning Director: Austin McGuigan
Engineer(s) or professional(s) trained in construction practices related to buildings and/or infrastructure	County Engineer: Ken Husby
Planner(s) or engineer(s) with an understanding of manmade or natural hazards	County Planning: Sidney Mulder Planning Director: Austin McGuigan
Floodplain manager	Austin McGuigan
Personnel skilled in GIS and/or HAZUS-MH	Dan Anderson
Director of Emergency Services	Dean Bender
Finance (grant writers, purchasing)	Austin McGuigan
Public Information Officers	Dean Bender

Table B-30 Financial Resources for Hazard Mitigation (Polk County)

Financial Resources	Effect on Hazard Mitigation
General funds	Available for mitigation projects
Authority to levy taxes for specific purposes	(Measure 5) w/ a cap w/ voter approval (cannot exceed cap)
Incur debt through general obligation bonds	No
Incur debt through special tax and revenue bonds	Yes
Incur debt through private activity bonds	Yes

Note: See Appendix D – Grant Programs for additional financial resources.