2 Community Profile

People and places are not equally affected by natural hazards. People with more economic, social or political capital are likely to better withstand disaster events and to bounce back more quickly. Structures outside hazard areas and constructed to higher building standards are more resilient[1] to natural hazards. Looking at our community through the lens of equity — how people and places are differently situated — increases our understanding of the disproportionate vulnerability[2] to hazards across the Planning Area.

*The **Community Profile** takes a closer look at trends in geography, environment, demography, economy, housing, transportation, utilities, historic and cultural resources, critical facilities and infrastructure, land use and development, and community connectivity. The trends indicate that some people and places are more likely than others to experience greater impacts from natural hazards. These vulnerability trends ultimately inform the mitigation strategy.*

A Note About Data in the Community Profile

While this plan does not include the City of Portland overall, some data for the Community Profile was available only at the Multnomah County level, which includes the City of Portland. As such, for consistency, the Community Profile includes data for all unincorporated areas and cities within the county, including the City of Portland. When available, data are categorized by each city and unincorporated area. Census data for the county's unincorporated areas are divided into these Rural Planning Areas: West Hills, Sauvie Island & West Hills, West of Sandy River, and East of Sandy River.

2.1 Political and Physical Geography

2.1.1 Geopolitical Boundaries

Multnomah County was created on December 24, 1854, from the eastern part of Washington County and the northern part of Clackamas County. Multnomah County is bordered by Columbia County and the Columbia River on the north, Hood River County on the east, Clackamas County on the south, and Washington County on the west. Multnomah is the smallest county in Oregon, with a total area of 466 square miles.

Multnomah County contains six incorporated cities (Portland, Gresham, Maywood Park, Fairview, Wood Village and Troutdale) and part of a seventh city, Lake Oswego, which is predominantly in Clackamas County. Portland and Gresham are the first and fourth largest cities in Oregon, respectively. The county

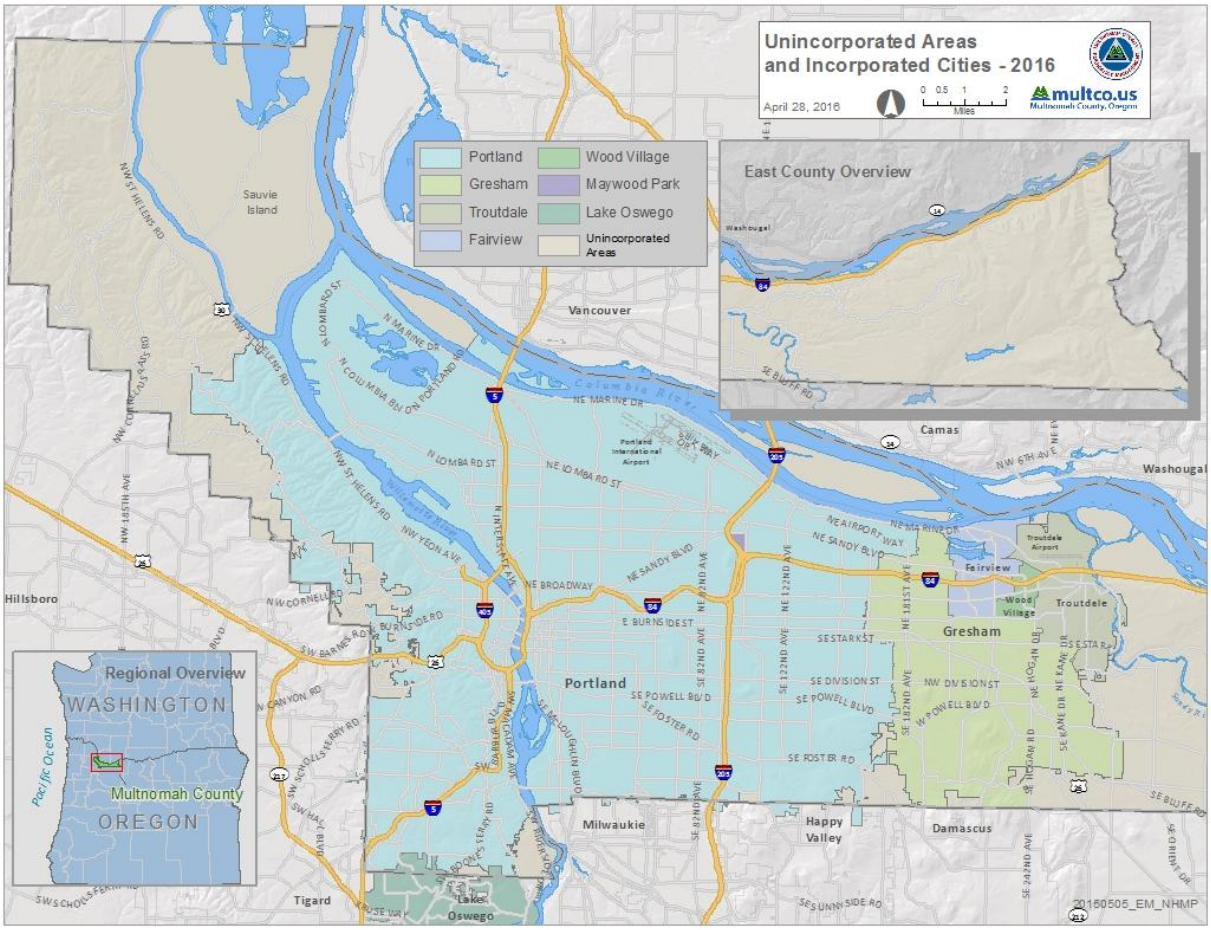
1 Resilience is essentially the flip side of vulnerability. It is the ability to "survive, adapt, and grow in the face of stress and shocks, and even transform when conditions require it" (The Rockefeller Foundation, no date).

2 Vulnerability is the degree to which people, property, resources, systems and cultural, economic, environmental and social activity is subject to harm, degradation or destruction. (PBEM, 2012)

also contains large unincorporated areas in the northwest and eastern parts of the county. **Figure 2.1-1** shows the locations of the cities and the unincorporated portions of the county, which are divided into Rural Planning Areas. The year of incorporation and area occupied by cities covered in this plan include:

- Gresham, incorporated in 1905, is 23.4 square miles
- Troutdale, incorporated in 1907, is 5.0 square miles
- Fairview, incorporated in 1908, is 3.5 square miles
- Wood Village, incorporated in 1951, is 1.0 square mile

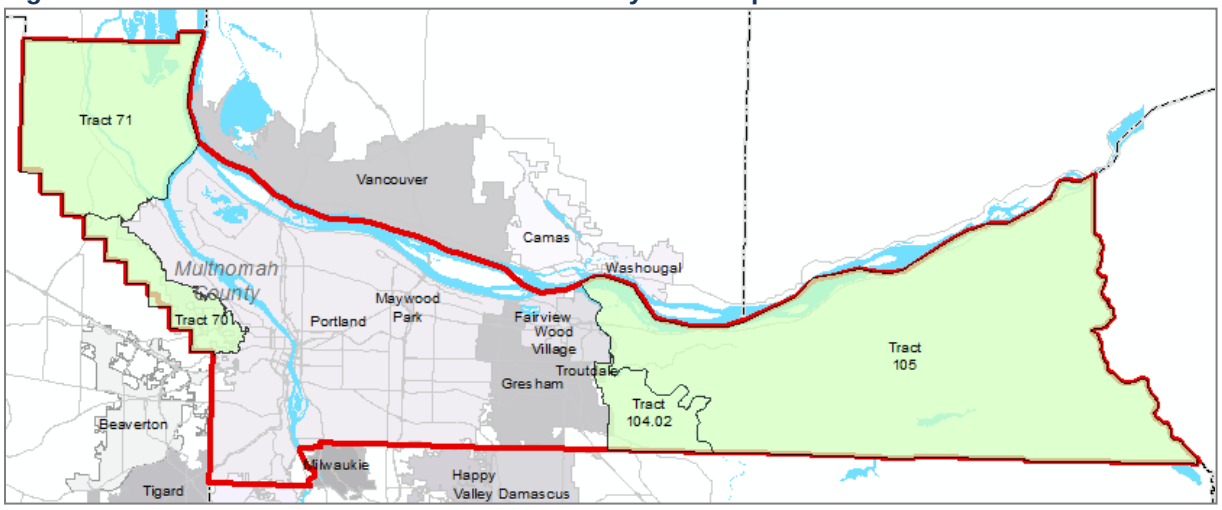
Figure 2.1-1: Multnomah County Incorporated Cities and Unincorporated Areas



Source: Multnomah County, 2016

Because the unincorporated area of the county is made up of distinct community areas, this analysis reports demographic data to align as closely as possible to the county's Rural Planning Area boundaries. The census tract is the smallest geographic unit at which the majority of the demographic data is available. The following census geographies are used, as shown in **Figure 2.1-2**: West Hills = Tract 70; Sauvie Island & West Hills = Tract 71; West of Sandy River = Tract 104.02; and East of Sandy River = Tract 105.

Figure 2.1-2: Census Tracts for Multnomah County Unincorporated Areas



Source: U.S. Census Bureau

2.1.2 Geography and Geology

The topography of Multnomah County varies from flat to gently hilly terrain along the Willamette River and along the lower reaches of the Columbia River, to hilly in Portland's West Hills. Much of eastern Multnomah County from the Sandy River watershed eastward is hilly to mountainous. The highest location in Multnomah County is Buck's Peak, near Lost Lake, with an elevation of 4,751 feet. Areas with steep slopes may be susceptible to landslides. See **3.3 Landslide** for more information about steep slopes. The vegetation and trees in these areas may also make them more vulnerable to wildfires. See section **3.6 Wildfire** for more information.

Multnomah County is located in a geologically active area. There are several active earthquake faults within the county and many other faults nearby, including the Cascadia Subduction Zone. A Cascadia Subduction Zone earthquake of a magnitude of 8.0 or higher is projected for the Pacific Northwest, and its impact will be catastrophic. The county also is close to active volcanoes, including Mount Hood in Clackamas County, Oregon, and Mt. St. Helens in Washington State. Earthquakes and volcanic hazards are addressed in sections **3.1** and **3.5** respectively.

The two major rivers in Multnomah County are the Columbia River, which forms much of the northern boundary of the county, and the Willamette River, which flows through Portland. There are levees on the Columbia River that protect the area from most flooding. The levees are in Multnomah County and are maintained by the Multnomah County Drainage District.

The Sandy River, a tributary of the Columbia River, is another significant river in the county. There are floodplains mapped by the Federal Emergency Management Agency (FEMA) along these three rivers, as well as along many smaller streams. See **3.2. Flood** for more information about floodplain maps.

There are several small lakes in the county, including Blue Lake, Fairview Lake, Fairview Creek and its tributaries, Salish Ponds, Sturgeon, and Bybee and Smith Lakes, which are remnants of old channels of the Columbia River.

2.1.3 Climate

The climate across Multnomah County is moderate, and generally consists of wet winters and dry summers. Several climactic factors contribute to hazard vulnerability in Multnomah County, particularly during the wet winter months. Heavy winter rains can result in flooding and contribute to landslide vulnerability. Cold snaps can result in ice and snowstorms. High winds often accompany winter storms. All of these climactic events are regional in nature, typically affecting all of Multnomah County.

Temperature and Precipitation

Temperature and precipitation vary significantly across the county, depending on elevation. Higher elevations have lower temperatures and substantially higher precipitation. Mean daily temperatures range from highs around 81° Farenheit (F) and lows around 54° F in July and August to highs around 45° F and lows around 34° F in December and January.

Most of the precipitation falls between October and May (personal communication with Tyree Wilde, National Weather Service, 2016). **Table 2.1-1** shows average annual precipitation ranges from about 37 to 45 inches. However, parts of the West Hills may average 70 inches, and high elevations in eastern Multnomah County may average 150 inches. Precipitation is significantly higher in the West Hills and the high elevation areas in eastern Multnomah County than in the lower elevation areas within the Willamette and Columbia River valleys. Monthly precipitation averages vary from about 6 to 7 inches in November through January to about 0.75 inches in July. See **3.4 Severe Weather** for additional information about precipitation.

Table 2.1-1: Precipitation in Multnomah County

Location	Average Annual Precipitation (inches)	Period of Record	Lowest Annual Precipitation (inches)	Highest Annual Precipitation (inches)	Period of Record
Portland Airport (Portland WFSO station 356751)	37.53	11/1/1941 to 12/31/2005	22.48	63.20	1940-2015
Troutdale Airport (Troutdale station 358654)	44.68	7/1/1948 to 12/31/2005	29.52	66.43	1948-2015

Source: Western Regional Climate Center, no date; Tyree Wilde, National Weather Service, 2016

Snow

On average, the region experiences only five days per year of measurable snow. While snow is relatively rare in western Oregon, the Columbia Gorge provides a low-level passage through the mountains. Cold air, which lies east of the Cascades, often moves westward through the gorge and funnels cold air into the area. If a wet Pacific storm reaches the area at the same time as cold westward winds from the gorge, significant snows storms, and even ice storms, may result (Taylor and Hannan, 1999). Ice storms can take the form of freezing rain, sleet, and hail (Taylor and Hannan, 1999).

Average annual snowfall is about 5 inches, although many years have had no measurable snowfall. Snowfall is significantly higher in the West Hills and much higher in the high elevation areas in eastern Multnomah County. Section **3.4 Severe Weather** provides additional details on snow and ice.

Climate Change

According to the Oregon Natural Hazards Mitigation Plan (2015), the most reliable information on climate change is at the state level. Based on state-level data, hazards in Multnomah County projected to be impacted by climate change include drought, wildfire, flooding and landslides. Climate models project the following for areas within Multnomah County (Oregon Department of Land Conservation and Development [DLCD], 2015):

- Warmer drier summers and a decline in mean summer precipitation
- Decreases in mountain snowpack due to warmer winter temperatures
- Increased incidence of drought and wildfire
- More frequent flooding and landslides
- Increases in extreme precipitation for some areas
- Greater risk of flooding in certain basins, including an increased incidence of stronger floods occurring more frequently (increased magnitude and return interval)
- Increased incidence of landslides due to increased [extreme] rainfall events

There is little research on how climate change influences winter storms in the Pacific Northwest (DLCD, 2015).

Additional information about the projected impacts of climate change on individual hazards is found in each hazard risk assessment included in **3 Hazard Identification and Risk Assessment.**

2.2 Demography

2.2.1 Population

Multnomah County's estimated population for 2015 was 777,490 people, making it the most populated county in Oregon (**Table 2.2-1**). The county's population has grown at a more rapid rate in the past five years than the state as a whole. Other counties in the Portland metropolitan area, including Washington and Clackamas counties, also have had large increases in population (Population Research Center, 2015). About 56% of Multnomah County's population increase has been a natural increase (births minus deaths), while the remainder has been from net migration (Population Research Center, 2015). The Office of Economic Analysis (2013) forecasts Multnomah County will increase its population by another 38,500 people between 2015 and 2020, a 0.9% annual growth rate.

Table 2.2-1: Population and Estimated Change, 2010-2014/2015

	2010		2014/2015		Population Change 2010-2014/2015		Average Annual Growth Rate
	Population	% of County	Population	% of County	Population Change	Percent Change	
Oregon	3,831,074	-	4,013,845	-	182,771	4.8%	1.2%
Multnomah County	735,334	100%	777,490	100%	42,156	5.7%	1.4%
Incorporated	718,882	97.8%	750,040	96.5%	31,158	4.3%	1.1%
Fairview	8,920	1.2%	8,940	1.1%	20	0.2%	0.1%
Gresham	105,594	14.4%	107,065	13.8%	1,471	1.4%	0.3%
Maywood Park	752	0.1%	750	0.1%	-2	-0.3%	-0.1%
Portland	583,776	79.4%	613,355	78.9%	29,579	5.1%	1.2%
Troutdale	15,962	2.2%	16,020	2.1%	58	0.4%	0.1%
Wood Village	3,878	0.5%	3,910	0.5%	32	0.8%	0.2%
Unincorporated[1]	16,452	2.2%	27,450	3.5%	10,998	66.8%	18.6%
West Hills[2]	8,181	1.1%	8,104	1.0%	-77	-0.9%	-0.3%
Sauvie Island & West Hills	2,759	0.4%	2,650	0.3%	-109	-4.0%	-1.3%
West of Sandy River	6,135	0.8%	6,181	0.8%	46	0.8%	0.2%
East of Sandy River	3,926	0.5%	4,308	0.6%	382	1.0%	2.3%

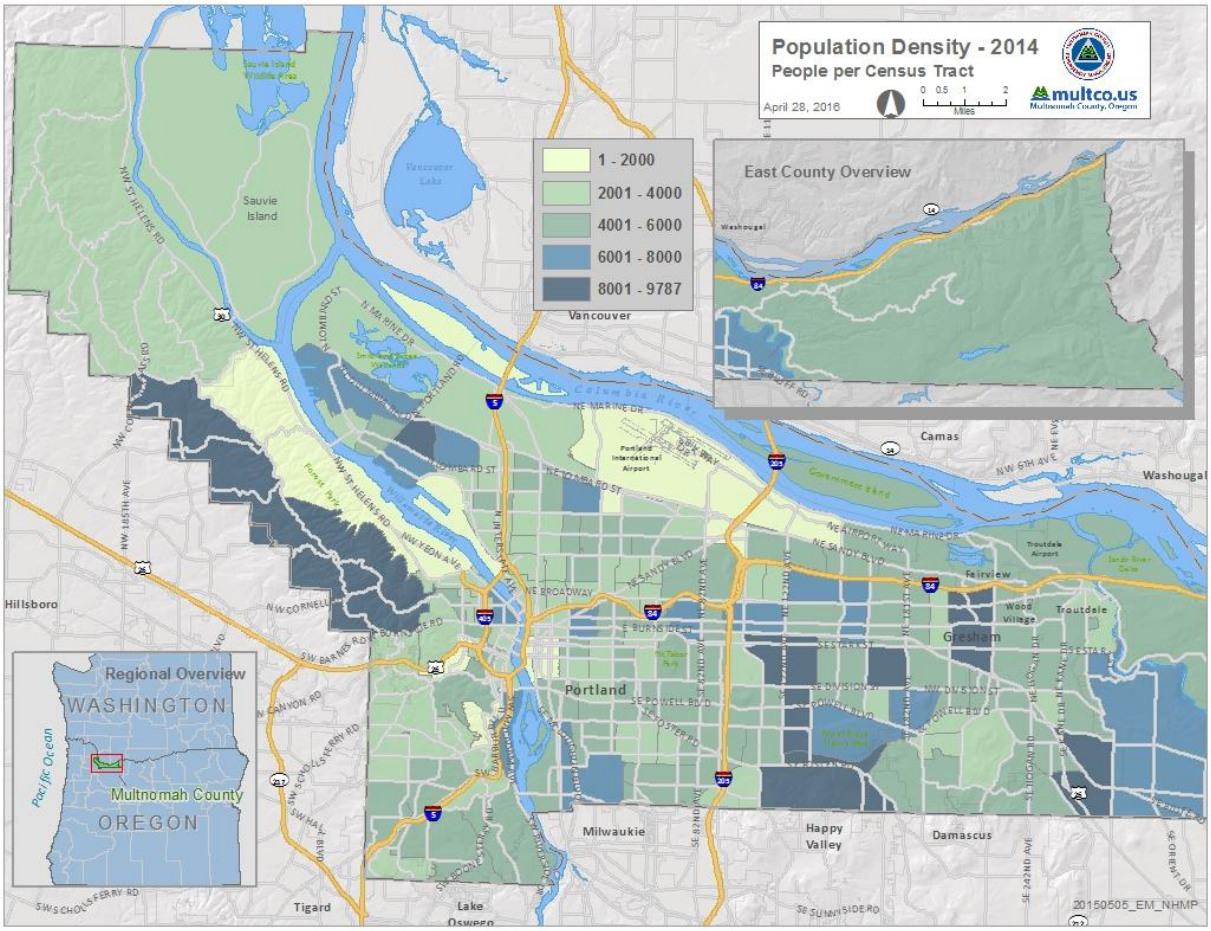
Source: U.S. Census Bureau, 2010 Census; U.S. Census Bureau, 2010-2014 American Community Survey, 5-Year Estimates (for West and East County subareas); Population Research Center Portland State University, Certified Population Estimates 2015.

The majority of Multnomah County's residents, approximately 96.5%, reside within incorporated cities. The most populated cities in Multnomah County are Portland (613,355) and Gresham (107,065). Approximately 29,620 people reside in the four smaller cities, Fairview, Maywood Park, Troutdale and Wood Village, and another 27,450 people live in unincorporated communities, which are defined by Rural Planning Areas **(Figure 2.2-1).**

[1] Unincorporated totals are calculated by subtracting incorporated totals from Multnomah County totals. The census tracts used to report data for the unincorporated Planning Areas overlap slightly with incorporated areas, resulting in overestimates of rural populations. The unincorporated Planning Areas as presented do not equal the unincorporated totals.

[2] Because the unincorporated area of the county is made up of distinct community areas, this analysis reports demographic data to align as closely as possible to the county's Rural Planning Area boundaries.

Figure 2.2-1: Total Population



Source: U.S. Census, 2014

2.2.2 Individuals Experiencing Homelessness

In 2015, Multnomah County conducted a study to count the number of individuals and families without shelter. The study found that 1,887 individuals were without shelter, 872 were sleeping in emergency shelters, and 1,042 were in transitional housing. Among these 3,801 individuals: 41% were people of color, 17% were families with children (including 369 children), 31% were women, 7% were youth ages 24 and younger, 12% were veterans, 57% had disabling conditions, and 46% were chronically homeless (Kristina Smock Consulting, 2015).

"About 4,000 people sleep on the streets, in cars, in shelters or in temporary housing each night because they cannot afford a permanent place to live in Multnomah County."

- Multnomah County and City of Portland's Joint Office on Homeless Services, 2016

People experiencing homelessness have limited resources to evacuate, stockpile food, store medications and shelter in place. They also may lack access to mainstream modes of emergency notification (Edgington, 2009). The circumstances of homelessness also contribute to high rates of mental illness, addiction, and poor physical health (Edgington, 2009). People without shelter have likely had past exposure to traumatic events and therefore

may be at higher risk of adverse psychological reactions following a disaster (Public Health Emergency, 2013). Mitigation planning for this population should include subject matter experts who provide services to people experiencing homeless.

2.2.3 Tourists

Multnomah County has the largest estimated overnight visitor volume of Oregon counties. Approximately one-third of tourist visits occur between July and September (Longwoods International, 2013). In 2014, 4.8 million people made a trip to Multnomah County that included an overnight stay (Dean Runyan Associates, 2015). A majority of those visits were spent in hotel/motel accommodations (3 million), while 1.7 million people stayed in a private home and another 137,000 stayed in other overnight accommodations (Dean Runyan Associates, 2015). The eastern portion of Multnomah County has seen larger increases in tourism from 2013 to 2014 than the western portion of the county (Dean Runyan Associates, 2015). The number of tourists in Multnomah County has been increasing steadily since 1991.

Tourists may not know about local hazards or emergency notification and response practices. They usually are not equipped with emergency supplies. As such, tourists can quickly become vulnerable in emergency situations.

2.2.4. Migrant and Seasonal Farm Workers

It is extremely difficult to estimate the number of migrant and seasonal farm workers at the county level, as the number of individuals employed in agricultural occupations changes each season. In addition, migrant and seasonal farm workers often are accompanied by family members and others. A recent study attempted to estimate the number of farm workers in Oregon. In Multnomah County, the study identified approximately 1,700 workers accompanied by 1,238 non-farm workers present in the household, for a total of 2,983 persons (Larson, 2013). Migrant and seasonal farm workers may be especially vulnerable to disasters for a number of reasons, including immigration status, limited English proficiency, low income and quality of housing. Like tourists, most migrant and seasonal workers may not be aware of local hazards and emergency notification and response practices, and may not have emergency supplies.

2.2.5 Daytime Population

Multnomah County is an employment center for the region. As such, many workers commute to the county from other areas. The 2013 American Community Survey estimated 465,290 workers in Multnomah County commute from a residence outside the county. People commuting to Multnomah County for work may be aware of the hazards in the area, but are unlikely to be travelling with emergency supplies.

2.2.6 Age

In Multnomah County, 20.1% of the population is under the age of 18 and 11.2% is 65 years or older (**Table 2.2-2**). By 2025, the percentages of children and elders are forecast to increase as follows: 22.8% of the population will be 18 years of age or younger and 16.4% will be 65 years or older (Office of Economic Analysis, 2013). Wood Village and Troutdale have a large percentage of the population under 18 years of age (30.7% and 27.4% respectively). Sauvie Island and the area east of the Sandy River have a high percentage of older residents and also high percentages of elders living alone.

Children and elders are the most vulnerable age groups in a disaster. Children can have difficulty coping with a disaster situation. Often communities have not planned for the resources necessary to care for children after a disaster. Many older adults have physical, sensory or cognitive challenges. This is

especially a concern for elders living alone. Family or neighbors might be less able to assist an elder during a crisis (Flanagan, Gregory, Hallisey, Heitgerd, & Lewis, 2011).

Table 2.2-2: Children, Elders and Elders Living Alone

Community	Under 18 years	Percent of Total Population	65 years and older	Percent of Total Population	Householder living alone, 65 years and older	Percent of Total Households
Oregon	860,089	22.1%	582,273	14.9%	159,817	10.5%
Multnomah	152,034	20.1%	84,865	11.2%	26,818	8.7%
Fairview	2,033	22.4%	1,140	12.5%	288	7.5%
Gresham	27,550	25.5%	12,745	11.8%	3,608	9.4%
Maywood Park	178	19.9%	140	15.7%	32	8.7%
Portland	113,246	18.8%	66,043	11.0%	21,883	8.7%
Troutdale	4,480	27.4%	1,373	8.4%	236	4.1%
Wood Village	1,212	30.7%	307	7.8%	68	5.3%
Unincorporated Planning Areas						
West Hills	2,154	26.2%	934	11.3%	140	4.5%
Sauvie Island & West Hills	350	13.8%	448	17.7%	138	12.1%
West of Sandy River	1,427	23.1%	672	10.9%	201	9.2%
East of Sandy River	1,009	23.4%	731	17.0%	172	11.1%

Source: U.S. Census Bureau, 2010-2014 American Community Survey 5-Year Estimates

2.2.7 Individuals with a Disability

Individuals with disabilities may require the assistance of others or special resources in a disaster. The American Community Survey estimates disability status based on the following six disability types:

- **Hearing difficulty:** Deaf or having serious difficulty hearing
- **Vision difficulty**: Blind or having serious difficulty seeing, even when wearing glasses
- **Cognitive difficulty:** Because of a physical, mental or emotional problem, having difficulty remembering, concentrating or making decisions
- **Ambulatory difficulty:** Having serious difficulty walking or climbing stairs
- **Self-care difficulty:** Having difficulty bathing or dressing
- **Independent living difficulty:** Because of a physical, mental or emotional problem, having difficulty doing errands alone such as visiting a doctor's office or shopping

Approximately 12.2% of the non-institutionalized population in Multnomah County has a disability (**Table 2.2-3**). Of the population 65 years and older, 39.1% have one or more disabilities. Notably, more than half the elderly population in Fairview, 536 people, have a disability, A small percentage of children within the county have a disability and a majority of those children reside in Portland and Gresham.

Table 2.2-3: Persons with a Disability

Community	Total Civilian Non-institutionalized	With a Disability	Percent of Total Population	Under 18 Years with a Disability	Percent Under 18 Years	65 Years and Over with a Disability	Percent of 65 Years and Over Population
Oregon	3,829,588	526,868	13.8%	38,775	4.5%	207,477	37.7%
Multnomah	741,593	90,223	12.2%	6,475	4.3%	31,015	39.1%
Incorporated	725,887	88,730	12.2%	6,359	4.3%	30,385	39.8%
Fairview	9,003	1,457	16.2%	91	4.1%	536	51.3%
Gresham	106,480	15,753	14.8%	1,781	6.4%	4,788	41.9%
Maywood Park	939	105	11.2%	12	5.6%	30	22.4%
Portland	589,506	68,974	11.7%	4,336	3.9%	24,300	39.0%
Troutdale	16,071	1,933	12.0%	88	2.2%	606	47.1%
Wood Village	3,888	508	13.1%	51	4.1%	125	48.6%
Unincorporated Planning Areas							
West Hills	8,104	360	4.4%	12	0.6%	154	19.7%
Sauvie Island & West Hills	2,650	236	8.9%	0	0.0%	84	19.4%
West of Sandy River	6,014	663	11.0%	25	1.8%	296	45.3%
East of Sandy River	4,538	637	14.0%	80	7.3%	220	33.1%

Source: U.S. Census Bureau, 2009-2013 American Community Survey 5-Year Estimates

The U.S. Department of Health and Human Services provides aggregated data on Medicare beneficiaries who rely on electricity-dependent medical and assistive equipment, such as ventilators or electric wheelchairs, and are therefore at increased risk from power outages. There are 3,740 persons in Multnomah County who are electricity-dependent. The east Portland area and Gresham have higher concentrations of individuals who rely on such medical and assistive equipment compared to other areas in the county (U.S. Department of Health and Human Services, no date).

2.2.8 Minority Status

The social and economic marginalization of certain racial and ethnic groups, including real estate discrimination, makes these populations more vulnerable at all stages of disaster (Flanagan, Gregory, Hallisey, Heitgerd, & Lewis, 2011). Historically, African Americans, Native Americans, and populations of Asian, Pacific Islander or Hispanic origin have been strongly correlated with higher vulnerability before and after disasters (Flanagan, Gregory, Hallisey, Heitgerd, & Lewis, 2011).

In Multnomah County, the majority of the population, 78%, is white (**Table 2.2-4**). Asian and African American racial minority groups are the largest in the county, 6.8% and 5.7% respectively. The highest percentages of people of color reside in the county's incorporated area, with Wood Village and Portland having the highest percent non-white population. Hispanic or Latino persons make up 10.9% of the county's population. Wood Village has the highest percent of Hispanic/Latino persons, 34.6%, followed by Gresham, Fairview and Sauvie Island. **(Figure 2.2-2)**

The county's racial and ethnic diversity has increased over the past decade. Between 2000 and 2011, the Latino population increased by 8% (Multnomah County Health Department, 2014). During this same time, the African American, Asian/Pacific Islander and American Indian/Alaska Native populations remained approximately the same size. Conversely, the non-Latino white population decreased (Multnomah County Health Department, 2014).

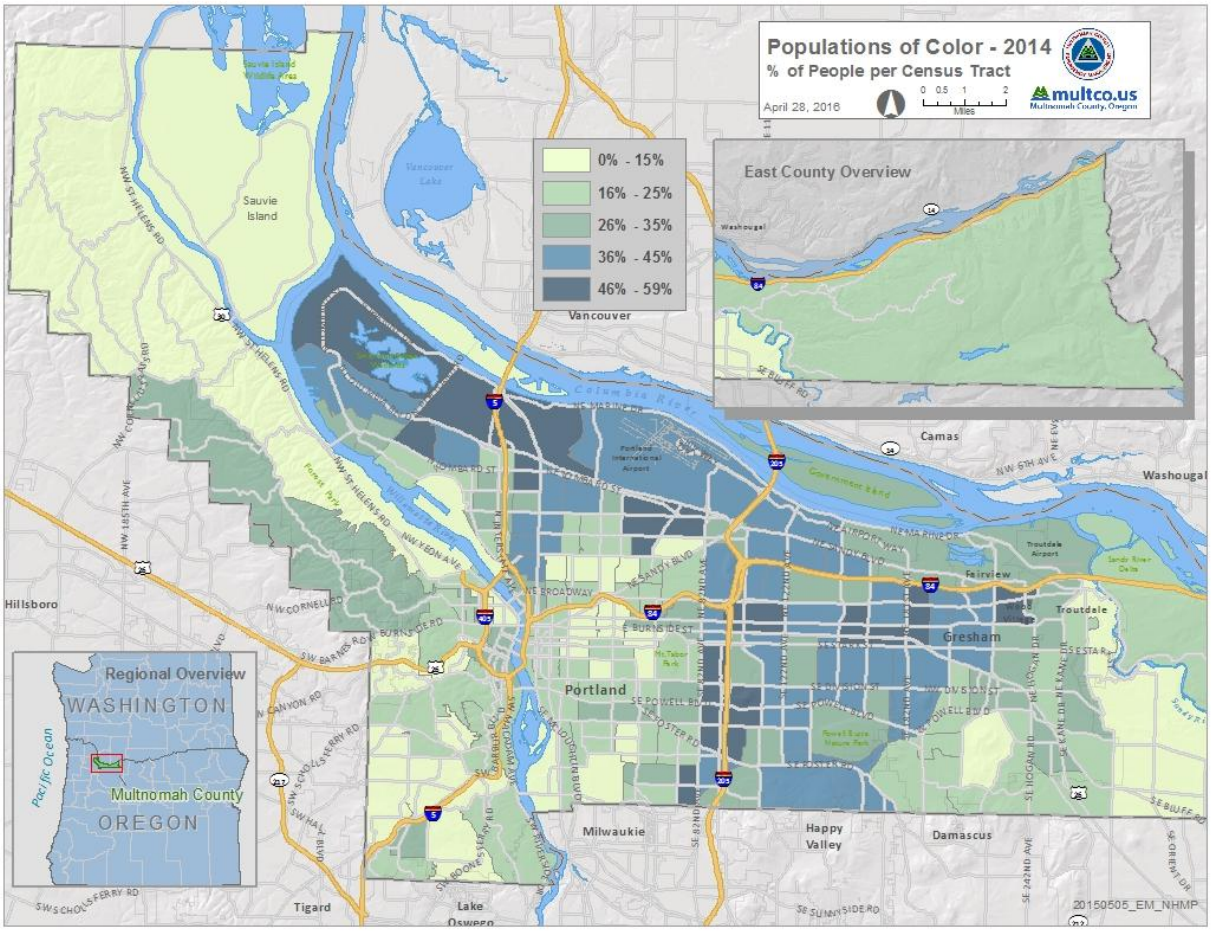
Table 2.2-4: Race and Ethnicity

Community	Race							Ethnicity
	African American	American Indian & Alaskan Native	Asian	Native Hawaiian & Pacific Islander	Other Race	Two or More Races	White	Hispanic or Latino
Oregon	1.8%	1.2%	3.8%	0.4%	3.7%	3.8%	85.2%	11.9%
Multnomah County	5.7%	0.9%	6.8%	0.6%	3.5%	4.3%	78.3%	10.9%
Incorporated	5.8%	0.9%	6.9%	0.6%	3.5%	4.3%	78.0%	11.0%
Fairview	5.8%	2.5%	5.6%	1.9%	0.2%	5.1%	78.8%	17.7%
Gresham	3.6%	1.2%	3.8%	1.1%	6.3%	3.9%	80.1%	19.2%
Maywood Park	12.2%	0.0%	1.2%	0.1%	0.0%	3.5%	83.0%	1.1%
Portland	6.3%	0.8%	7.5%	0.6%	3.1%	4.4%	77.4%	9.4%
Troutdale	2.8%	0.1%	6.0%	0.0%	1.0%	2.8%	87.2%	7.1%
Wood Village	1.6%	1.5%	3.7%	2.1%	8.0%	8.4%	74.8%	34.6%
Unincorporated[1]	0.6%	0.9%	1.6%	0.0%	1.3%	3.2%	92.4%	4.9%
West Hills	1.8%	0.6%	9.7%	0.0%	1.5%	3.0%	83.3%	4.3%
Sauvie Island & West Hills	0.0%	0.0%	0.0%	0.0%	0.0%	14.5%	85.5%	16.4%
West of Sandy River	4.5%	0.7%	0.1%	0.0%	1.0%	0.6%	93.0%	8.5%
East of Sandy River	0.5%	1.7%	3.0%	0.0%	0.5%	7.6%	86.7%	6.4%

Source: U.S. Census Bureau, 2009-2013 American Community Survey 5-Year Estimates

[1] Unincorporated totals are calculated by subtracting incorporated totals from the Multnomah County total. The census tracts representing the unincorporated Rural Planning Areas overlap slightly with incorporated areas and therefore do not equal the unincorporated totals presented in this row.

Figure 2.2-2: Populations of Color

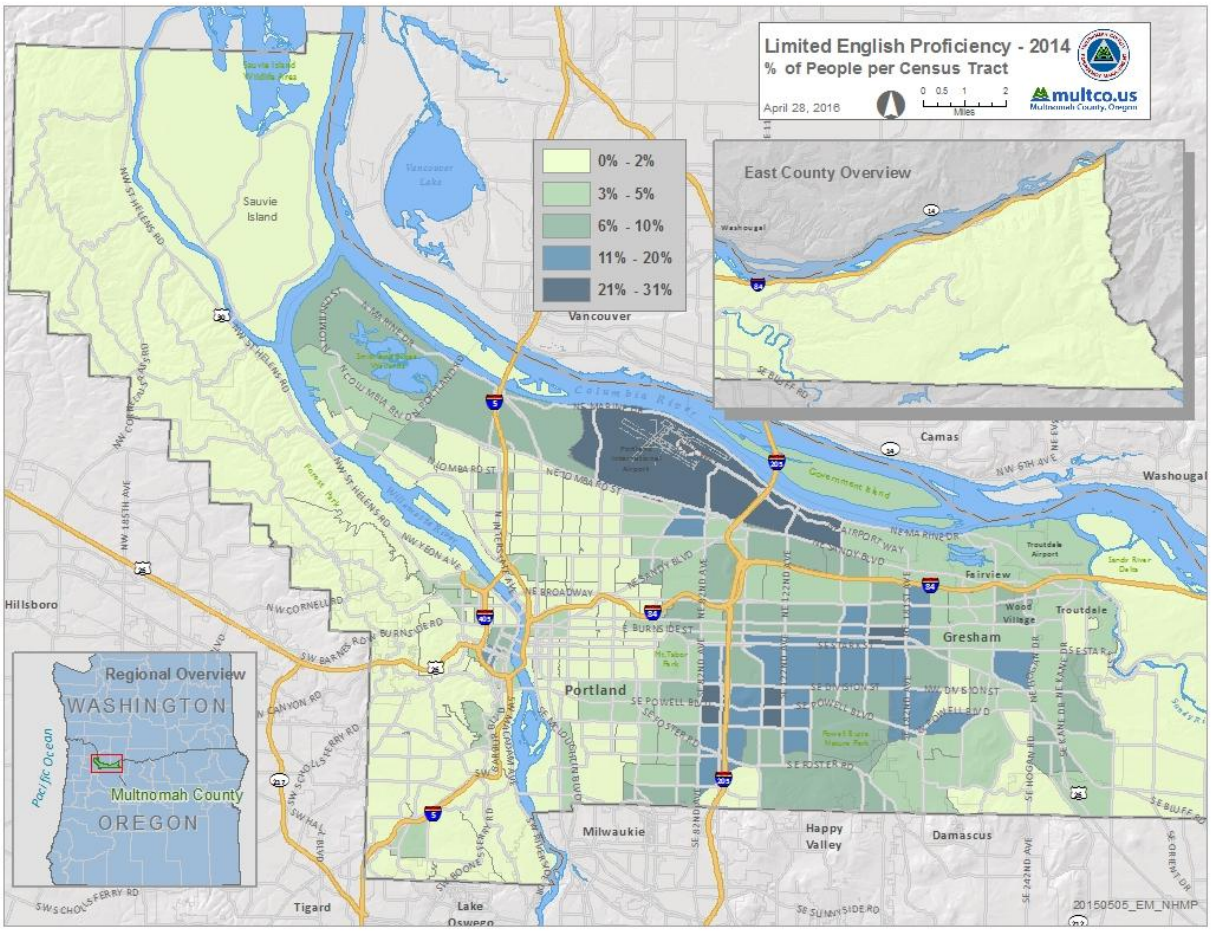


Source: U.S. Census Bureau, 2010-2014 American Community Survey 5-Year Estimates

2.2.9 Language

About 14% of Multnomah County's population, 107,805 people are foreign-born. Many immigrants are not fluent in English, and literacy rates for some groups are low (Flanagan, Gregory, Hallisey, Heitgerd, & Lewis, 2011). There are 66,175 county residents who speak English less than "very well" (U.S. Census Bureau). **Figure 2.2-3** shows the distribution of percentage of people with limited English proficiency per census tract. All but an estimated 342 people who speak English less than "very well" live in the incorporated cities of the county, with a majority living in Portland (50,270) and Gresham (13,391) (U.S. Census Bureau, 2013).

Figure 2.2-3: Limited English Proficiency



Source: U.S. Census Bureau, 2010-2014 American Community Survey 5-Year Estimates

Disaster communication can be difficult for immigrants with limited English proficiency, especially for communities whose first language is neither English nor Spanish and for whom accurate translations of emergency and preparedness messaging may be scarce (Flanagan, Gregory, Hallisey, Heitgerd, & Lewis, 2011). These groups are more likely to rely on relatives and local social networks for information (Flanagan, Gregory, Hallisey, Heitgerd, & Lewis, 2011).

Table 2.2-5 provides a breakdown of the population with limited English proficiency by the language spoken in their home. Of the population 5 years of age and older that speaks English less than "very

well," 40% speak Spanish or Spanish Creole in their homes. Other top languages include Vietnamese (14.6%), Chinese (9.3%), Russian (7.6%), African languages (3.8%), and other Slavic languages (3.4%).

Table 2.2-5: Estimated Population 5 Years and Older Who Speak English Less Than "Very Well" by Language Spoken at Home

Language Spoken at Home*	Multnomah County	Fairview	Gresham	Maywood Park	Portland	Troutdale	Wood Village	West Hills	Sauvie Island & West Hills	West of Sandy River	East of Sandy River
Spanish or Spanish Creole	26,948	587	8,634	4	16,938	267	336	185	0	84	33
Vietnamese	9,660	169	623	0	8,834	80	42	20	0	30	0
Chinese	6,130	13	34	4	5,927	150	0	40	0	0	0
Russian	5,047	0	945	0	3,993	34	38	0	0	0	37
African languages	2,510	0	276	0	2,234	0	0	0	0	0	0
Other Slavic languages	2,248	87	259	0	1,799	85	18	0	0	0	0
Other Indo-European languages	1,872	0	460	0	1,379	33	0	27	0	0	0
Other Asian languages	1,695	0	453	0	1,226	16	0	0	0	0	0
Other Pacific Island languages	1,381	0	515	0	866	0	0	0	0	0	0
Tagalog	893	0	169	0	660	34	0	0	0	8	0
Other Indic languages	891	0	10	0	881	0	0	0	0	0	0
Korean	861	0	68	3	698	14	6	15	0	0	0
Japanese	766	0	20	0	740	0	6	12	0	0	0
Arabic	716	0	213	0	471	0	0	0	0	32	0
Mon-Khmer, Cambodian	597	0	45	0	504	48	0	0	0	0	0
Serbo-Croatian	555	0	35	0	520	0	0	0	0	0	0
Laotian	544	0	21	0	502	21	0	0			0
Hmong	404										0
Other and unspecified languages	287										0
French (incl. Patois, Cajun)	275										0
Thai	271										0
Persian	237										0
German	231										0
Hindi	224										0
Portuguese or Portuguese Creole	170										0
Italian	138										13
Greek	116										0
Hungarian	102										0
Other Native North American languages	96										0
Urdu	84										0
French Creole	73										0

*If there were less than 50 people in the county estimated to speak English less than "very well," the language was not included in this table. (Languages excluded: Armenian, Gujarati, Hebrew, Navajo, Other West Germanic languages, Polish, Scandinavian languages and Yiddish).

Source: U.S. Census Bureau, 2010-2014 American Community Survey 5-Year Estimates

2.2.10 Education

The relationship between education and vulnerability to disaster is not well understood, although education is associated with both income and poverty. People with higher levels of education are more likely to have access to and act upon hazard information (Flanagan, Gregory, Hallisey, Heitgerd, & Lewis, 2011).

In Multnomah County, about 90% of the population over 25 years old are high school graduates or equivalent, and 40% have a bachelor's degree or higher (**Table 2.2-6**). Wood Village, Gresham and Fairview have the highest percentages of residents without a high school degree (25%, 15.8% and 13.2% respectively). In the unincorporated areas of the county, Sauvie Island has the highest percentage of population that did not graduate from high school (11.9%).

Table 2.2-6: Educational Attainment

Community	Population 25 years & over	Not a High school graduate	High school graduate or GED	Some college, no degree	Associate's degree	Bachelor's degree	Graduate or professional degree
Oregon	2,643,833	10.6%	24.6%	26.9%	8.2%	18.7%	11.0%
Multnomah	526,883	10.2%	19.2%	23.6%	7.0%	24.2%	15.7%
Incorporated	514,830	10.4%	6.0%	23.6%	7.0%	24.1%	15.5%
Fairview	6,028	13.2%	26.5%	32.1%	9.7%	14.2%	4.4%
Gresham	68,312	15.8%	28.5%	28.4%	8.5%	13.1%	5.7%
Maywood Park	704	4.4%	17.3%	35.1%	7.7%	22.6%	12.9%
Portland	427,180	9.5%	17.6%	22.5%	6.6%	26.3%	17.5%
Troutdale	10,379	9.0%	25.0%	32.9%	9.8%	18.5%	4.8%
Wood Village	2,227	25.0%	29.7%	26.1%	7.7%	7.7%	3.8%
Unincorporated Planning Areas							
West Hills	5,818	0.5%	6.1%	13.8%	3.4%	41.3%	34.9%
Sauvie Island & West Hills	2,087	5.6%	13.8%	26.9%	6.3%	25.7%	21.7%
West of Sandy River	3,931	5.6%	26.0%	34.3%	7.5%	17.8%	8.8%
East of Sandy River	3,145	7.2%	29.4%	26.5%	10.5%	17.6%	8.7%

Source: U.S. Census Bureau, 2009-2013 American Community Survey 5-Year Estimates

2.2.11 Household Composition

The number of households with children and two parents has decreased in the United States. Single-parent households are usually associated with lower socioeconomic status. Households with lower incomes and only one daily caretaker are especially vulnerable to the economic impacts that follow disaster events (Flanagan, Gregory, Hallisey, Heitgerd, & Lewis, 2011).

Table 2.2-7 shows that 8.3% of households in Multnomah County are single-parent households. The majority of the single-parent households are female-led. Fairview and Wood Village have the highest percentage of female single-parent households (11.6% and 11.4% respectively).

Table 2.2-7: Family Household Composition

Community	Total Households	Family Households with Children	Percent	Single Parent (male)	Percent	Single Parent (female)	Percent
Oregon	1,516,456	414,003	27.3%	36,021	2.4%	94,499	6.2%
Multnomah	305,939	76,197	24.9%	6,274	2.1%	19,122	6.3%
Incorporated	299,769	74,889	25.0%	6,199	2.1%	18,969	6.3%
Fairview	3,815	1,197	31.4%	140	3.7%	441	11.6%
Gresham	38,392	12,739	33.2%	1,059	2.8%	3,637	9.5%
Maywood Park	376	96	25.5%	6	1.6%	9	2.4%
Portland	250,133	58,249	23.3%	4,842	1.9%	14,220	5.7%
Troutdale	5,812	2,073	35.7%	112	1.9%	521	9.0%
Wood Village	1,241	535	43.1%	40	3.2%	141	11.4%
Unincorporated[1]	6,170	1,308	21.2%	75	1.2%	153	2.5%
West Hills	3,883	1,321	34.0%	83	2.1%	66	1.7%
Sauvie Island & West Hills	378	73	19.3%	27	7.1%	0	0.0%
West of Sandy River	2,087	767	36.8%	53	2.5%	87	4.2%
East of Sandy River	1,515	431	28.4%	0	0.0%	133	8.8%

Source: U.S. Census Bureau, 2009-2013 American Community Survey 5-Year Estimates

2.3 Economy

2.3.1 Income

History has shown that people who are economically disadvantaged are disproportionately affected by disasters. People with fewer financial resources are less likely to have the income or assets needed to prepare for or recover from a disaster. For example, people unable to afford homeowner's or renter's insurance are especially vulnerable to property damage and losses incurred from a disaster (Flanagan, Gregory, Hallisey, Heitgerd, & Lewis, 2011). They may also have limited resources to stockpile food, store medications, shelter in place or evacuate.

The median household income in Multnomah County has been slightly higher than for Oregon (**Table 2.3-1**). Accounting for inflation, the county median income decreased between 2010 and 2013. The West Hills area has had the highest median income while the City of Wood Village has had the lowest.

[1] Unincorporated Rural Planning Area totals are calculated by subtracting incorporated totals from the Multnomah County total. The census tracts representing the unincorporated Rural Planning Areas overlap slightly with incorporated areas and therefore do not equal the unincorporated totals presented in this row.

Table 2.3-1: Median Household Income

Community	2010*	2013	Percent Change
Oregon	$52,626	$50,229	-4.6%
Multnomah County	$53,009	$52,511	-0.9%
Fairview	$54,734	$50,897	-7.0%
Gresham	$50,729	$47,417	-6.5%
Maywood Park	$65,181	$68,889	5.7%
Portland	$52,168	$52,657	0.9%
Troutdale	$67,388	$62,326	-7.5%
Wood Village	$50,413	$41,007	-18.7%
Unincorporated Rural Planning Areas			
West Hills	$151,215	$133,775	-11.5%
Sauvie Island & West Hills	$88,230	$72,464	-17.9%
West of Sandy River	$83,003	$71,213	-14.2%
East of Sandy River	$72,591	$66,210	-8.8%

*2010 dollars are adjusted for 2013 using Bureau of Labor Statistics' Consumer Price Index Inflation Calculator.

Source: U.S. Census Bureau, 2006-2010 and 2009-2013 American Community Survey

2.3.2 Poverty

More than one-third of county residents do not have enough income to be able to meet their basic needs[1] (Kristina Smock Consulting, 2014). The number of people in poverty has increased over the past two decades at a rate much higher than the growth in population (Kristina Smock Consulting, 2014). In Multnomah County, 12.8% of all people and 18.5% of all families are estimated to be living below the Federal Poverty Level (**Table 2.3-2**). Wood Village has the highest percentage of families and people living in poverty relative to its population. However, Portland and Gresham have much higher total numbers of families and individuals living in poverty.

The distribution of poverty across the county has shifted eastward, where almost one-quarter of the residents in outer east Portland are at or below the Federal Poverty Level (Kristina Smock Consulting, 2014). The unincorporated areas have fewer persons living in poverty overall. However, the area east of the Sandy River has a higher concentration than the other unincorporated areas (**Figure 2.3-1)**.

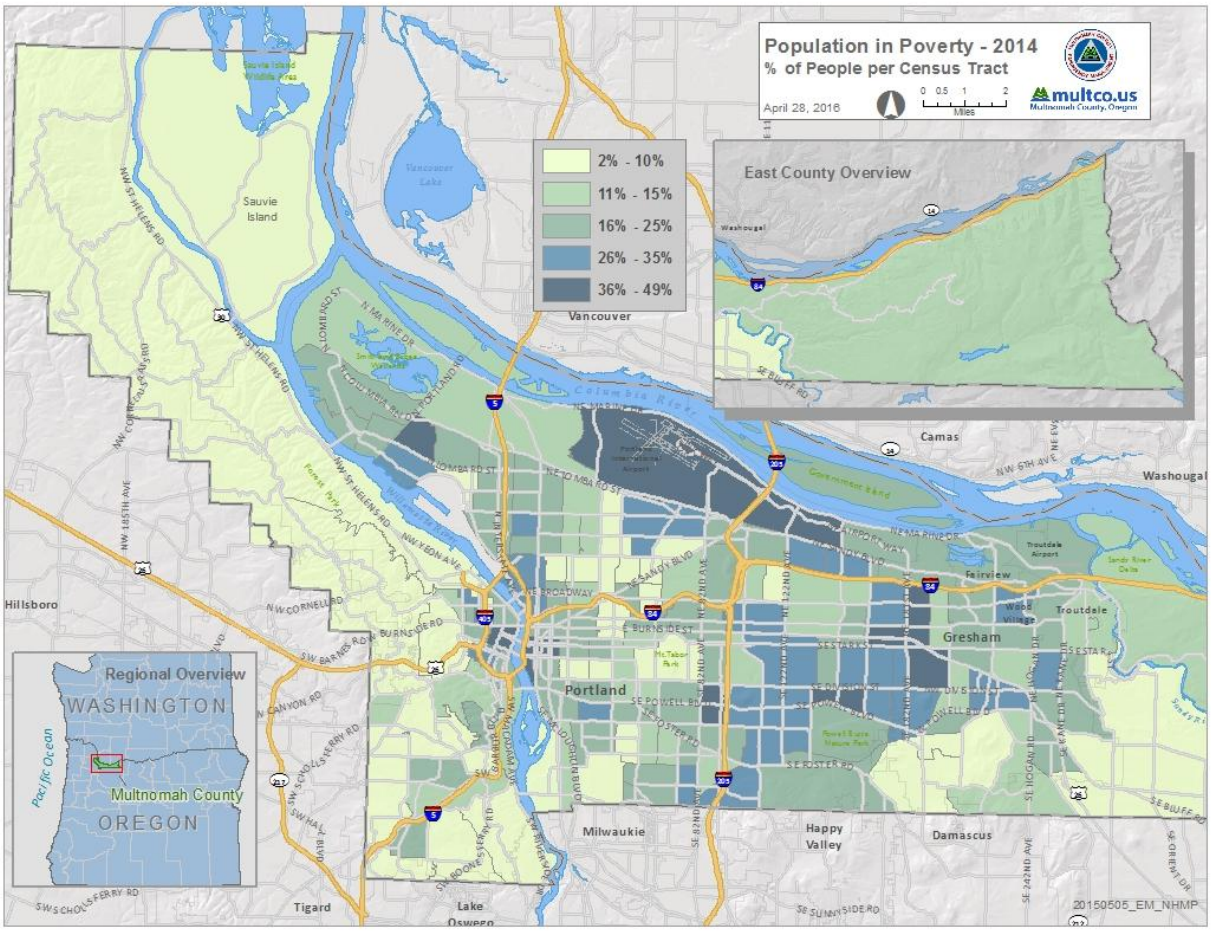
[1] Official measures of poverty (e.g., the U.S. Census Bureau) significantly undercount the number of people who are unable to meet their basic needs. For more information on how poverty is defined, see Multnomah County's 2014 report "Poverty in Multnomah County."

Table 2.3-2: Percentage of Families and People With Income Below the Poverty Level, 2014

Community	All families	Families with female householder, no husband present	All people	Under 18 years	65 years & over
Oregon	11.5%	32.5%	16.7%	22.1%	8.2%
Multnomah	12.8%	32.7%	18.5%	24.9%	10.4%
Fairview	13.8%	45.2%	17.0%	24.0%	3.9%
Gresham	17.7%	39.8%	21.6%	31.5%	8.5%
Maywood Park	2.5%	21.4%	4.8%	8.4%	2.9%
Portland	12.1%	30.7%	18.3%	23.7%	11.4%
Troutdale	10.7%	31.4%	16.4%	21.7%	4.8%
Wood Village	26.3%	72.9%	30.3%	46.5%	5.9%
Unincorporated Planning Areas					
West Hills	4.7%	0.0%	5.1%	6.3%	1.1%
Sauvie Island & West Hills	0.5%	0.0%	5.6%	0.9%	11.4%
West of Sandy River	2.7%	16.5%	6.5%	1.4%	0.0%
East of Sandy River	9.8%	30.0%	14.5%	22.6%	2.9%

Source: U.S. Census Bureau, 2010-2014 American Community Survey 5-Year Estimates

Figure 2.3-1: Poverty



Source: U.S. Census Bureau, 2010-2014 American Community Survey 5-Year Estimates

Communities of color, immigrants and refugees, children, single-parent households, and persons with disabilities are disproportionately impacted by poverty (Kristina Smock Consulting, 2014).

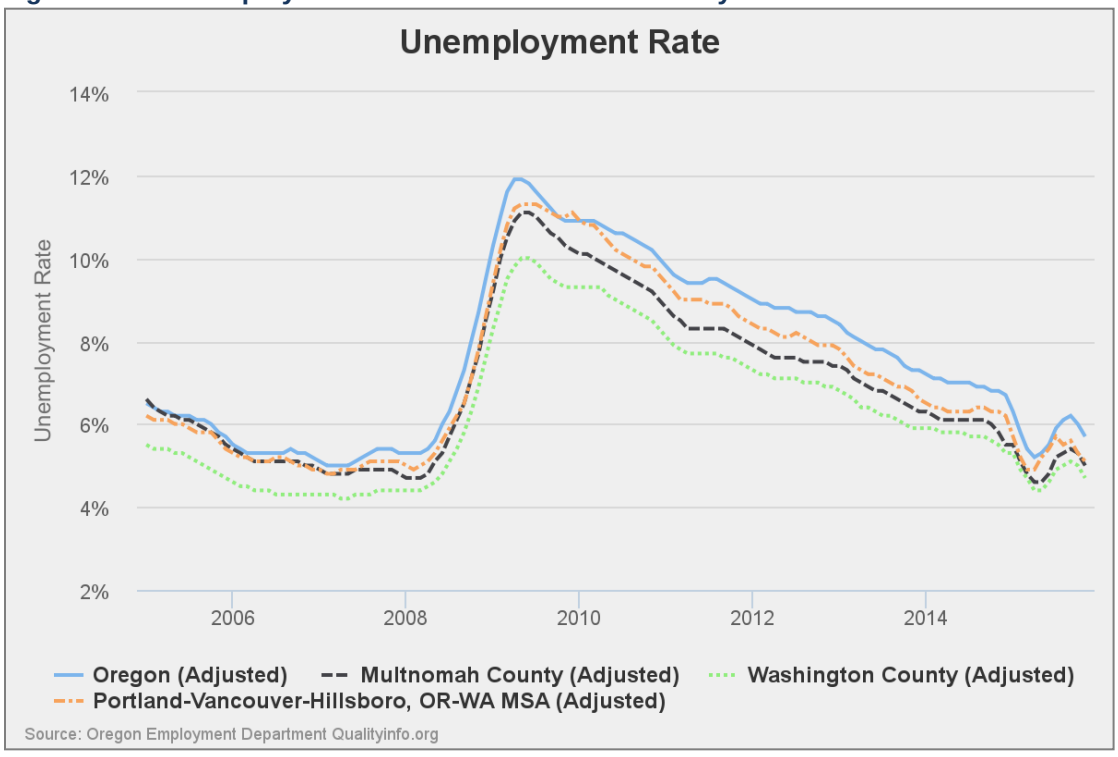
- Communities of color: 44% of the county's population in poverty belong to communities of color, and 26% of individuals in the county's communities of color are in poverty.
- Immigrants and refugees: 19% of the county's population in poverty is foreign born, and 23% of the county's foreign-born population is in poverty.
- Single-parent households: 22% of the county's households in poverty are single-parent households, and 42% of the county's single-parent households are in poverty.
- Women: 53% of the county's population in poverty is female, and 18% of the county's females are in poverty.
- Children: 28% of the county's population in poverty is made up of children under age 18, and 23% of the county's children under age 18 are in poverty.
- Persons with disabilities: 19% of the county's population in poverty have a disability, and 27% of persons with disabilities are in poverty.

Feeding America, a nationwide network of food banks, food pantries and meal programs, defines food insecurity as not always knowing where you will find your next meal. As of July 2015, there were 6,496 families in Multnomah County receiving benefits from the Temporary Assistance for Needy Families (TANF) program and 92,993 households receiving Supplemental Nutritional Assistance Program (SNAP) benefits. Those numbers are 18% lower for TANF and 5% lower for SNAP than in 2014 (Sabatino, 2015). In Multnomah County, 17% of the population is food insecure (Kristina Smock Consulting, 2014). This insecurity could be amplified in the event of a disaster.

2.3.3 Unemployment

Unemployment, like low income, is an indicator of vulnerability. In addition to lower or no income, people who are unemployed may not have employee benefit plans that provide income and health cost assistance to offset the costs of injury or loss resulting from a disaster (Flanagan, Gregory, Hallisey, Heitgerd, & Lewis, 2011). The Oregon Employment Department shows that unemployment rates have been decreasing in Oregon, Multnomah County and the Portland metro area over the past several years (**Figure 2.3-2**). There were 25,468 people unemployed, or 6.1%, in Multnomah County in 2014 (Oregon Employment Department). According to the American Community Survey[1], unemployment rates are highest in the unincorporated area east of Sandy River (18.6%) and in Wood Village (14.1%) (U.S. Census Bureau, 2013).

Figure 2.3-2: Unemployment Rates for Multnomah County and Portland Metro



Source: Oregon Employment Department, 2014

[1] The American Community Survey estimates a higher rate of unemployment for the county at 9.8% in 2014 than the Oregon Employment Department, however, the state's data is not provided at a sub-county level.

2.3.4 Employment Growth and Key Industries

Oregon added 49,500 jobs between October 2014 and September 2015, with more than 39,000 of those in the Portland Metropolitan Statistical Area (MSA) (Seidman, 2015). Employment growth in Multnomah County over the past five years has been led by strong growth in the construction, professional and business services, leisure and hospitality, and information industries (**Table 2.3-4**). In 2014, the trade, transportation and utilities industry had the largest share of the county's workforce, 18.3%. Employment forecasts by industry for Multnomah County project large increases in the construction, professional and business services, and education and health services industries.

Job growth in the Portland MSA has been weighted heavily toward high-wage positions. Nearly 70% of job growth between 2010 and 2014 came from those earning $75,000 or more per year, and 35% came from those earning $100,000 or more (Seidman, 2015). Many of these new jobs are found in the high-tech manufacturing sector, professional and business services, and education and health services (Seidman, 2015). Job growth in Oregon and the Portland MSA is expected to continue; the Oregon Office of Economic Analysis projects a 3.1% annual growth from 2015 to 2017 (Seidman, 2015).

Table 2.3-4: Employment by Industry, 2014, and Forecasted Growth

Industry	Multnomah County, 2014				Percent Change in Employment (2010-2014)	Employment Forecast* (2012-2022)
	Firms	Employees	Percent Workforce	Average Pay		
Total Payroll Employment	30,751	465,696	100%	$51,741	10.5%	16%
Total Private	30,083	393,804	84.6%	$50,323	12.3%	17%
Natural Resources & Mining	81	1,745	0.4%	$36,369	0.9%	14%
Construction	1,770	20,113	4.3%	$66,303	28.7%	29%
Manufacturing	1,223	34,008	7.3%	$53,555	8.4%	9%
Trade, Transportation & Utilities	5,794	85,030	18.3%	$42,705	8.4%	12%
Information	788	10,639	2.3%	$73,104	11.9%	12%
Finance Activities	2,706	28,109	6.0%	$72,277	2.0%	12%
Professional & Business Services	6,211	74,151	15.9%	$68,054	21.0%	24%
Education & Health Services	3,584	67,439	14.5%	$48,493	10.1%	24%
Leisure & Hospitality	3,270	52,813	11.3%	$22,458	16.0%	17%
Other Services	4,606	19,724	4.2%	$33,191	9.1%	16%
Unclassified	46	27	0.0%	$39,452	-79.5%	-
Total Government	667	71,892	15.4%	$59,507	1.4%	10%
Federal	100	12,196	2.6%	$76,779	-2.1%	-5%
State	101	11,424	2.5%	$43,527	9.0%	11%
Local	465	48,271	10.4%	$58,926	0.6%	13%

* Employment forecast is for the Portland metro region including Multnomah and Washington counties.

Source: Oregon Employment Department, "2010 and 2014 Covered Employment and Wages Summary Reports" and "Regional Employment Projections by Industry & Occupation 2012-2022"

2.4 Housing

2.4.1 Housing Type

Housing type and quality are important factors in determining disaster vulnerability. A majority of Multnomah County's housing is single-family structures (**Table 2.4-1**), particularly in the unincorporated areas. Fairview, Portland and Gresham have the highest percent of multi-family housing. A study of the 1994 earthquake in Northridge, California, found that persons living in multi-family structures were more likely to have been injured than those in single-family homes (Centers for Disaster Control, no date). People living in large multi-family buildings are vulnerable to overcrowding in limited exit stairwells. This type of dense housing can result in large numbers of people exiting into the street, making safe evacuation more difficult (Flanagan, Gregory, Hallisey, Heitgerd, & Lewis, 2011). Populations living in group quarters pose another concern for evacuation. In Multnomah County, there are an estimated 18,076 persons living in group quarter facilities, including correctional facilities, nursing facilities and college/university housing (U.S. Census Bureau).

Mobile homes are considered a vulnerable housing type because they are not designed to withstand severe weather, such as high winds or flooding, and are more likely to shift off of their foundations during earthquakes (Flanagan, Gregory, Hallisey, Heitgerd, & Lewis, 2011; State of Oregon, 2015). **Table 2.4-1** shows that mobile homes make up a small percentage of the county's housing stock, with the largest percentages found in Wood Village (27.9%) and East of Sandy River (18.6%).

Table 2.4-1: Housing Type

Community	Total Housing Units	Single-Family		Multi-Family		Mobile Homes	
		Number	% of Total	Number	% of Total	Number	% of Total
Oregon	1,677,363	1,144,051	68.1%	389,356	27.5%	139,379	8.3%
Multnomah	325,163	197,461	60.7%	120,428	37.0%	6,734	2.1%
Incorporated	318,362	191,573	60.2%	120,012	37.7%	6,313	2.0%
Fairview	4,024	2,105	52.3%	1,567	38.9%	338	8.4%
Gresham	40,030	23,388	58.4%	15,193	38.0%	1,411	3.5%
Maywood Park	376	351	93.4%	25	6.6%	0	0.0%
Portland	266,581	160,601	60.2%	101,562	38.1%	4,006	1.5%
Troutdale	6,083	4,474	73.5%	1,405	23.1%	204	3.4%
Wood Village	1,268	654	51.6%	260	20.5%	354	27.9%
Unincorporated[1]	6,801	5,888	86.6%	416	6.1%	421	6.2%
West Hills	3,283	3,065	93.4%	218	6.6%	0	0.0%
Sauvie Island & West Hills	1,250	1,080	86.4%	0	0.0%	111	8.9%
West of Sandy River	2,176	2,105	96.7%	54	2.5%	0	0.0%
East of Sandy River	1,614	1,242	77.0%	72	4.5%	300	18.6%

Source: U.S. Census Bureau, Census 2009-2013 American Community Survey 5-Year Estimates

[1] Unincorporated totals are calculated by subtracting incorporated totals from the Multnomah County total. The census tracts representing the unincorporated Rural Planning Areas overlap slightly with incorporated areas and therefore do not equal the unincorporated totals presented in this row.

The overall quality of housing is difficult to measure but is closely tied to personal wealth. Low-income households are more likely to live in substandard housing or mobile homes, which are more vulnerable to hazards (Flanagan, Gregory, Hallisey, Heitgerd, & Lewis, 2011). In Multnomah County, there is a deficit of 21,910 housing units affordable to the lowest income renters (Kristina Smock Consulting, 2014). The American Housing Survey (2011) found that the rate of severe and moderate physical problems with housing in the Portland metropolitan area was lower than national rates.

2.4.2 Housing Age

The age of a structure is a good indicator of its ability to withstand certain hazards. In general, most homes built after the mid 1990s are expected to be more resilient due to higher building standards related to hazards. Seismic building standards were first introduced in the Oregon building code in 1974. More rigorous standards were passed in 1995 that required designs that would accommodate shaking from a Cascadia Subduction Zone earthquake, almost doubling the earthquake forces used in earlier codes. This means that the majority of buildings in Oregon have not been designed to resist the shaking from a magnitude 9.0 Cascadia earthquake (OSSPAC, 2013). See **3.1 Earthquake** for more details on seismic risk.

Flood maps and standards to regulate building in floodplains were introduced in Multnomah County between 1979 and 1988. **Table 2.4-2** shows that approximately 23.4% of the housing stock in Multnomah County was built after 1990. See **3.2 Flood** for more details on flood risk.

Table 2.4-2: Housing Age

Community	Total Housing Units	Pre 1970		1970 to 1989		1990 or later	
		Number	Percent of Total	Number	Percent of Total	Number	Percent of Total
Oregon	1,677,363	603,869	36.0%	519,154	31.0%	554,340	33.0%
Multnomah	325,163	180,189	55.4%	68,944	21.2%	76,030	23.4%
Incorporated	318,362	177,118	55.6%	66,539	20.9%	74,705	23.5%
Fairview	4,024	386	9.6%	841	20.9%	2,797	69.5%
Gresham	40,030	8,762	21.9%	17,419	43.5%	13,849	34.6%
Maywood Park	376	360	95.7%	6	1.6%	10	2.7%
Portland	266,581	166,695	62.5%	45,520	17.1%	54,366	20.4%
Troutdale	6,083	576	9.5%	2,172	35.7%	3,335	54.8%
Wood Village	1,268	339	26.7%	581	45.8%	348	27.4%
Unincorporated[1]	6,801	3,071	45.2%	2,405	35.4%	1,325	19.5%
West Hills	3,283	508	15.5%	212	6.5%	2,563	78.1%
Sauvie Island & West Hills	1,250	463	37.0%	401	32.1%	386	30.9%
West of Sandy River	2,176	659	30.3%	524	24.1%	993	45.6%
East of Sandy River	1,614	666	41.3%	648	40.1%	300	18.6%

Source: U.S. Census Bureau, Census 2008-2013 American Community Survey 5-Year Estimates

[1] Unincorporated totals are calculated by subtracting incorporated totals from the Multnomah County total. The census tracts representing the unincorporated Rural Planning Areas overlap slightly with incorporated areas and therefore do not equal the unincorporated totals presented in this row.

2.4.3 Housing Tenure

Housing tenure is often closely related to household income and quality of housing. Much of the damage resulting from the 1994 Northridge earthquake in Southern California involved low and moderate income rental housing units that were older (Insurance Institute for Business and Home Safety, no date). Renters have less control over mitigating risks because they typically cannot make improvements to the structure, and are less likely to have insurance or personal financial resources to assist with recovery (State of Oregon, 2015). As witnessed after the 1987 Whittier-Narrows earthquake in California, low-income tenants may find it difficult to return to the same home or neighborhood after a disaster (Insurance Institute for Business and Home Safety). **Table 2.4-3** shows that 45.8% of occupied housing units in Multnomah County are renter-occupied. The percent of rental units is much higher in the incorporated areas (46.5%) than it is in the unincorporated areas (15.5%). **Figure 2.4-1** shows patterns of greater percentages of home ownership northwest and southwest of downtown Portland, in the City of Fairview and parts of Troutdale, in southeast County and in unincorporated areas. Greater percentages of renter housing, shown in **Figure 2.4-2**, are in downtown Portland**,** north Portland, inner northeast and southeast Portland, areas east of Interstate 205, and most of Gresham and Wood Village

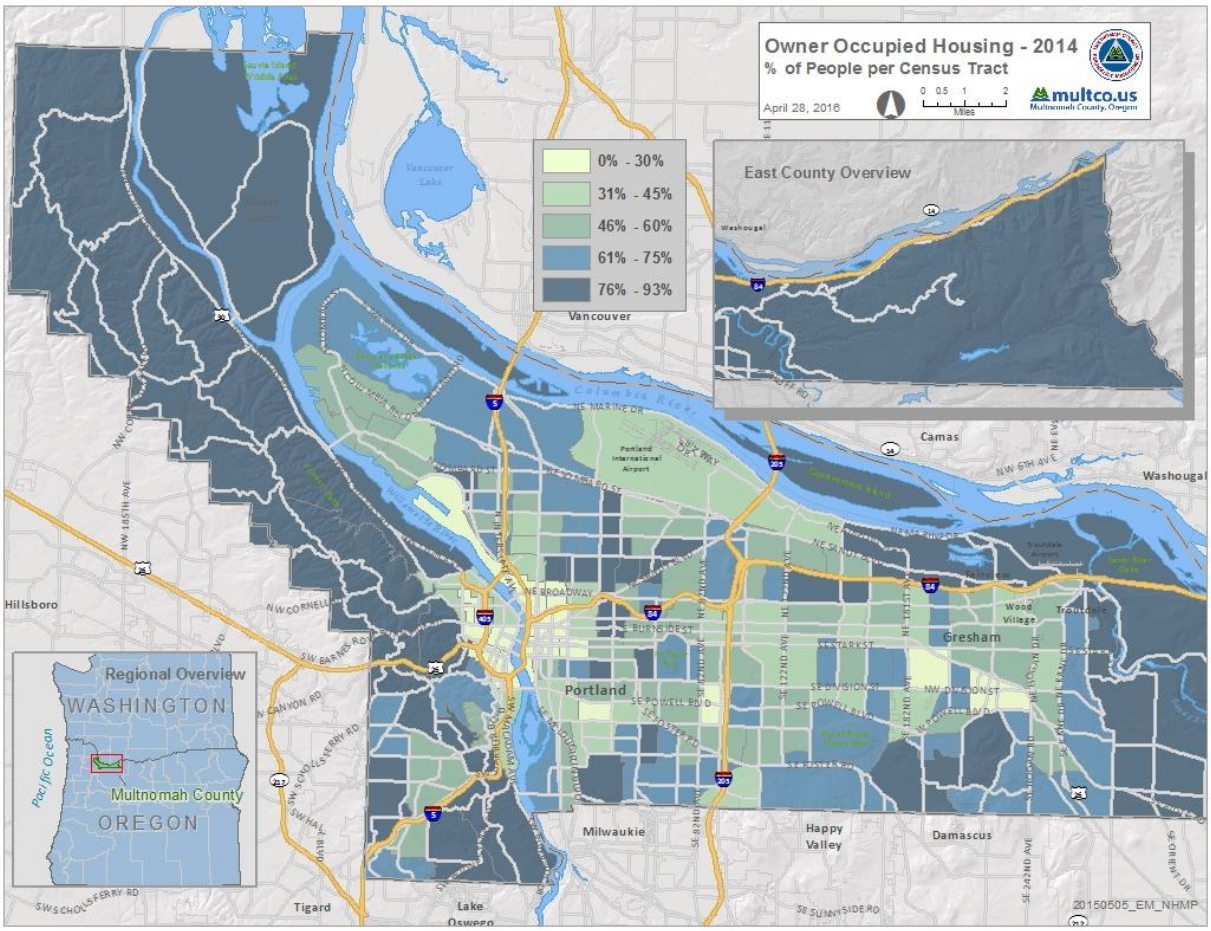
Table 2.4-3: Housing Occupancy and Tenure

Community	Occupied Units	Owner-occupied		Renter-occupied	
		Estimate	Percent	Estimate	Percent
Oregon	1,516,456	940,143	62.0%	576,313	38.0%
Multnomah	305,939	165,713	54.2%	140,226	45.8%
Incorporated	299,769	160,498	53.5%	139,271	46.5%
Fairview	3,815	1,981	51.9%	1,834	48.1%
Gresham	38,392	20,146	52.5%	18,246	47.5%
Maywood Park	376	323	85.9%	53	14.1%
Portland (part)	250,133	133,467	53.4%	116,666	46.6%
Troutdale	5,812	3,838	66.0%	1,974	34.0%
Wood Village	1,241	743	59.9%	498	40.1%
Unincorporated[1]	6,170	5,215	84.5%	955	15.5%
West Hills	3,104	2,648	85.3%	456	14.7%
Sauvie Island & West Hills	1,157	1,005	86.9%	152	13.1%
West of Sandy River	2,087	1,655	79.3%	432	20.7%
East of Sandy River	1,515	1,191	78.6%	324	21.4%

Source: U.S. Census Bureau, Census 2008-2013 American Community Survey 5-Year Estimates

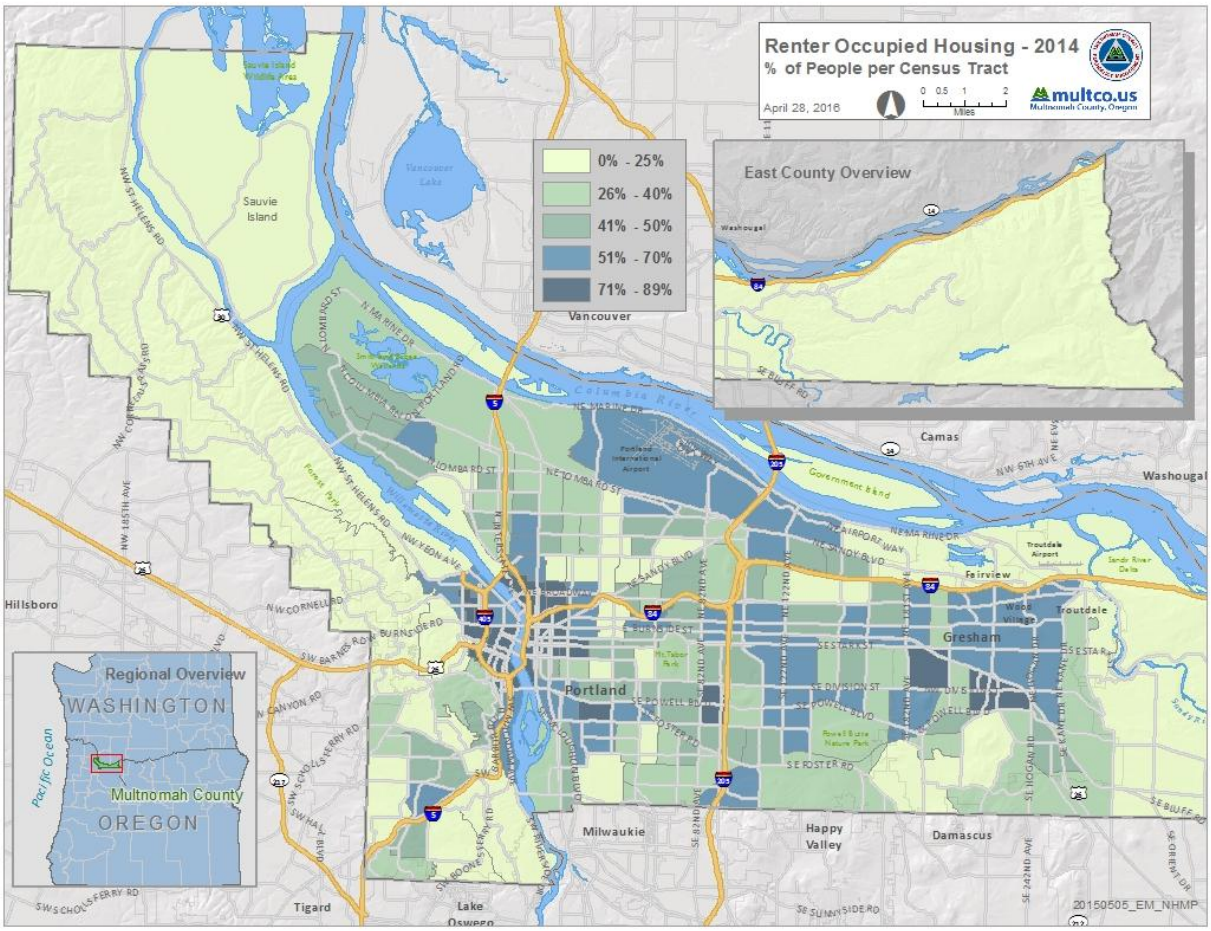
[1] Unincorporated totals are calculated by subtracting incorporated totals from the Multnomah County total. The census tracts representing the unincorporated Rural Planning Areas overlap slightly with incorporated areas and therefore do not equal the unincorporated totals presented in this row.

Figure 2.4-1: Owner Occupied Housing



Source: U.S. Census Bureau, 2010-2014 American Community Survey 5-Year Estimates

Figure 2.4-2: Renter Occupied Housing



Source: U.S. Census Bureau, 2010-2014 American Community Survey 5-Year Estimates

2.5 Transportation

2.5.1 Roads

Multnomah County is served by an extensive network of interstate highways, state highways, and local roads and streets. The major interstates include I-5, which runs north-south through the county and is the major route connecting Oregon with Washington and California. I-84 is the major route from Multnomah County eastward to Idaho, other Rocky Mountain states, and the central and eastern United States. I-205 is a bypass highway east of Portland that connects with I-5 south of Portland in Clackamas County and north of Portland in Washington State. I-405 is a short bypass highway off I-5 that connects to State Highway 26.

Major state highways include Highway 26, which runs east-west, connecting the county to central and eastern Oregon (east) and the Oregon Coast (west). Highway 30 connects Multnomah County to Columbia County on the northwest and runs eastward generally parallel to I-84. Highway 99 runs north-south from I-5 near the Columbia River south to Clackamas County near Milwaukie. NW Cornelius Pass Road, which connects Highway 26 and Highway 30 through the West Hills, is an important commuter route. Burnside Street is another major corridor that runs east-west across the county.

Key transportation system elements for each community in the Planning Area are shown in **Table 2.5-1.**

Table 2.5-1: Key Transportation System Elements

Multnomah County	Fairview	Gresham	Troutdale	Wood Village
I-84	I-84, including the off ramp to Fairview Parkway	I-84, including on-off ramp to NE 181st	I-84, including on-off ramps at NE 238th Drive	I-84, including on-off ramps at NE 238th Drive
I-5	223rd Avenue	181st Avenue/182nd Avenue	Marine Drive	238th Drive
I-45	Fairview Parkway, a.k.a. 207th Avenue	US Highway 26, a.k.a. Powell Boulevard	Columbia River Highway	NE Glisan Street
State Highway 26	Glisan Street	Division Street	257th Avenue	NE Halsey Street
State Highway 30	Halsey Street	Burnside Street	Stark Street	NE Arata Road
Historical Columbia Gorge Highway	Sandy Boulevard	Hogan Road	Cherry Park Road	NE Sandy Boulevard
NW Cornelius Pass Road	Marine Drive	Kane Road, a.k.a. 257th Avenue	Buxton Road	
	Fairview Lake Road	Eastman Parkway, a.k.a 223rd Avenue Stark Street Glisan Street Halsey Street Pleasant View Drive, a.k.a. 190th	Troutdale Road	

Source: Natural Hazards Mitigation Plan Steering Committee

2.5.2 Bridges

The landscape across Multnomah County is defined by rivers and the bridges that span them. Our residents, workers and those who travel through our communities depend on safe, convenient river crossings for their daily lives and livelihood. Many bridges also carry critical services, including water distribution pipes, telecommunications and electrical lines across the Willamette River. If bridges are damaged, these lines could break and disrupt service to parts of the city.

There are 504 bridges within the county, including:

- 333 state highway bridges
- 44 county highway bridges
- 126 municipal bridges
- 1 historic covered bridge

In 2015, Multnomah County published a 20-year Willamette River Bridges Capital Improvement Plan (Bridge CIP) that focused on maintaining and seismically retrofitting the county's six bridges that span the Willamette River: Broadway, Burnside, Hawthorne, Morrison, Sauvie Island and Sellwood. These bridges connect the community and currently serve approximately 200,000 people daily. According to the Bridge CIP, the county's four historic movable bridges — Hawthorne, Broadway, Burnside, and Morrison — lack the necessary seismic resiliency to withstand moderate to major earthquakes. Three steps were taken to address seismic resiliency within the Bridge CIP (Multnomah County, 2015):

- Step 1: A review of prior seismic retrofit projects constructed by Multnomah County determined that the only seismic retrofit work constructed for any of the Willamette River bridges was a partial Phase 1 retrofit on the Burnside Bridge.

- Step 2: The development of seismic performance criteria, including:
  - Burnside Bridge: This bridge should remain fully operational to vehicles and river traffic following a Magnitude 9.0 Cascadia Subduction Zone earthquake.
  - Broadway, Morrison and Hawthorne bridges: The bridge superstructure, defined as its longitudinal spans, should not collapse due to small (Magnitude 4 +/-) earthquakes.

- Step 3: Develop Seismic Resiliency Project Bundles for each of the bridges.

The Bridge CIP identified the following 20-year Bridge Seismic Resiliency Plan for the four movable bridges in downtown Portland: "Within the next 20 years, the Burnside Bridge, as a designated regional lifeline route, should receive a major seismic upgrade in the form of either a Phase I and II seismic retrofit or bridge replacement. The other three downtown movable bridges should receive a Phase I retrofit. Beyond the 20-year CIP horizon, the county may choose to augment the Phase I retrofits with Phase II seismic retrofits for these three bridges at an estimated cost of $1.36 billion, assuming construction in the 2040–2044 time interval" (Multnomah County, 2015).

Two new bridges — the Sauvie Island Bridge (2008) and the Sellwood Bridge (2016) — are constructed to current seismic standards. For more information on bridge infrastructure and a map of county-maintained bridges, see **Annex I: Human-Caused and Technological Hazard Identification and Risk Assessment.**

2.5.3 Public Transportation

A regional transit system (Tri-Met) provides both bus and light rail service through the greater Portland metropolitan area. The light rail system (MAX) provides mass transportation connecting downtown Portland with Gresham to the east and Hillsboro to the west (in Washington County). The small cities in the county are relatively well-connected to employment centers in downtown Portland via light rail and bus, though travel time can be a disincentive. Buses and light rail service can be disrupted by natural hazards such as winter storms, flooding, landslides and earthquakes.

Residents living in the rural areas outside the Tri-Met service area rely on automobiles and state and county roads.

2.5.4 Alternative Transportation

Alternative transportation involves the use of many different modes of transportation, such as walking, biking, taking public transportation and carpooling. All of these transportation modes support active living, save money and reduce traffic congestion. Multnomah County is part of the tri-county region, which has an extensive focus on alternative transportation modes. The region has earned a national and global reputation as a walking- and biking-friendly community.

In Multnomah County, one of the popular paths for alternative transportation is the Springwater Trail Corridor. It runs from Portland through Gresham to Boring. This 40-mile loop trail system extends across the region.

All modes of public transportation are subject to impacts from natural hazard events.

2.5.5 Rail

Passenger rail service to/from Portland is operated by Amtrak, which operates three routes through Portland:

- Amtrak Cascades between Vancouver, British Columbia, and Eugene, Oregon
- Coast Starlight between Seattle, Portland and Los Angeles
- Empire Builder between Portland and Chicago

Freight rail service in Multnomah County is provided by two long-haul railroads: Burlington Northern and Santa Fe (BNSF) and Union Pacific (UP). BNSF provides service north to Seattle, south to California and east via Spokane, Washington. UP provides service south to California and east via Boise, Idaho. In addition, there are two short-line railroads serving Multnomah County. Portland & Western provides service from Astoria, Oregon, to Portland, and the Portland Terminal Railroad provides connections from Portland's marine terminals to other carriers.

2.5.6 Marine, Riverine, Air

Marine and air transport to/from Multnomah County is provided by facilities operated by the Port of Portland (Port). The Port operates four marine terminals that provide service via ocean-going ships and barges, including:

- One terminal on the Columbia River
- Three terminals on the Willamette River near the confluence with the Columbia River

The Port also operates the Portland International Airport (PDX), the main commercial airport for northwest Oregon and vicinity. The Port also operates three much smaller commercial airports, including Troutdale Airport in Multnomah County, Hillsboro Airport in Washington County and Mulino Airport in Clackamas County. The Port owns and operates the dredge Oregon to help maintain the shipping channel on the lower Columbia River. The Port oversees five industrial/business parks and is the Portland area's largest owner of industrial land.

2.5.7 Access to Transportation

Limited access to vehicles and public transit has implications on the everyday movement of people and things, as well as during an emergency evacuation. The rate of vehicle access is higher in the unincorporated Rural Planning Areas than in the cities (**Table 2.5-1**). The overall cost of car ownership, such as purchase price, maintenance, insurance and fuel costs, can limit the ability of people to own vehicles (Flanagan, Gregory, Hallisey, Heitgerd, & Lewis, 2011). In the Portland metro area, like in many communities, people of color, women, and people with limited incomes or mobility rely disproportionately on public transit (Metro, 2015). However, public transit access is limited in some of the areas east of I-205 that have high percentages of populations of color and low-income (Kristina Smock Consulting, 2014).

Table 2.5-1: Vehicles Available

Community	Occupied Housing Units	No. Vehicles Available	Percent of Households
Oregon	1,522,988	121,892	8.0%
Multnomah	308,595	42,673	13.8%
Incorporated	302,044	42,572	14.1%
Fairview	3,856	362	9.4%
Gresham	38,556	3,932	10.2%
Maywood Park	369	19	5.1%
Portland	252,185	37,882	15.0%
Troutdale	5,784	263	4.5%
Wood Village	1,294	114	8.8%
Unincorporated[1]	6,551	101	1.5%
West Hills	3,114	47	1.5%
Sauvie Island & West Hills	1,136	54	4.8%
West of Sandy River	2,191	23	1.0%
East of Sandy River	1,551	31	2.0%

Source: U.S. Census Bureau, 2010-2014 American Community Survey 5-Year Estimates

2.6 Utilities

2.6.1 Water

Potable Water

Surface sources for drinking water are vulnerable to pollutants caused by non-point sources and natural hazards. Non-point source pollution may include stormwater runoff from roadways, agricultural operations, timber harvest, erosion and sedimentation. Landslides, flood events, and earthquakes and resulting liquefaction can cause increased erosion and sedimentation in waterways (DLCD, 2015).

Underground water supplies and aging or outdated infrastructure such as reservoirs, treatment facilities, and pump stations can be severed during a seismic event. These types of infrastructure damages could result in a loss of water pressure in municipal water supply systems, thus limiting access to drinking water. Lack of clean drinking water can threaten human health and impact industry (DLCD, 2015).

The communities in this plan rely on both surface water and groundwater for potable water. The following public water agencies supply our drinking water:

- Burlington Water District
- Corbett Water District
- Lusted Water District
- Plainview Water District
- Pleasant Home Water District
- Portland Water Bureau

[1] Unincorporated totals are calculated by subtracting incorporated totals from the Multnomah County total. The census tracts representing the unincorporated Rural Planning Areas overlap slightly with incorporated areas and therefore do not equal the unincorporated totals presented in this row.

- Rockwood Water People's Utility District
- Springdale Water District
- West Slope Water District

The most critical components in potable water systems are raw water sources, pumping plants, treatment plants and transmission mains. Local distribution systems, while important, are less important than the critical components listed above because damage to distributions systems results in outages to fewer customers and is often easier and quicker to repair than damage to critical components.

Stormwater and Wastewater

Stormwater and wastewater systems are vulnerable to severe precipitation events that cause flooding and lead to stormwater runoff. A non-point source of water pollution, stormwater runoff can adversely impact drinking water quality and habitat health. Large volumes of fast-moving stormwater that enter surface waterways can cause erosion. Leaves and other debris can be carried into storm drains and pipes, which can clog stormwater systems. In areas where stormwater systems are combined with wastewater systems (combined sewers), flooding events can lead to combined sewer overflows (CSOs). CSOs present a heightened health threat as sewage can flood urban areas and waterways. Underground stormwater and wastewater pipes also are vulnerable to damage by seismic events.

Stormwater Systems

As part of the state and federal requirements, local jurisdictions are generally required to have stormwater management plans. Multnomah County has a 2010 Stormwater Management Plan (updated in 2011). The plan includes several urban pocket areas; the unincorporated area of Interlachen; and the roadways in Fairview, Troutdale and Wood Village (approximately 28 miles). The City of Gresham has a 2011 Stormwater Management Plan. The City of Fairview has a 2011 Stormwater Management Plan. The City of Troutdale has a 2007 Stormwater Management Plan. In 2007, the City of Wood Village was directed by the state to create a stormwater management plan (DEQ, 2007).

Drainage Districts

The Multnomah County Drainage District No. 1 (MCDD) provides flood protection for people, property and the environment within a 25-square-mile managed floodplain along the Columbia River in northeast Portland, Gresham and Fairview. MCCD also manages and controls three other drainage districts in the managed floodplain: Peninsula Drainage District #1 (PEN1), Peninsula Drainage District #2 (PEN2), and the Sandy Drainage Improvement Company (SDIC). The Portland International Airport (PDX), the Troutdale Airport, and Marine Terminals 2, 4, 5 and 6 are located within this consortium of floodplain districts (part of the Columbia River Basin).

The SDIC manages the levee and canal system on the southern half of Sauvie Island. It is surrounded by the Columbia and Willamette rivers, the Multnomah Channel and Sturgeon Lake. The levee protects 11,200 acres from flooding. It is approximately 18 miles long and divided into four segments. The elevation of the levee ranges from 33 to 36 feet.

Wastewater Systems

Except for the cities of Gresham and Troutdale, the majority of wastewater collection and treatment for the communities in the Planning Area is provided by the City of Portland's Bureau of Environmental Services (BES). The City of Gresham's Department of Environmental Services treats wastewater for Gresham, Fairview and Wood Village. A number of moorages provide wastewater collection and

treatment for floating homes. In rural areas, many residents rely on individual septic systems. Maintenance of individual septic systems is the responsibility of the respective property owner. The most critical components for wastewater systems are the treatment plants, large pump stations and large diameter collection pipes.

2.6.2 Energy

Our energy sources include electricity, natural gas, diesel, gasoline, and other sources such as light fuel oil, green electricity, propane, ethanol, heavy fuel oil and biodiesel (Portland Bureau of Emergency Management [PBEM], 2012). The primary energy sources described below are electric, petroleum and natural gas, and hydropower. Petroleum and natural gas share similarities in methods of extraction, fuel cycles and transport, but the facilities and commodities are regulated separately and have multiple stakeholders and trade associations. Energy assets and critical infrastructure components are owned by private, federal, state and local entities, and by some energy consumers, such as large industries and financial institutions, often for backup power purposes (Oregon Department of Energy [ODOE] and Oregon Public Utilities Commission [PUC], 2015).

Maps showing the locations of several types of pipeline infrastructure, including gas transmission lines, hazardous liquid lines, liquefied natural gas (LNG) plants and breakout tanks, can be found in **Annex I: Human-Caused and Technological Hazard Identification and Risk Assessment (HIRA) Figures 1, 2, 3,** and **4**. Potential failures and impacts to these systems are also analyzed in the HIRA.

Electric

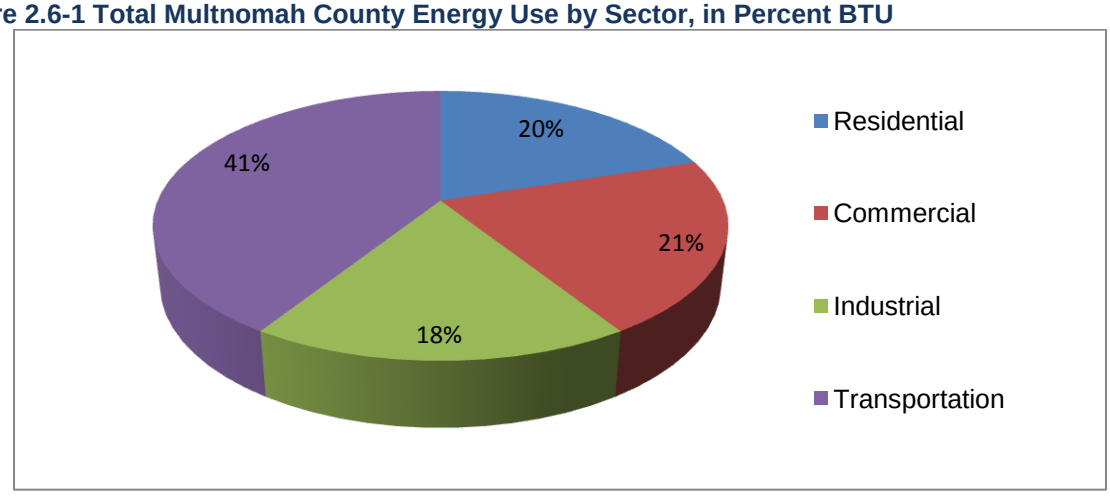
Electric power is provided by Portland General Electric (PGE) and PacifiCorp (Pacific Power), both of which are private, investor-owned utilities. Wholesale power to both PGE and Pacific Power is provided by the Bonneville Power Administration, a federal agency. PGE is the largest investor-owned utility in the region, serving large areas of Clackamas, Multnomah, and Washington counties (DLCD, 2015). Pacific Power is another investor-owned utility company serving a small portion of Multnomah County (Oregon Office of Emergency Management [OEM], 2015). Much of the Portland Urban Area's (PUA) electrical power supply is managed by the Bonneville Power Administration's control center located in the PUA (PBEM, 2012).

For electric power utilities, the most critical components are generation facilities (hydroelectric dams, fossil fuel power plants and others), transmission lines and high voltage substations. Local distribution systems — including distribution lines and low-voltage substations — while important are less important than the major components.

The Northern Willamette Valley/Portland metro area has eight power-generating facilities, six of which are hydroelectric and two natural gas. In total, these facilities have the ability to produce up to 1,121 megawatts (MW) of electricity (DLCD, 2015). Though none of these facilities is located within Multnomah County, communities in the Planning Area rely on them for everyday activities and to support the local economy.

In 2014, Multnomah County (all cities and unincorporated areas) used a total of 102,120,348 British Thermal Units (BTU) (Portland Bureau of Planning & Sustainability, personal communication, April 29, 2016). **Figure 2.6-1** shows the transportation sector as the highest energy user, at 41 percent of the total BTUs. With a combined total of 41 percent of the BTUs, the residential and commercial sectors together used the same amount of energy as the transportation sector. The fourth category is the industrial sector, which used 18 percent of the BTUs.

Figure 2.6-1 Total Multnomah County Energy Use by Sector, in Percent BTU



Source: Portland Bureau of Planning & Sustainability, personal communication, April 29, 2016

Petroleum and Natural Gas

Notably, Multnomah County and the entire State of Oregon import 100 percent of their petroleum and natural gas. Puget Sound refineries provide more than 90 percent of Oregon's refined petroleum products (PBEM, 2012). Although natural gas does not provide the most energy to the region, it does contribute a significant amount of energy to the region's energy portfolio (DLCD, 2015). Natural gas in Multnomah County is provided by Northwest Natural Gas, a private, investor-owned utility. The most critical components for the natural gas system are large, high-pressure transmission mains. Local distribution systems, while important, are less important than the major components. Petroleum, like natural gas, is distributed via pipeline, marine vessels and trucks.

Pipelines that provide natural gas servicing Oregon travel along these routes (PBEM, 2012):

- From Washougal, Washington, to the Portland area
- From the Willamette Valley to Grants Pass
- From British Columbia and the Rocky Mountain region to the Portland area
- From British Columbia, entering the U.S. near Sumas, Washington, and roughly following Interstate 5 through Washington through to the Portland area
- From the Rocky Mountain region entering Oregon near Ontario
- From Alberta, Canada, entering the U.S. near Kingsgate, Idaho, through eastern Oregon, and leaving the state near Malin, before traveling to California and Nevada
- From Klamath Falls to Medford, Oregon, meeting with a pipeline in Stanfield, Oregon

Williams Northwest Pipeline and the TransCanada Gas Transmission Northwest are the main companies transporting natural gas into Oregon (ODOE and PUC, 2012).

There are no refineries or crude (unrefined) oil resources in Oregon (PBEM, 2012).

The Trans-Mountain pipeline brings petroleum from British Columbia. The Olympic and Chevron pipelines transport petroleum into Washington and Oregon.

Hydropower

Bonneville Power Administration (BPA) provides hydro-generated electricity to the state's consumer-owned utilities. The Bonneville Dam is BPA's major dam in the region, located on the Columbia River. Other dams in the region are located on the Willamette, Clackamas, and Sandy rivers (DLCD, 2015). In Multnomah County, there are 26 dams. Of those dams, there are seven with a high potential threat, five with a significant threat, and 14 with a low threat (DLCD, 2015). Hydropower dams on the Columbia River provide 27 percent of Multnomah County's electricity (PBEM, 2012).

Critical Energy Infrastructure Hub (CEI Hub)

A six-mile stretch of the Willamette River in Portland's Northwest Industrial Area contains the bulk of Oregon's critical energy infrastructure for petroleum, natural gas, liquefied natural gas and electricity. This area is also a regional crossroads for pipelines, transmission lines, rail, shipping and trucking (PBEM, 2012), and is commonly referred to as the Critical Infrastructure Hub (CEI Hub). The CEI Hub includes the following energy sector facilities (Pipelines International, 2009):

- All of Oregon's major liquid fuel port terminals
- Liquid fuel transmission pipelines and transfer stations
- Natural gas transmission pipelines
- A liquefied natural gas storage facility
- High-voltage electric substations and transmission lines
- Electrical substations for local distribution

The three energy sources – electricity, natural gas and liquid fuel – depend on each other; if one system is inoperable, it impacts another. For example, all sources rely on electricity to operate their systems. In addition, energy companies have operational interdependencies in the transportation and telecommunication sectors.

"In 2013, the Oregon Department of Geology and Mineral Industries (DOGAMI) conducted a study of the CEI Hub's earthquake risk entitled Earthquake Risk Study for Oregon's Critical Energy Infrastructure Hub (DOGAMI Open-File Report O-13-09). The study determined (a) the vast majority of facilities are constructed on soils susceptible to liquefaction and (b) significant seismic risk exists within the various energy sector facilities. The CEI Hub was identified as being highly vulnerable to a Cascadia Subduction Zone (CSZ) event" (DLCD, 2015).

Given the paramount importance of the CEI Hub to all the cities and unincorporated areas of Multnomah County, the State of Oregon and the Pacific Northwest region, it is extremely important to continue to assess current conditions of the CEI Hub and to continue an enhanced focus on the development of disaster resilience in this area. The City of Portland is presently conducting a risk assessment for the CEI Hub. Draft recommendations from that study inform the mitigation strategy for this plan update. Final results from that study will inform the next update of this plan.

2.6.3 Telecommunications

Telecommunications across the county, including but not limited to voice, data and internet services, are provided by several private, investor-owned companies, including:

- Quest
- Century Link
- Comcast

- Frontier
- Reliance Connects

For telecommunications, the most critical system components are the central offices, which contain the switch gear necessary to connect telephone calls. For data and internet services, the most critical system components are high-capacity fiber-optic links and peering facilities, which transfer traffic between carriers.

2.7 Historic and Cultural Resources

Historic and cultural resources are important to our community because they provide unique information and insight about our past societies and environments. It is important to all communities in the Planning Area to protect these resources from disaster events. Historic and cultural resources include structures, objects, sites and districts. Examples include unique architecture on buildings, prehistoric artifacts, burial sites, roads and bridges, earthworks, artwork, landforms and battlefield sites. These may be designated as historic and cultural resources by local, state and federal jurisdictions.

The National Register of Historic Places is an official registry for the preservation of historic and cultural resources. Find more information at http://www.oregon.gov/oprd/HCD/NATREG/pages/nrhp_natreglist.aspx. To be listed on the National Register of Historic Places, a district, site, building, structure or object must be 50 years or older, in general. Eligible properties also must have "integrity," or closely resemble their historic appearance. Integrity includes location, design, setting, materials, workmanship, feeling and association. Most importantly, a resource must be significant or physically connected with an important part of the past (Oregon Parks and Recreation, no date).

Historic buildings and structures, artwork, monuments, family heirlooms, and historic documents are often irreplaceable, and may be lost forever in a disaster if not considered in the mitigation planning process.

- Integrating Historic Property and Cultural Resource Considerations Into Hazard Mitigation Planning, FEMA 2005

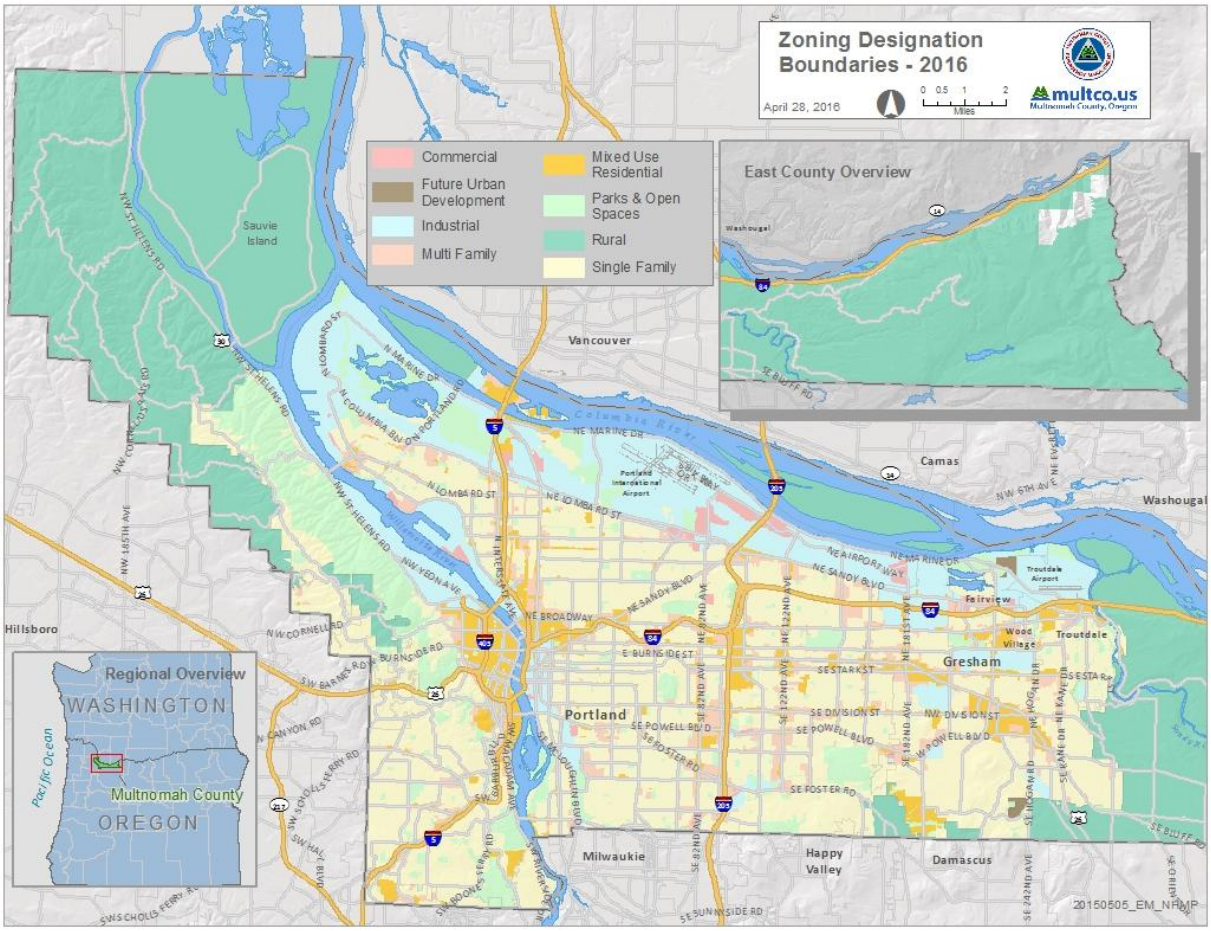
Gresham, Troutdale and the unincorporated areas of Multnomah County have several historic and cultural resources listed on the National Register of Historic Places**.** Wood Village and Fairview do not have any listed historic and cultural resources.

2.8 Land Use and Development

2.8.1 Land Use

The overall pattern of land use and development in Multnomah County varies from the large urban areas of Portland and Gresham to the smaller incorporated cities of Maywood Park, Fairview, Wood Village, Troutdale and Lake Oswego (a small part of which is in Multnomah County). The unincorporated parts of Multnomah County cover about half of the county by area, but only contain about 2% of the county's population. The unincorporated areas range from lightly developed areas in or near the urban growth boundaries of the cities to very small unincorporated communities in rural areas. Zoning for Multnomah County is shown in **Figure 2.8-1**.

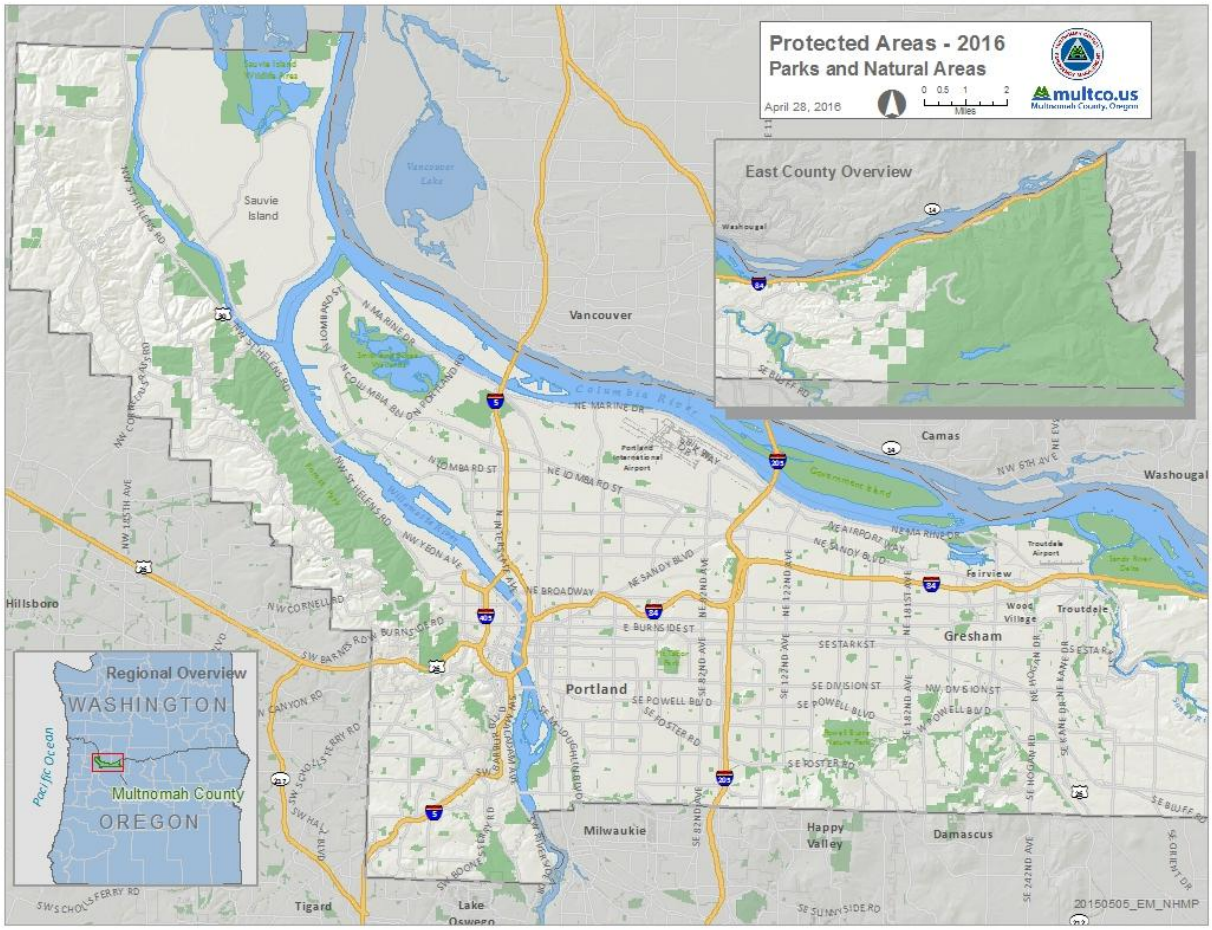
Figure 2.8-1: Zoning



Source: Metro, Regional Land Information System (RLIS), 2016

Eastern Multnomah County includes large forested areas that include both privately owned lands and National Forest lands, as well as the Columbia River Gorge National Scenic Area. Protected areas in and near Multnomah County are shown in **Figure 2.8-2**.

Figure 2.8-2: Protected Areas Source: Metro, Regional Land Information System (RLIS), 2016

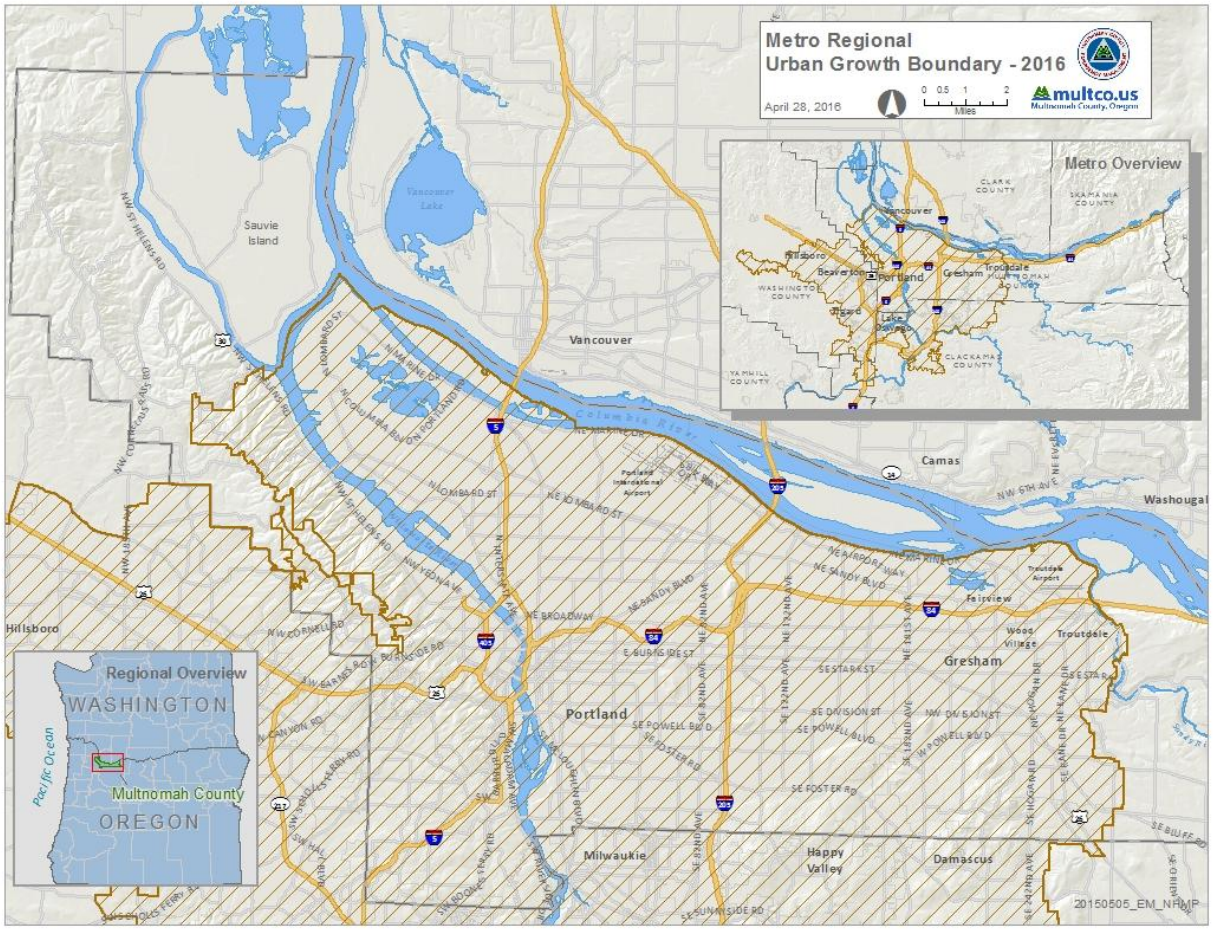


Source: Metro, Regional Land Information System (RLIS), 2016

2.8.2 Urban Growth Boundary

The Portland metropolitan area's urban growth boundary (UGB) controls urban expansion onto farm and forest lands (**Figure 2.8-3**). Every six years, the Metro Council reviews land supply in relation to population and employment forecasts for the next 20 years. In 2015, the Metro Council recognized that communities in the region have planned for expected growth inside the existing boundary, and therefore decided to not expand the UGB. The next review of the UGB will occur in 2018 (Metro, no date).

Figure 2.8-3: Urban Growth Boundary

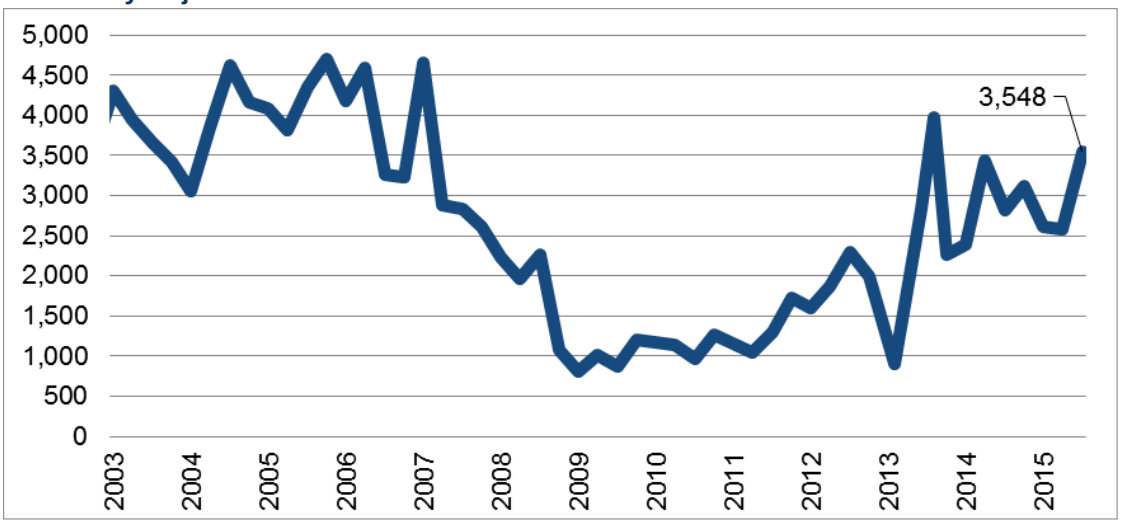


Source: Metro, Regional Land Information System (RLIS), 2016

2.8.3 New Development

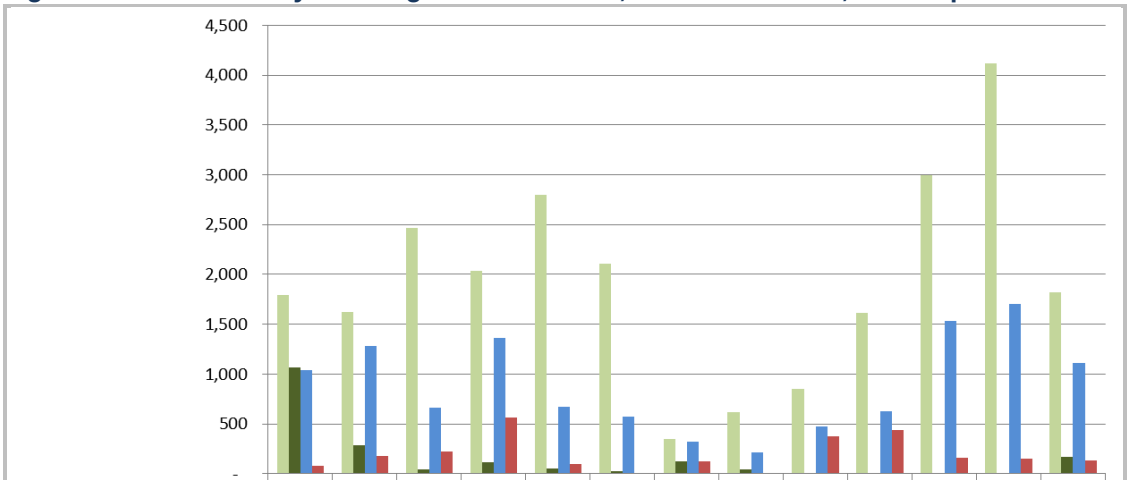
New development in the Portland metro area has picked up after the Great Recession, as illustrated by an uptick in building permits issued in 2012 and 2013 (**Figure 2.8-4**). Between 2010 and 2014, Multnomah County had 3,459 single-family residential building permits and 10,515 multi-family residential permits issued (U.S. Census Bureau). A majority of the multi-residential development has been in the City of Portland, but permits are again starting to be issued for multi-family projects outside of Portland (**Figure 2.8-5**).

Figure 2.8-4: Building Permits for New Private Housing, Portland-Vancouver-Hillsboro MSA, Seasonally Adjusted



Source: Terry, 2015

Figure 2.8-5: Multifamily Building Permits Issued, Number of Units, YTD Sept. 2015



	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
City of Portland	1,793	1,623	2,466	2,038	2,802	2,103	345	622	852	1,612	2,992	4,120	1,821
Multnomah County (excl PDX)	1,062	288	46	119	56	24	125	47	0	0	12	0	172
Washington County	1,040	1,279	664	1,364	674	572	319	212	473	630	1,537	1,703	1,108
Clackamas County	81	181	226	564	100	0	128	5	371	435	159	151	131

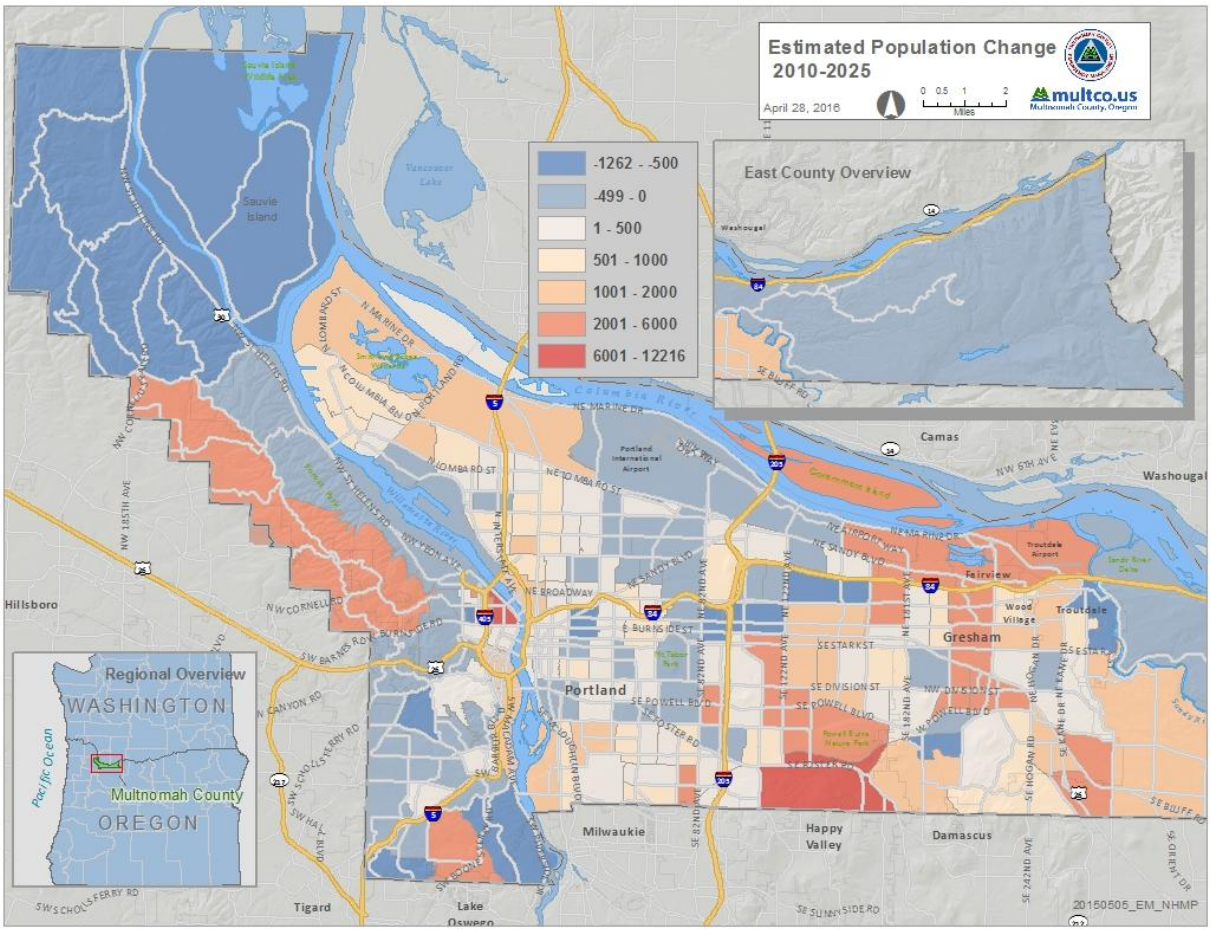
Source: Terry, 2015

2.8.4 Projected Development and Demographic Patterns

Demographers at Portland State University's Population Research Center have produced projections of change in racial/ethnic composition by census tract through 2025 (**Figures 2.8-6, -7, -8,** and **-9**). The greatest changes are expected to be a result of infill development and rapidly increasing property values. Future population growth may strain transportation systems; however, relative to other regions, the region has been aggressive in its plans for public transportation systems.

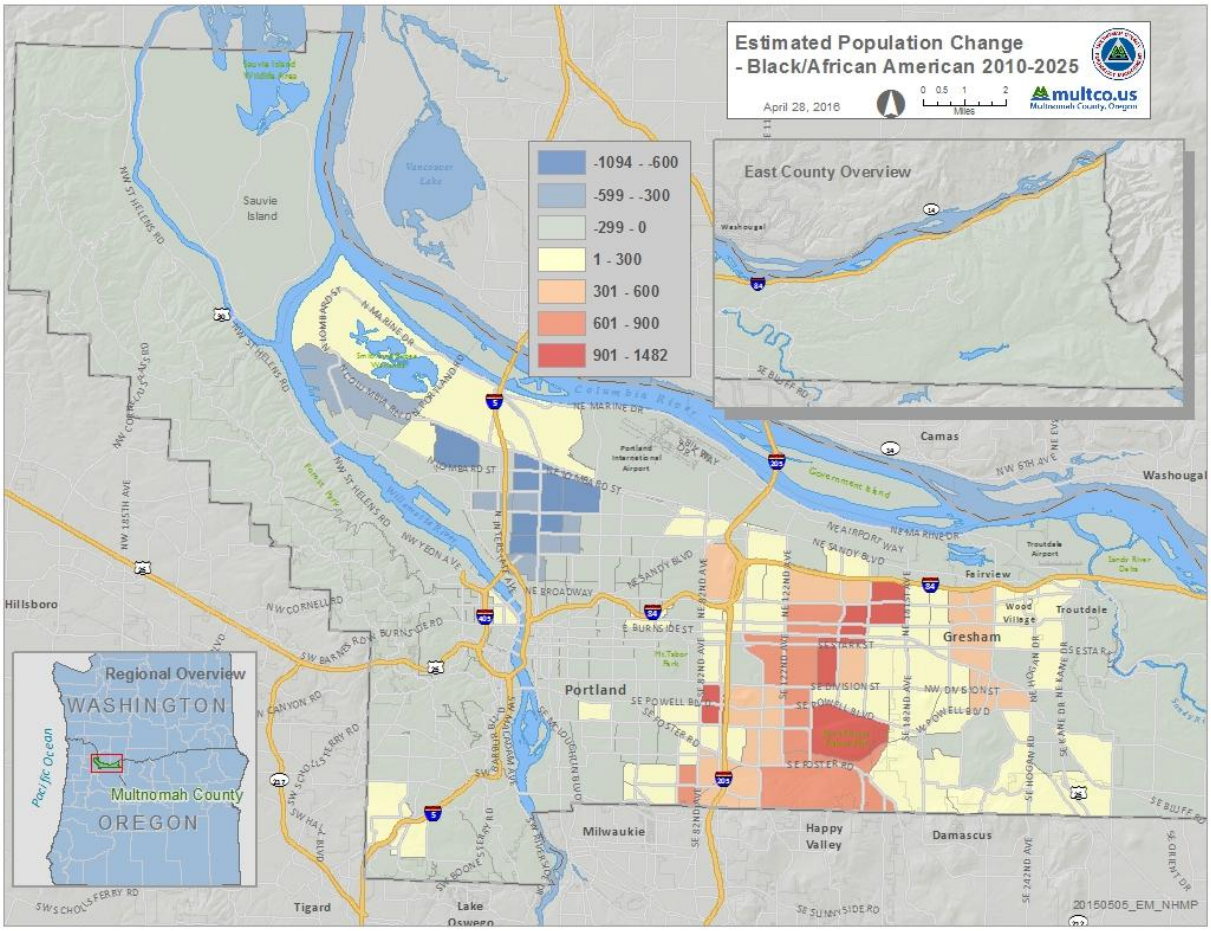
Forecasts predict that long-term residents may be displaced from some neighborhoods due to rising property values. Many displaced residents from inner neighborhoods are expected to move to areas with lower-cost housing, such as east Portland and Gresham. For example, demographers predict fewer Black/African American communities in north Portland and more in areas east of Interstate 205. In addition, a rise in new development near Mount Scott and Happy Valley is expected to bring more minority groups to those areas (Multnomah County Health Department, 2014).

Figure 2.8-6: Total Estimated Population Change, 2010–2025



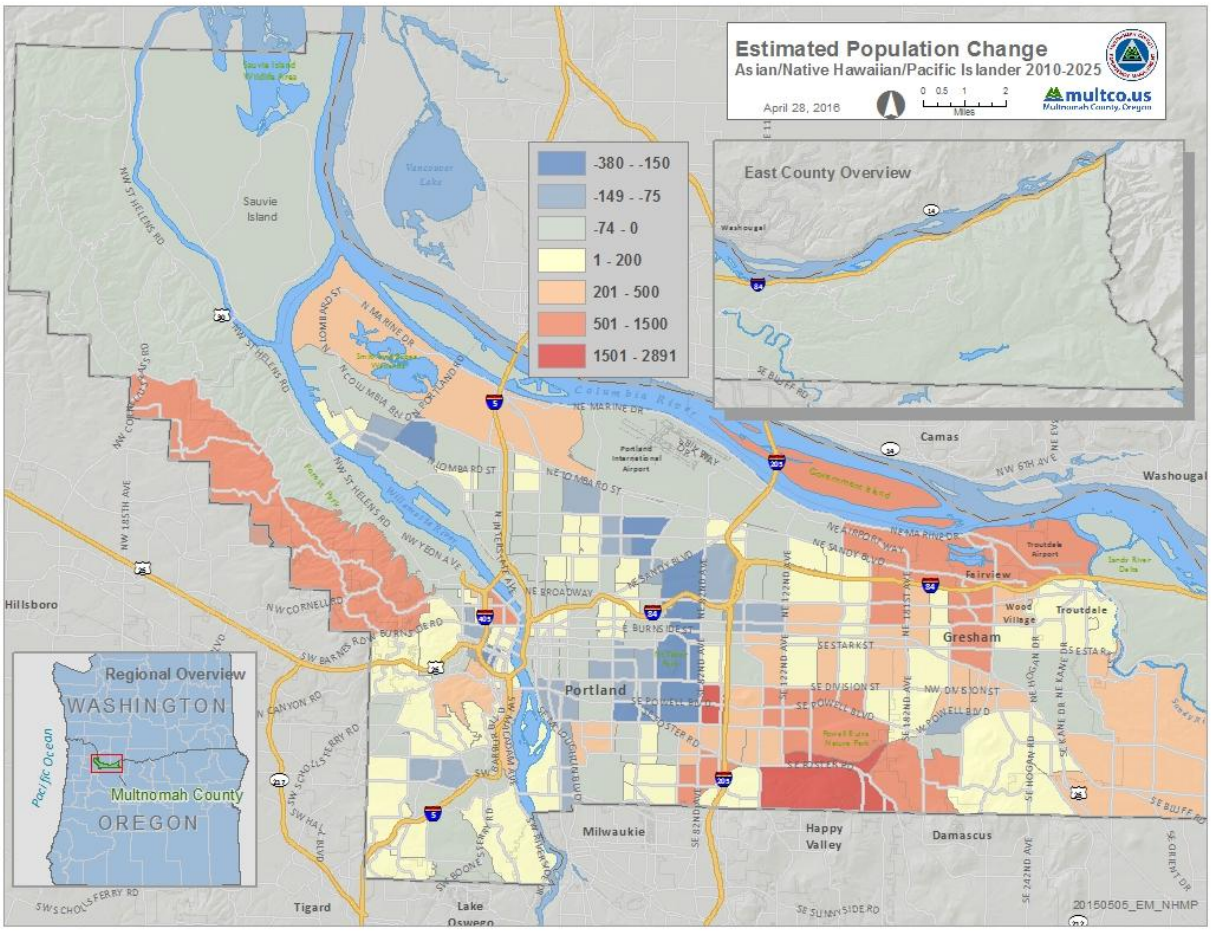
Source: Population Research Center, 2016

Figure 2.8-7: Black/African American Estimated Population Change, 2010–2025



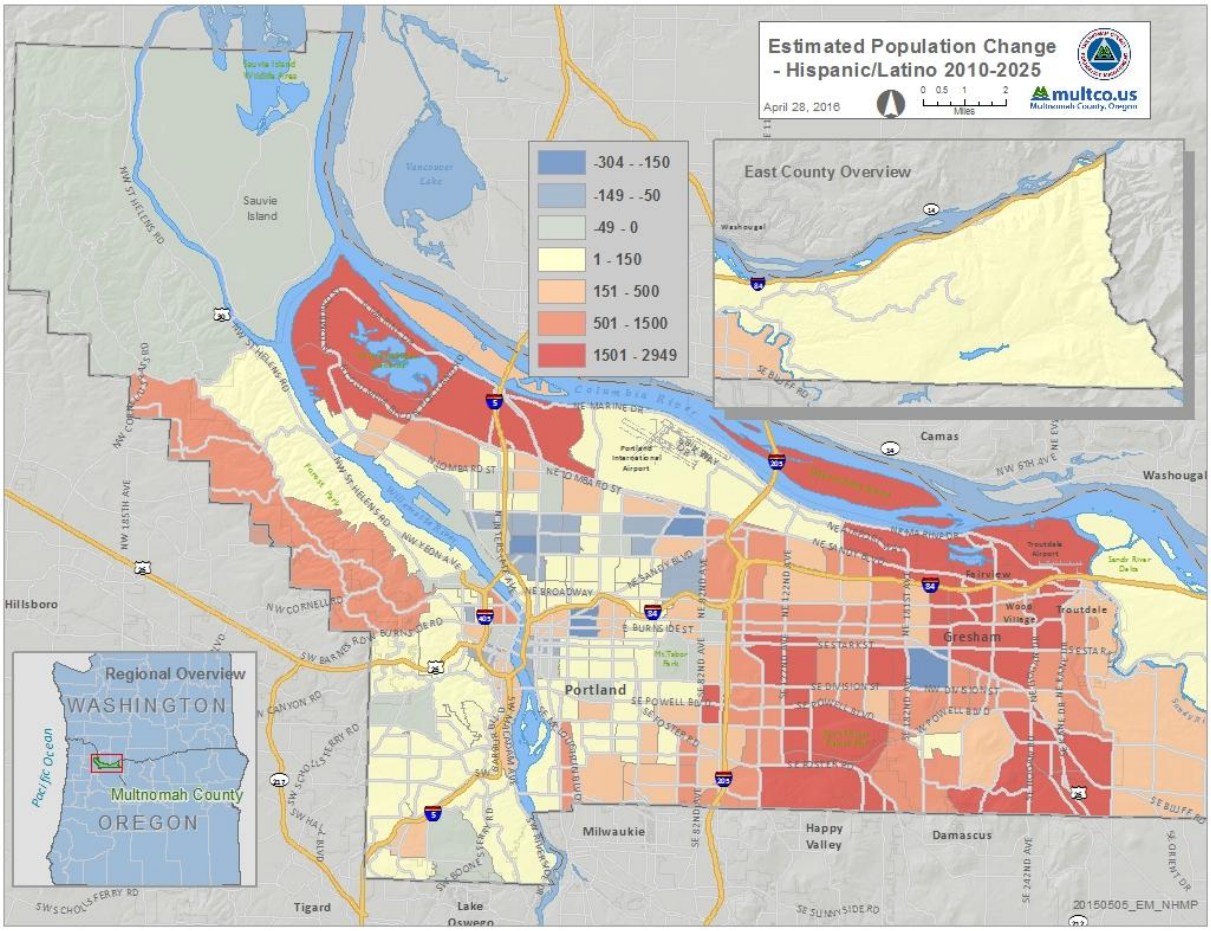
Source: Population Research Center, 2016

Figure 2.8-8: Asian, Native Hawaiian and Pacific Islander Estimated Population Change, 2010–2025



Source: Population Research Center, 2016

Figure 2.8-9: Hispanic/Latino Estimated Population Change, 2010–2025



Source: Population Research Center, 2016

2.9 Community Connectivity

2.9.1 Civic Engagement

Civic engagement is an important indicator of community connectivity, and is often measured by voter turnout in political elections. In Multnomah County, 82.5% of registered voters cast ballots for the 2012 Presidential General Election, which was similar to the statewide turnout rate (Multnomah County no date).

However, meaningful engagement encompasses more than voter registration and turnout rates, such as public engagement in local planning processes and policy decisions. It should be noted that marginalized communities, such as immigrant, refugee and low-income communities, do not play on an even social and political field in advocating for their own interests (Metro, 2015). There are often many institutional barriers that serve to exclude or limit participation from these communities, including (Metro, 2015):

- Language and cultural barriers, such as meeting and engagement methods that are not culturally appropriate due to publicizing methods, meeting time or location, or lack of accommodation.

- Differences in power dynamics, such as lack of knowledge of decision-making processes or relationships with decision-makers, and pre-existing mistrust of government based on previous experiences that may have included power imbalances, inauthentic processes or tokenization.

- Limited capacity — leaders from historically underrepresented communities often are asked to participate in numerous processes involving multiple government agencies and must prioritize their communities' needs and their own ability to participate; community members often require new knowledge, tools and experience that may require grassroots capacity building.

The Metro online Opt-In Survey, designed to inform regional policies, illustrates how white, more-affluent and more-educated residents are disproportionately aware of and using this tool, and are therefore more represented in public opinion surveys in the region. For example, close to 90% of respondents were White/Caucasian; over 40% of respondents had a post-graduate education; and over 30% of respondents had a household income of more than $100,000 (Metro, 2015).

Equity programs in many of the government agencies in Multnomah County are working on mitigating these systemic issues. Until progress is made, equitable civic engagement is a known area of weakness to achieving community resilience.

2.9.2 Social Services

The availability of social services before and after a disaster can impact a community's ability to bounce back, especially for those who do not have the personal resources to recover. In 2013, the Multnomah County Department of County Human Services (DCHS) published a strategic plan based on an assessment of DCHS social services. A goal of the assessment was to determine if county services were adapting to the changing needs of its clients. One component of the changing needs of the county's clients is a change in demographics of its client base. The assessment found DCHS programs are (1) aware of the changing demographics, (2) generally well-positioned to deliver services to the county's changing client base, and (3) using a variety of methods to meet the needs of its clients (Multnomah County, 2013). The audit also noted the most common barrier to reaching clients is limited resources for both county and community partner programs (Multnomah County, 2013).

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