Understanding Economic Conditions
Lane County, Oregon

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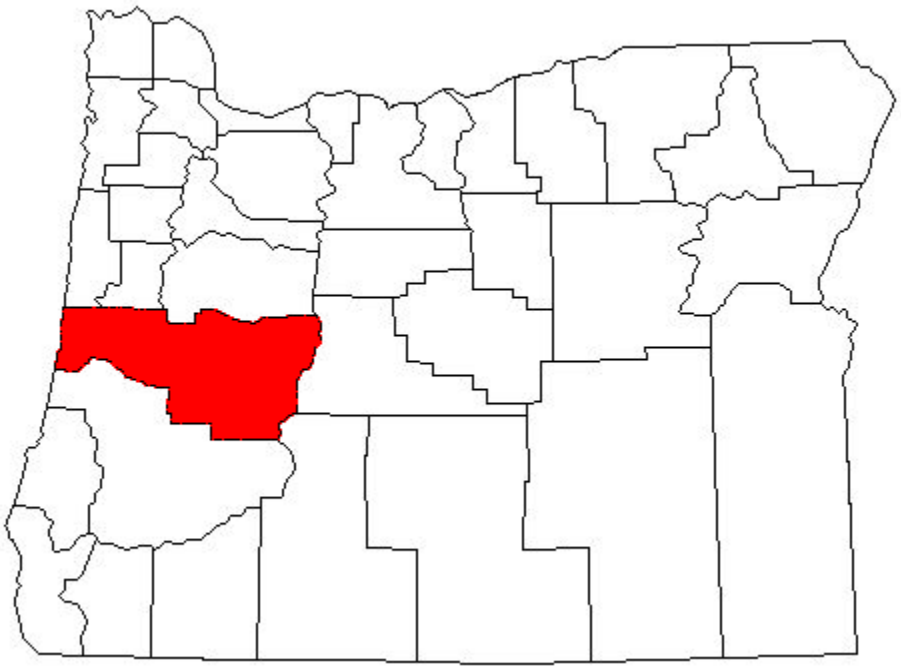
Introduction

The following report will use several economic metrics in order to better understand Lane County's economy. Employment trends at the county and national levels will be analyzed and compared, industries will be studied. Further, this report will look into the household income trends in Lane County and its subdivisions. It will also study the population distributions at different sub-county levels which will then be compared to the county as a whole. Lastly, this report will seek to find the optimal location for a new materials recovery facility in Lane County.

Economic History

Lane County is situated on the western coast of Oregon, roughly halfway between California and Washington states. The county's 4,620 square miles are bordered by Lincoln, Benton, and Linn County's to the north, Deschutes County to the east, and Douglas and Klamath County's to the south. The geographic features that border the county are the Pacific Ocean to the west and the Cascade Mountain Range to the east. The county is 90% forestland; the county has just twelve cities in addition to a large consortium of unincorporated communities. As of 2010, it was the fourth largest county in the state of Oregon in terms and population with 351,445 citizens ("Overview..." 1).

Figure 1. Map of Lane County in Oregon



Source: "Lane County, Oregon Genealogy."

The county was established in 1851 largely as a result of its location in the Willamette Valley, the terminal point of the Oregon Trail. The population began to expand rapidly shortly after 1851 when gold was found in the area of Bohemia Mountain, a peak in the Cascade Mountain Range that is located in the southeastern region of the county ("Overview..." 1). However, other than this temporary boom, Lane's economy has largely revolved around its forestland (Rooney 1).

For much of the twentieth century, manufacturing was Lane's biggest industry. This encompasses mostly wood manufacturing, though Lane's recreational vehicle manufacturing sector is also notable. Unfortunately, stiff environmental regulations and several economic recessions have caused a significant decline in the availability of manufacturing jobs in Lane County since the early 1990s. In 2002, manufacturing was finally overtaken by retail trade as Lane's largest industry (Rooney 1).

While Lane's manufacturing industry has continued to decline, other industries have risen up to take advantage of the shifting economy. As stated previously, retail trade has become a dominant force in Lane's economy. Agriculture, mainly in the form of nursery crops and Christmas trees, as well as tourism and food services have also continued to grow (Rooney 1). Education has been another bright spot for Lane County; this industry is anchored by Lane's second largest employer, the University of Oregon. Lastly, in 2009 retail trade was overtaken by health care as Lane's largest industry which continues to expand rapidly. This industry's largest employer, PeaceHealth Oregon, is also Lane County's largest employer (Census NAICS). The continuing shift in industry leaders suggests that Lane County is undergoing an economic transition which will lead to the continued growth to the diversified growth of smaller, non-dominant industries.

Location Quotient Analysis

Location quotient is an economic metric that compares an industry on the regional level to its counterpart at the national level. A high quotient (greater than 1) means that the region's concentration of that industry is higher than the national concentration; this is called a basic industry. This has the potential to reveal the underlying importance of an industry to the regional economy. For example, industries with high quotients are generally considered to be exporting their goods to other regions. If an industry has a high quotient and controls a large percentage of regional jobs, that industry is likely to be a cornerstone of the region's economy. The location quotient is calculated by dividing an industry's regional job concentration by its total regional job concentration, and then dividing this by the national industry job concentration divided by the total national job concentration.

Table 1. Lane County Location Quotients, 2011

NAICS	Industry Code Description	LQ	Basic Sectors
11----	Forestry, fishing, hunting, and agriculture support	**9.59**	Basic
21----	Mining	**0.12**	Non-Basic
22----	Utilities	**0.20**	Non-Basic
23----	Construction	**1.03**	Basic
31----	Manufacturing	**1.10**	Basic
42----	Wholesale trade	**0.94**	Non-Basic
44----	Retail trade	**1.26**	Basic
48----	Transportation & warehousing	**0.66**	Non-Basic
51----	Information	**1.05**	Basic
52----	Finance & insurance	**0.78**	Non-Basic
53----	Real estate & rental & leasing	**1.17**	Basic
54----	Professional, scientific & technical services	**0.72**	Non-Basic
55----	Management of companies & enterprises	**0.50**	Non-Basic
56----	Admin, support, waste mgt, remediation services	**0.67**	Non-Basic
61----	Educational services	**0.56**	Non-Basic
62----	Health care and social assistance	**1.21**	Basic
71----	Arts, entertainment & recreation	**0.94**	Non-Basic
72----	Accommodation & food services	**1.17**	Basic
81----	Other services (except public administration)	**1.00**	Non-Basic

Source: Census NAICS

From Table 1, above, Lane's most basic industry is forestry, fishing, hunting, and agriculture support with a location quotient of 9.59. This is likely because of Lane's high concentration of forestland which is unique to this region. The county's second most basic industry is retail trade with a location quotient of 1.26. The large gap between forestry and trade is reveals how potentially important the timber industry may be to Lane's economy. In total, 8 of the 19 industries are considered basic. Lane's most non-basic industries are mining and utilities with quotients of 0.12 and 0.20, respectively.

Economic Base Analysis

The economic base is the industries in a region that generate employment and income through export. For Lane County, the economic base is made up of the 8 basic industries highlighted in Table 1. To assess the overall impact of the basic industries on the regional economy as a whole, the economic base multiplier is used; it is the ratio of jobs created to basic job created. In *Economy of Cities*, Jane Jacob describes the mechanism behind the multiplier:

> ...Growing export work earns more imports for the city. Some of these increased imports go directly back into the growing export work. Other imports go into the local economy where they are incorporated into goods and services consumed by the city's growing population; others are destined for the local industries that supply components to the export work. (Jacobs 137-138).

The export work she references is that of the basic industries. To calculate the economic base multiplier, the basic industry employment figures are summed and then divided by the total regional employment figure. A multiplier that is close to 1 is considered "normal".

In 2011, the economic base multiplier for Lane County was 9.044. This means that for every basic job created, an additional 8 non-basic jobs will be created. Further, if Lane were to generate 1,000 jobs in its most basic industry, forestry, fishing, hunting and agricultural support, an additional 8044 non-basic jobs would be created. The high value of the multiplier suggests that Lane County's economy is strongly capable of benefitting from the growth of its basic industries, but that it is also heavily dependent on them in the case of an economic contraction.

Shift-Share Analysis

The shift-share analysis is important for discovering the mechanisms behind industry growth. Using national and regional employment figures, as well as employment growth figures (this analysis used growth between 2001 and 2011), the analysis can help to determine if regional industry growth should be credited to national or regional factors. The analysis consists of three parts: national share, industry mix, and regional shift. National share is how much a regional industry grew due to growth of the national economy; it is calculated by multiplying an industry's employment at the regional level by the national growth rate for said industry. The industry mix is how much a regional industry grew due to growth of said industry at the national level. The regional shift is how much a regional industry grew due to the some unknown regional factor; this regional factor is generally thought to be competitive advantage. It is also important to note that growth can be positive or negative.

Table 2. Lane County Shift-Share Analysis, 2001-2011

NAICS	Industry Code Description	National Share	Industry Mix	Regional Shift	Total Current Year Employment
11----	Forestry, fishing, hunting, and agriculture support	1,449	-242	33	1,240
21----	Mining	282	73	-205	150
22----	Utilities	153	-3	-29	121
23----	Construction	5,135	-1,257	126	4,004
31----	Manufacturing	13,777	-6,136	-1,866	5,775
42----	Wholesale trade	5,681	-492	-453	4,736
44----	Retail trade	18,856	-158	-534	18,164
48----	Transportation & warehousing	2,832	257	-136	2,953
51----	Information	2,202	-435	1,038	2,805
52----	Finance & insurance	3,868	-219	682	4,331
53----	Real estate & rental & leasing	2,161	-98	57	2,120
54----	Professional, scientific & technical services	6,778	689	-1,153	6,314
55----	Management of companies & enterprises	2,391	46	-955	1,482
56----	Admin, support, waste mgt, remediation services	6,652	262	-462	6,452
61----	Educational services	1,634	379	224	2,237
62----	Health care and social assistance	20,443	4,066	1,082	25,591
71----	Arts, entertainment & recreation	1,876	216	-22	2,070
72----	Accommodation & food services	13,699	1,932	-398	15,233
81----	Other services (except public administration)	4,974	-157	138	4,955
					110,734

Source: Census NAICS

Table 2, above, shows the results of the shift-share analysis for Lane County between 2001 and 2011; the green highlighted cells represent the basic industries from Table 1. The industry with the highest percentage of regional growth compared to national growth is information; educational services and the finance and insurance industry also grew significantly more at the regional level than at the national level. Conversely, mining and management of companies both lost a considerable amount of regional jobs as compared to their national growth. In terms of raw jobs added,

information and health care were the most prolific while manufacturing almost offset their growth entirely. The basic industries lost a total of 460 jobs, resulting in the loss of roughly 3,702 additional non-basic jobs.

The decline of manufacturing is likely due to the "Great Recession", as the decrease in housing demand led to a decrease in timber demand. This was exacerbated by the collapse of Oregon's recreational vehicle manufacturing industry. Health care is growing just above the national rate, suggesting a slightly larger percentage of "Baby Boomers" in the population that are now requiring more intensive health treatments. The recession likely encouraged more "Millennials" to seek out a college education, leading to the growth of Lane County's education industry that is largely based around the University of Oregon. The growth of the information sector, which largely consists of paper-based publishing, was possibly a result of the decrease in manufacturing. This decline may have caused an oversupply in timber which was then capitalized on by newspaper and book publishers that could benefit from cheaper paper.

Largest Basic Industry: Health Care and Social Assistance

In 2011, no basic industry in Lane County was large than health care and social assistance which employed 21,525 people. To understand this industry at a deeper level, the location quotient analysis was reapplied to the subsectors of this industry. This industry has four subsectors, as seen below in Table 3: ambulatory health care services, hospitals, nursing and residential care facilities, and social assistance. Of those, hospitals are the only basic sector with a location quotient of 1.52; following are nursing and residential facilities, ambulatory health care services, and social assistance.

Table 3. Lane County Location Quotient for Health Care and Social Assistance, 2011

Rank	NAICS	Industry Code Description	US	Lane County	LQ	Basic Subsectors
3	621	Ambulatory health care services	6,355,462	8,289	0.79	Non-basic
1	622	Hospitals	5,672,028	14,237	1.52	Basic
2	623	Nursing and residential care facilities	3,249,461	4,466	0.83	Non-basic
4	624	Social assistance	2,782,161	2,822	0.61	Non-basic
		Total	**18,059,112**	**29,814**		

Source: Census NAICS

Household Income

Based on the 2011 American Community Survey 5-Year Estimates, Lane County, as a whole, has a median income of $42,621. The county division with the highest median income is Coburg with $62,316, followed by Marcola with $58,828 and Lowell with $54,595. The county division with the lowest median income is Middle Siuslaw River-Triangle Lake with $32,083, followed by Florence with $34,579 and Eugene-Springfield with $41,777. Of the fifteen county divisions, only three fall below the county median income (2011 ACS).

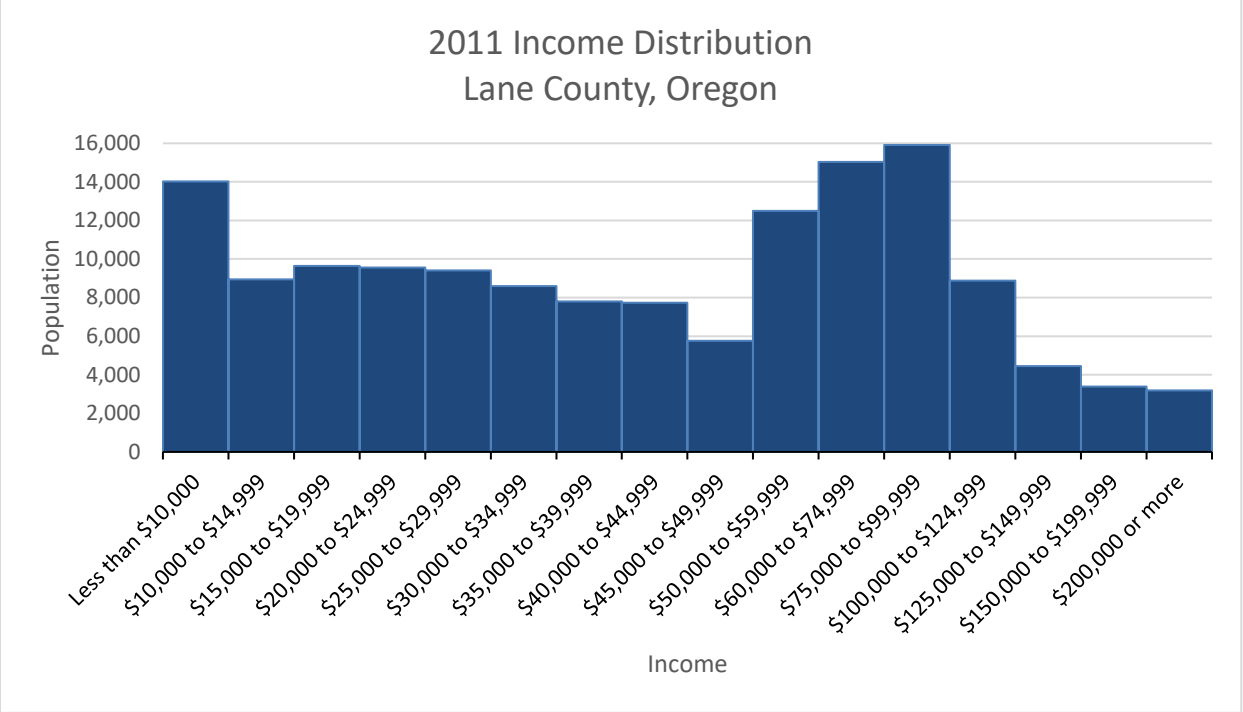
Table 4. Median Income of Lane County Divisions, 2011

County Subdivision	Median Income	Rank
Lane County, Oregon	**$ 42,621.00**	
Coburg CCD	$ 62,316.00	1
Marcola CCD	$ 58,828.00	2
Lowell CCD	$ 54,595.00	3
Creswell CCD	$ 53,440.00	4
Badger Mountain CCD	$ 53,393.00	5
Dunes City CCD	$ 51,023.00	6
Junction City CCD	$ 46,988.00	7
Pleasant Hill CCD	$ 44,766.00	8
Upper Siuslaw River CCD	$ 44,375.00	9
McKenzie River CCD	$ 43,750.00	10
Oakridge CCD	$ 43,101.00	11
Cottage Grove CCD	$ 42,990.00	12
Eugene-Springfield CCD	$ 41,777.00	13
Florence CCD	$ 34,579.00	14
Middle Siuslaw River-Triangle Lake CCD	$ 32,083.00	15

Source: 2011 ACS 5-Year Estimates

In 2011, Lane County's mean income was $57,120 (see Figure 2, below). The standard deviation was approximately $50,000 and the coefficient of variation was approximately 85%, meaning a highly dispersed distribution. The mode of the distribution was approximately $82,500 and the skewness of the distribution was 0.24, meaning the distribution is slightly positively skewed with a higher population concentrated towards the left side of the graph but also with a large protrusion towards the right side of the graph. Most Lane County households earn between $75,000 and $99,999, followed by $60,000 to $74,999 and then 0$ to $10,000. This last group is likely due to the high student population in Eugene. Only three income bins had less than 5,000 households represented; as expected, they were the three bins above $125,000 (2011 ACS).

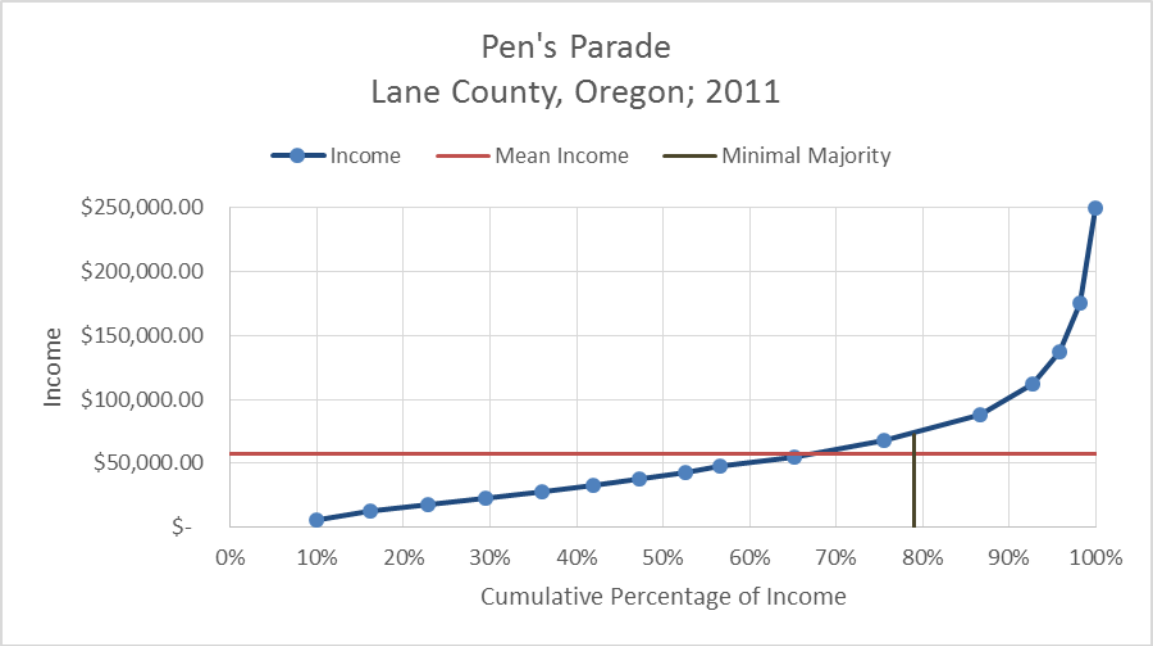
Figure 2. Income Distribution for Lane County, 2011



Source: 2011 ACS 5-Year Estimates

Pen's Parade is a graphical representation of income inequality. In the original version of Pen's Parade, Jan Pen, for which it is named, had every person lined up in order of income with their height proportional to their income. Over the one hour parade, the poorest people would not be visible but as the parade progressed, so would the height of the parade "participants". The end of the parade would contain the wealthiest people who often appeared to be several hundred times larger than the average person (Crook 1). In the graph, Figure 3, below, each household in Lane County is lined up in order from poorest to wealthiest, but income is used instead of apparent height. The graph shows that roughly 65% of Lane County households earn below the mean household income of $57,120. Further, from a cumulative standpoint, the lowest 79% of the population control just 50% of the Lane County's household income; this is denoted by the minimal majority line.

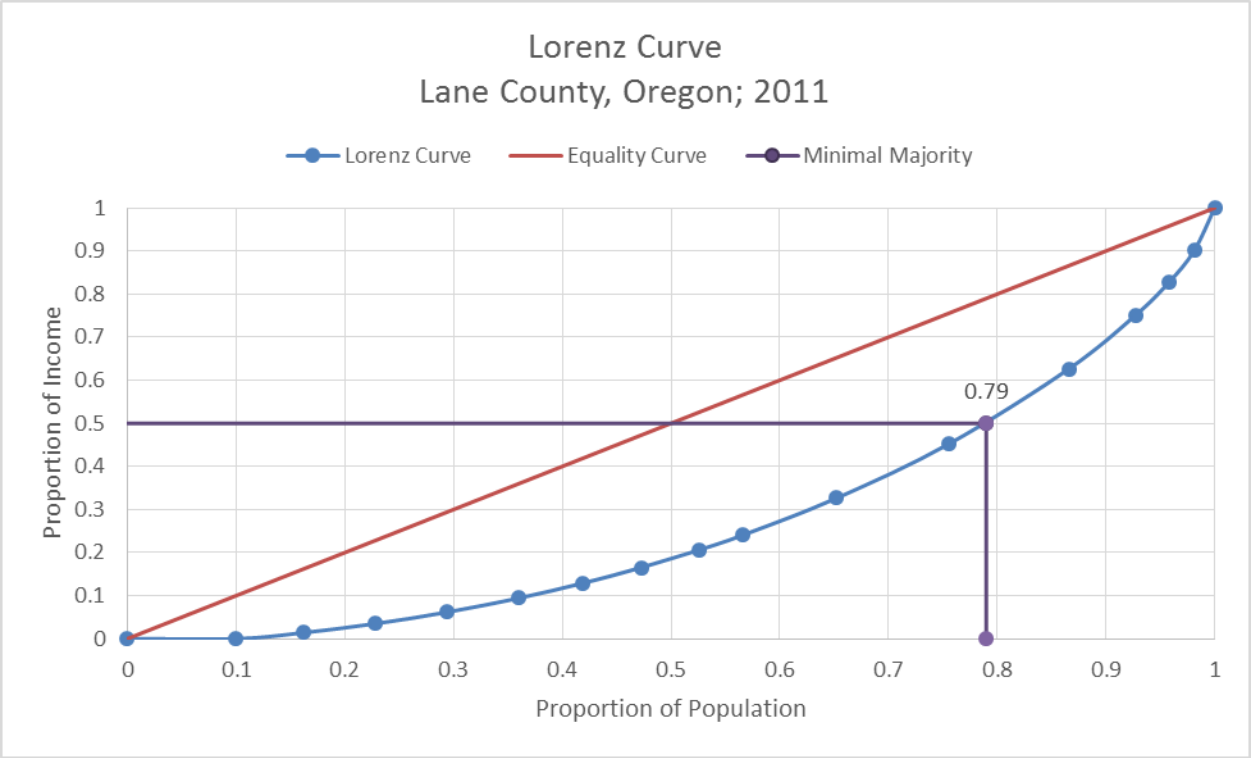
Figure 3. Pen's Parade for Lane County, 2011



Source: 2011 ACS 5-Year Estimates

Similar to Pen's Parade is the Lorenz Curve, which depicts the cumulative proportion of income that is controlled by a certain proportion of the population. In an ideal economy with perfect income equality, the Lorenz Curve would be a forty-five degree line from the points (0, 0) to the point (1, 1); this is labeled the equality curve in Figure 3, below. The further the Lorenz Curve is from the equality line, the higher the degree of inequality present in a region's income distribution becomes. This degree of inequality is described by the Gini Coefficient. The Gini Coefficient is calculated by finding the area between the equality line and the Lorenz Curve and dividing that number by 0.5; perfect equality is represent by a coefficient of 0 while perfect inequality is represented by a coefficient of 1. In 2011, the Gini Coefficient for Lane County was 0.46, which was slightly above the 0.45 figure that represented the income equality of the United States as a whole. Figure 3 also shows the same line of minimal majority from Figure 2, which shows that the lowest earning 79% of Lane County control only half of the county's total income.

Figure 4. Lorenz Curve for Lane County, 2011



Source: 2011 ACS 5-Year Estimates

Dissimilarity Index

The dissimilarity index measures how evenly two groups are distributed across a region by calculating the differences between the proportions of each group's population at a sub-regional level to the group's total regional population. It effectively states what percentage of one group must relocate to different sub-regions in order to produce the regional ratio of the two groups, thus a value of 0 indicates no dissimilarity while a value of 1 indicates total dissimilarity. This is not a measure of segregation per se, rather it is a measure of difference between a sub-region and the whole region. However, dissimilarity index outliers at the sub-regional level may indicate some segregation or other socioeconomic factors that should be investigated further.

For Lane County, the dissimilarity index was calculated between the black and white populations in both 2000 and 2010. One analysis used county divisions as the sub-regions, while a second analysis utilized census tracts as the sub-regions. Table 5, below, shows the results of both analyses.

Table 5. Lane County Dissimilarity Index Analyses

	White (2000)	Black (2000)	Dissimilarity (2000)	White (2010)	Black (2010)	Dissimilarity (2010)
County Divisions	292728	2506	**0.209**	310685	3369	**0.186**
Census Tracts	292728	2506	**0.308**	310685	3369	**0.255**

Source: 2000 Census, 2010 Census

In 2000, Lane County's white population totaled 292,728 and its black population totaled 2,506. Using county subdivisions, the county's dissimilarity index was 0.209 (2000 Census). This means that 20.9% of the population would need to relocate in order to create county division population proportions that were equal to the county population proportion. In 2010, the white population increased to 310,685 while the black population increased to 3,369 (2010 Census). The dissimilarity index decreased to 0.186, meaning that in 2010, the population proportions in the county divisions more accurately reflected the population proportion of Lane County as a whole. Using census tracts as the sub-regions, the dissimilarity indexes were 0.308 and 0.255 in 2000 and 2010, respectively. This difference is due to grouping. Population proportions within census tracts have more dissimilarity which may arise from the smaller geographic regions. Further, since the county dissimilarity index is the sum of all sub-regional dissimilarity indexes, the fact that there are 78 census tracts, as compared to 15 county divisions, may have factored into the increased county dissimilarity index for the census tract analysis.

Gravity Modeling

A new materials recovery facility, where recyclables are separated into different categories prior to resale or disposal, has been approved for construction in Lane County. In order to find the optimal location for this facility, the county subdivisions were analyzed by their distance between one another and their population. The distance between the host municipality and all other municipalities was calculated, weighted by population, and summed to achieve a "total ton miles per week" figure. This analysis was completed on the notion that the most cost effective facility location was the one in which total ton miles per week was minimized; the results can be viewed in Table 6, below. Several assumptions were made: the facility would be centrally located in each municipality, each citizen generates, on average, 10 pounds of trash per week, and trash is collected once per week. Further, all distances were calculated "as the crow flies"; using actual road networks would have generated a more accurate distance figure.

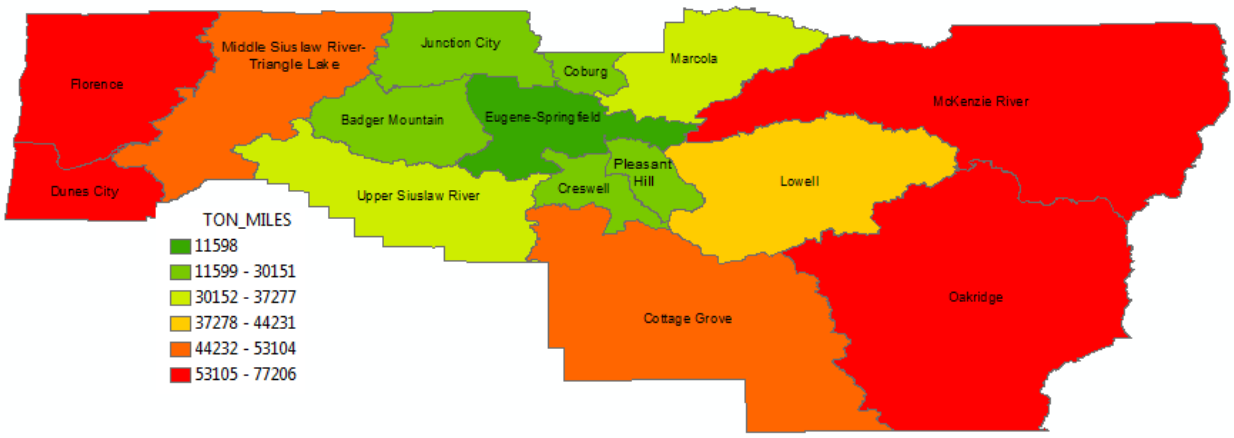
Table 6. "Cost" of Materials Recovery Facility for each Host Municipality

RANK	HOST MUNICIPALITY	TOTAL TON MILES PER WEEK
1	Eugene-Springfield	11598.098
2	Creswell	23472.925
3	Coburg	23706.508
4	Pleasant Hill	25841.826
5	Badger Mountain	28295.881
6	Junction City	30150.843
7	Upper Siuslaw River	34143.910
8	Marcola	37277.321
9	Lowell	44230.933
10	Middle Siuslaw River-Triangle Lake	49501.401
11	Cottage Grove	53103.905
12	Florence	71516.173
13	Dunes City	74457.273
14	McKenzie River	77114.139
15	Oakridge	77206.403

Source: Michael Borsellino

The analysis suggests that the Eugene-Springfield municipality is the optimal host site for the new materials recovery facility. This location would yield just 11,598 ton miles of recyclables per week. This is approximately 68% fewer ton miles per week than the runner-up, Creswell; it is also well under the average of 44,108 ton miles per week. Eugene-Springfield is centrally located (see Figure 5, below) in Lane County, meaning that total miles traveled are reduced. In Figure 5, below, it is evident that distance from the center point of Lane County is of huge importance when finding the optimal site, as the most optimal subdivisions are all centrally located. Eugene-Springfield also has the largest subdivision population, this means that the subdivision that generates the most trash does not have to move its trash; this significantly reduced the total ton miles factor in this calculation.

Figure 5. Optimal Location for Material Recovery Facility



Source: Michael Borsellino

A crucial misstep in this analysis is the assumption that there is an adequate space in Eugene-Springfield for this facility. Being an urban area, large lots in Eugene-Springfield are not only rarer, but they also come at higher costs, both in initial investment and in taxes (or, in the case of a publicly owned facility, potential tax losses). Further, this analysis only factors in the "import" chain for this facility. However, this facility plans to resell and dispose of recycled materials, thus an "export" chain analysis is equally important. For example, this facility should be close to a disposal site for unrecyclable materials. As a result, this analysis is a good start to finding an optimal location for the materials recovery facility, but it is certainly not the final analysis.

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