

3. Trends & Projections

This section of *Connections 2040* summarizes the trends in demographics, economics, land use and transportation patterns that the Duluth-Superior metropolitan area has experienced in recent years.

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INTRODUCTION

An assessment of the current and future transportation needs in the Duluth-Superior metropolitan area begins with a look at trends in population growth, demographics, employment, land use, and travel behavior. The size, makeup, and characteristics of the population exert different demands throughout the transportation system. Together, these things influence both travel patterns and subsequent decisions in transportation investment.

Geographic Definitions

Trends regarding population, demographics, economics, and other characteristics are tracked using data published by the U.S. Census Bureau and other agencies. For metropolitan areas like Duluth-Superior, such data is collected and delivered according to at least one of three geographic levels: the metropolitan statistical area (MSA), the urbanized area (UZA), or the individual municipalities that comprise the metropolitan planning organization (MPO).

Metropolitan Planning Organization (MPO)

The Duluth-Superior Metropolitan Interstate Council (MIC) is the federally designated MPO for the area. It is a bi-state MPO comprised of three cities and seven townships on the Minnesota side of the harbor and one city, two villages, and three towns on the Wisconsin side. The boundary of the MPO is depicted in Figure 3.1. Census data regarding population, demographics, and jobs can be assessed in terms of this boundary, but some economic and transportation related data cannot. Throughout Connections 2040, this geographical unit will be referred to as the “metropolitan area”, “metro area”, “MIC area”, or “MPO”.

Urbanized Area Boundary (UZA)

The Duluth-Superior UZA boundary delineates the portion of the MPO considered to be “urban” based on the concentration of people and impervious surfaces. This is the smallest unit with which some employment and transportation related data are delivered (Figure 3.2).

Metropolitan Statistical Area (MSA)

The Duluth-Superior MSA is a much larger geography that contains the MPO. It includes all the counties considered to have a close economic tie to the metropolitan area. Trends in population, workforce, and transportation are all available for this geographic area and can be easily compared (Figure 3.3).

Figure 3.1:

The Duluth-Superior MPO boundary

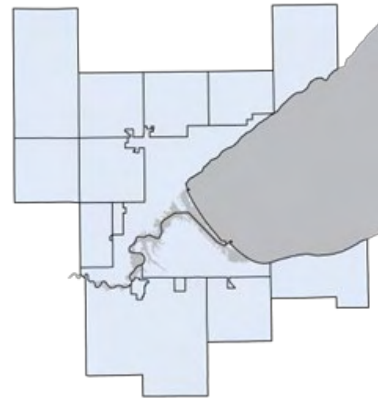


Figure 3.2:

The Duluth-Superior UZA

The Duluth-Superior UZA is represented by shaded area in the center.

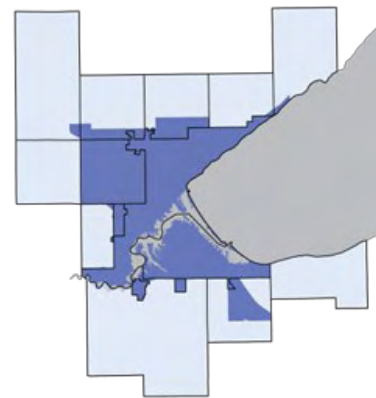
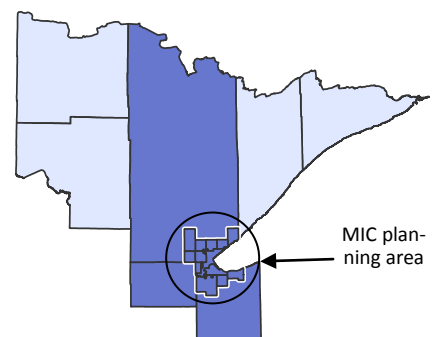


Figure 3.3:

The Duluth-Superior MSA

The Duluth-Superior MSA is represented by shaded area in the center.



POPULATION & DEMOGRAPHICS

Trend: Modest increases in population have been occurring mostly outside the urban center; aging seniors will continue to represent a larger percentage of the population, and households will likely continue to decrease in size.

Historical Population Trends

According to data from past decennial censuses, the population of the Duluth-Superior area has remained relatively stable. Modest gains have reversed a downward trend in the 1980's and 1990's, and in 2010 the entire MIC area had gained 2,462 more people than in 2000 (Table 3.1).

Much of the area's growth, however, has been occurring in the cities, villages and townships which surround the urban centers of Duluth and Superior. The City of Hermantown, by far experienced the most growth, increasing by nearly 2,000 people, while the other surrounding communities together grew by 1,273 people. The growth in these communities have been supplanting population losses in the urban core, which signifies a spreading out of the population within the metro area.



Pedestrian traffic in Canal Park, Duluth

Table 3.1: Historical population trends in the Duluth-Superior metropolitan area (1980 to 2010)

Area	1980	1990	% Change	2000	% Change	2010	% Change
St. Louis Co.	222,229	198,213	-10.8%	200,528	1.2%	200,226	-0.2%
MIC portion (MN)	116,944	109,841	-6.1%	113,033	2.9%	115,242	2.0%
Duluth	92,811	85,493	-7.9%	86,918	1.7%	86,265	-0.8%
Hermantown	6,759	6,761	0.0%	7,448	10.2%	9,414	26.4%
Proctor	3,180	2,974	-6.5%	2,852	-4.1%	3,057	7.2%
Rice Lake T.	3,861	3,883	0.6%	4,139	6.6%	4,095	-1.1%
Grand Lake T.	2,166	2,355	8.7%	2,621	11.3%	2,779	6.0%
Lakewood T.	1,680	1,799	7.1%	2,013	11.9%	2,190	8.8%
Canosia T.	1,562	1,743	11.6%	1,998	14.6%	2,158	8.0%
Solway T.	1,665	1,772	6.4%	1,842	4.0%	1,944	5.5%
Duluth T.	1,604	1,561	-2.7%	1,723	10.4%	1,941	12.7%
Midway T.	1,656	1,500	-9.4%	1,479	-1.4%	1,399	-5.4%
Douglas Co.	44,421	41,758	-6.0%	43,287	3.7%	44,159	2.0%
MIC portion (WI)	34,437	31,686	-8.0%	32,133	1.4%	32,386	0.8%
Superior	29,571	27,134	-8.2%	27,368	0.9%	27,244	-0.5%
T. of Superior	2,065	1,911	-7.5%	2,058	7.7%	2,166	5.2%
T. of Parkland	1,496	1,326	-11.4%	1,240	-6.5%	1,220	-1.6%
T. of Lakeside	572	569	-0.5%	609	7.0%	693	13.8%
V. of Superior	480	481	0.2%	500	4.0%	664	32.8%
V. of Oliver	253	265	4.7%	358	35.1%	399	11.5%
TOTAL MIC AREA	151,381	141,527	-6.5%	145,166	2.6%	147,628	1.7%

Source: US Census Bureau, 2014.

Population Density

While growth in the metro area appears to be moving further out from the core cities of Duluth and Superior, the adjacent cities of Hermantown and Proctor, as well as the Village of Oliver, and the Village of Superior have all seen significant increases in their population per square mile of available land, or population density (Table 3.2).

While the general trends shown in Table 3.2 have implications for the planning, funding, and maintenance of transportation assets, it is an incomplete picture, geographically. Map 3.1 on the following page displays population density at the census block level in 2010 and shows how - despite decreases in population and population density - a substantial portion of the area's residents live along the shore in Downtown Duluth and near Downtown Superior.

Map 3.2 shows the additions and subtractions of population between the years 2000 and 2010. This imagery helps to show that much of the added growth has occurred along the State Highway 53 corridor in Duluth and Hermantown.



Examples of large multi-residential units near downtown Duluth.

Table 3.2: Changes in population density in the Duluth-Superior metropolitan area (2000 to 2010)

Area	Total Area (Square miles)	Population 2000	2000 Density (people per sq. mi.)	Population 2010	2010 Density (people per sq. mi.)	Change in Pop. Density
MIC (MN)	398.8	113,033	283	115,242	289	6
Duluth	87.4	86,918	994	86,265	987	-7
Hermantown	34.4	7,448	217	9,414	274	57
Proctor	3.0	2,852	951	3,057	1,019	68
Rice Lake T.	33.5	4,139	124	4,095	122	-1
Grand Lake T.	71.5	2,621	37	2,779	39	2
Lakewood T.	27.8	2,013	72	2,190	79	6
Canosia T.	35.7	1,998	56	2,158	60	4
Solway T.	35.7	1,842	52	1,944	54	3
Duluth T.	51.8	1,723	33	1,941	37	4
Midway T.	18.0	1,479	82	1,399	78	-4
MIC (WI)	242.2	32,133	133	32,386	134	1
Superior	55.7	27,368	492	27,244	490	-2
T. of Superior	107.8	2,058	19	2,166	20	1
T. of Parkland	35.5	1,240	35	1,220	34	-1
T. of Lakeside	39.9	609	15	693	17	2
V. of Superior	1.2	500	403	664	535	132
V. of Oliver	2.1	358	172	399	192	20
TOTAL MIC AREA	641.0	145,166	226	147,628	230	4

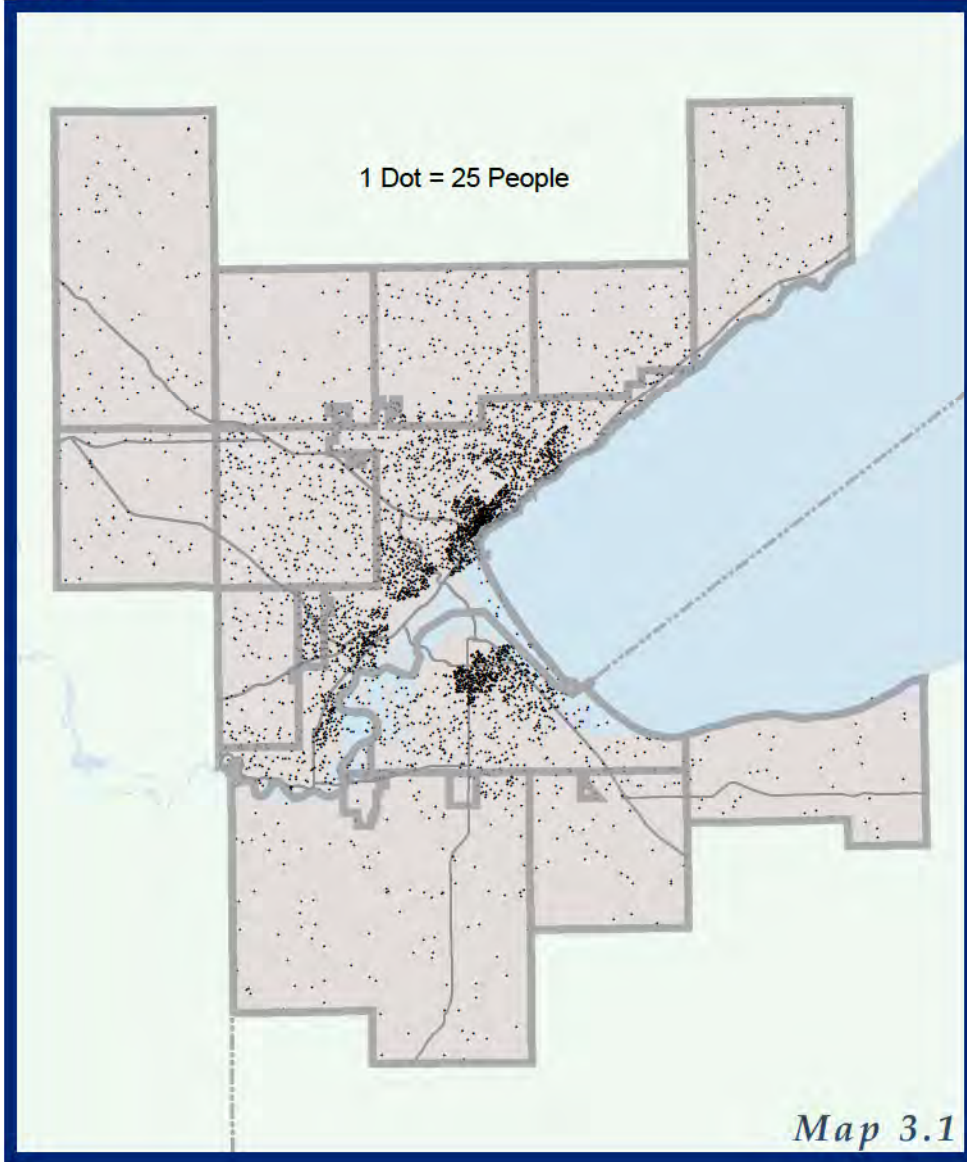
Source: US Census Bureau, 2014.



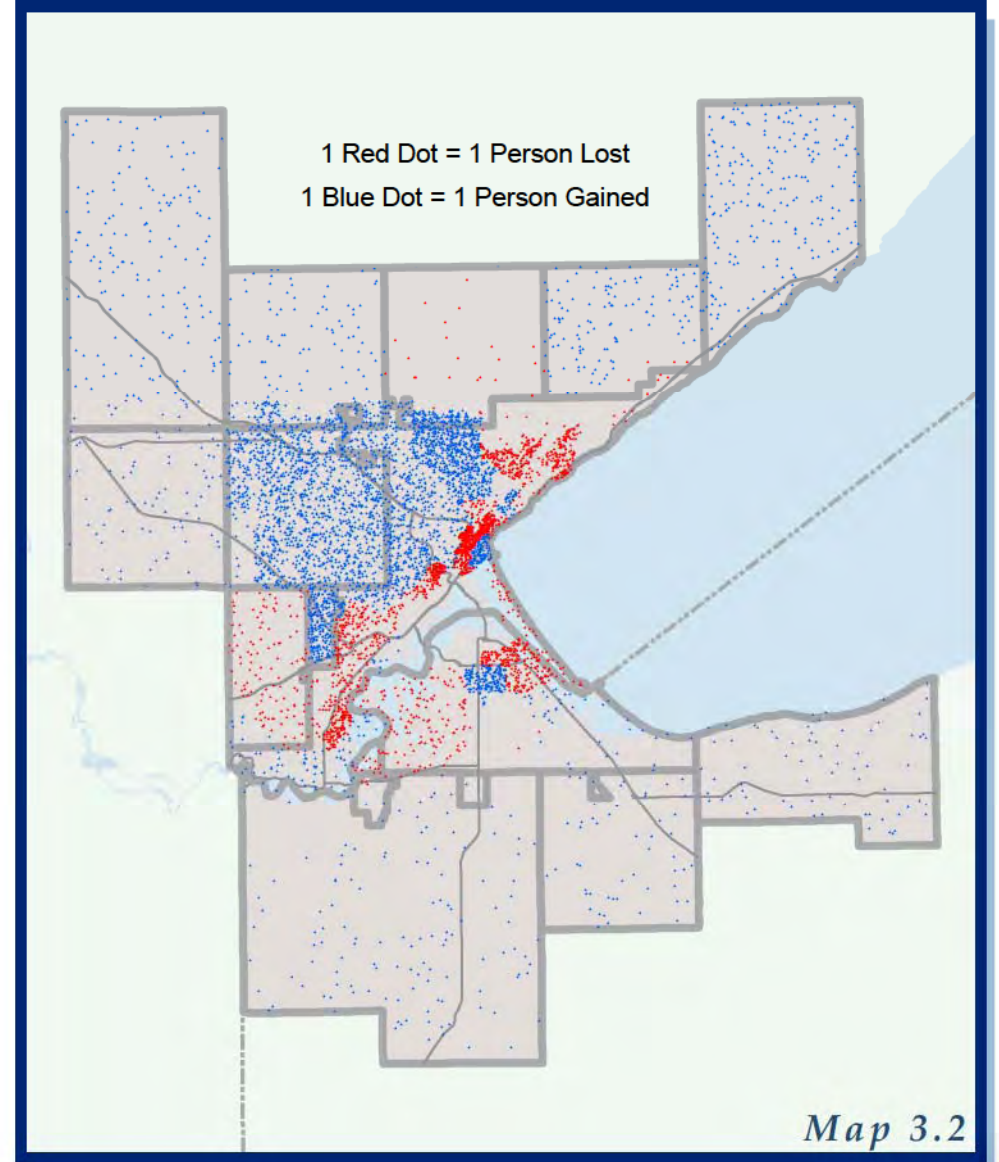
Duluth - Superior Population Density & Change



*Population Density
2000*



*Population Density Changes
2000-2010*



Household Size

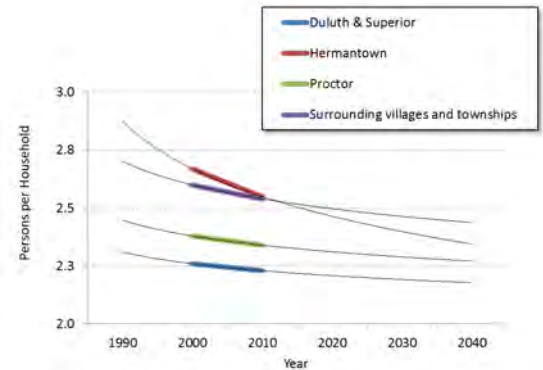
Data regarding average household size shows shrinking household sizes in each of the MIC area’s communities. This is consistent with Minnesota and Wisconsin statewide trends in declining average household sizes. It is also consistent with a progressively aging population in the metro area, as discussed on page 3-8.

As shown in Table 3.3 below, several of the towns and townships surrounding the Duluth-Superior urbanized area have experienced the largest decreases in average household size. On average, however, the average household size in these areas went from 2.6 persons per household to 2.5 in 2010. In contrast, the City of Hermantown went from 2.7 persons to 2.5.

When projecting this data out logarithmically to a year-2040 planning horizon, a pattern in which household sizes in the urban area will be around 2.3 persons while it will remain above 2.4 in the surrounding townships (Figure 3.4).

Figure 3.4:

Trends in average household sizes in the Duluth-Superior metropolitan planning area



Source: U.S Census Bureau (2014).

Table 3.3:
Changes in average household size in the MIC area (2000 to 2010)

Area	Average persons per household in 2000	Average persons per household in 2010	% Change
MIC (MN side)			
Duluth	2.26	2.23	-1.3%
Hermantown	2.67	2.55	-4.5%
Proctor	2.38	2.34	-1.7%
Rice Lake T.	2.77	2.54	-8.3%
Grand Lake T.	2.66	2.52	-5.3%
Lakewood T.	2.84	2.74	-3.5%
Canosia T.	2.66	2.58	-3.0%
Solway T.	2.74	2.57	-6.2%
Duluth T.	2.58	2.59	0.4%
Midway T.	2.66	2.56	-3.8%
MIC (WI side)			
Superior	2.26	2.23	-1.3%
T. of Superior	2.69	2.54	-5.6%
T. of Parkland	2.68	2.44	-9.0%
T. of Lakeside	2.69	2.68	-0.4%
V. of Superior	2.39	2.22	-7.1%
V. of Oliver	2.82	2.51	-11.0%
Minnesota	2.52	2.45	-2.8%
Wisconsin	2.50	2.41	-3.6%
United States	2.59	2.59	0.0%

Source: US Census Bureau, SF100%2000; 2006-2010 5-year ACS (2014).

Population Projections

For the purposes of long-range planning, two growth scenarios for the Duluth-Superior metropolitan area were compared: a conservative growth estimate and an aggressive growth estimate. Under the conservative estimate, the population of the Duluth-Superior area would be 158,413 by the year 2040. The aggressive scenario would exceed this by nearly 15,000 more people. Both scenarios are shown as straight-line projections in Table 3.4 and Figure 3.5 below.

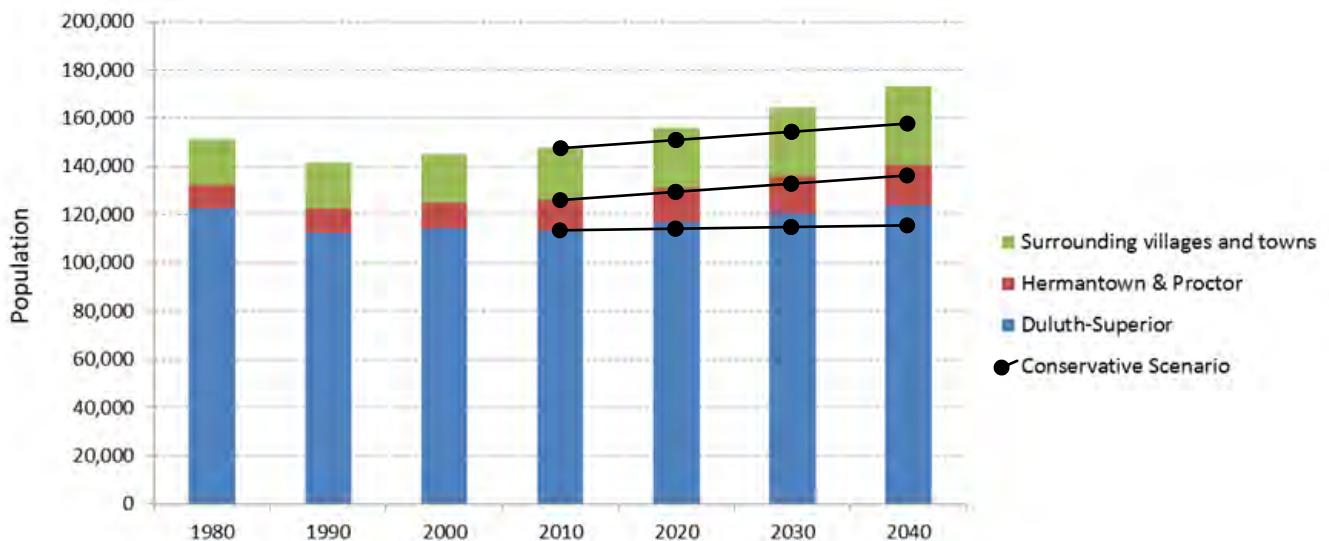
These 25-year growth estimates were developed to help anticipate future development patterns and the potential need for certain transportation investments. How these estimates were derived and their implications for planning and policy development are addressed further in the “Land Use & Travel Demand Patterns” discussion starting on page 3.20.

Table 3.4: Population projections for the Duluth-Superior metropolitan area (2010 to 2040)

Area	2010	2020 Projection		2030 Projection		2040 Projection		Total Change (30 years)			
	Actual	Conservative	Aggressive	Conservative	Aggressive	Conservative	Aggressive	Conservative	% Change	Aggressive	% Change
MIC (MN)	115,242	118,210	121,919	121,179	128,595	124,147	135,272	8,905	7.7%	20,030	17.4%
Duluth	86,265	86,616	88,763	86,966	91,261	87,317	93,759	1,052	1.2%	7,494	8.7%
<i>Duluth % increase</i>		0.4%	2.9%	0.4%	2.8%	0.4%	2.7%				
Hermantown	9,414	10,501	10,788	11,589	12,162	12,676	13,536	3,262	34.7%	4,122	43.8%
<i>Hermantown % increase</i>		11.6%	14.6%	10.4%	12.7%	9.4%	11.3%				
Proctor	3,057	3,131	3,165	3,206	3,272	3,280	3,380	223	7.3%	323	10.6%
<i>Proctor % increase</i>		2.4%	3.5%	2.4%	3.4%	2.3%	3.3%				
Townships (MN Side)	16,506	17,962	19,203	19,418	21,900	20,874	24,597	4,368	26.5%	8,091	49.0%
<i>Township % increase</i>		8.8%	16.3%	8.1%	14.0%	7.5%	12.3%				
MIC (WI)	32,386	33,013	34,201	33,639	36,017	34,266	37,832	1,880	5.8%	5,446	16.8%
Superior	27,244	27,357	28,149	27,471	29,053	27,584	29,958	340	1.2%	2,714	10.0%
<i>Superior % increase</i>		0.4%	3.3%	0.4%	3.2%	0.4%	3.1%				
Villages and towns (WI Side)	5,142	5,655	6,053	6,169	6,963	6,682	7,874	1,540	29.9%	2,732	53.1%
<i>Villages & Townships % increase</i>		10.0%	17.7%	9.1%	15.0%	8.3%	13.1%				
TOTAL MIC AREA	147,628	151,223	156,120	154,818	164,612	158,413	173,104	10,785	7.3%	25,476	17.3%

Source: URS Corp, 2014.

Figure 3.5: Population trends and projections for the Duluth-Superior metropolitan area (1980 to 2040)



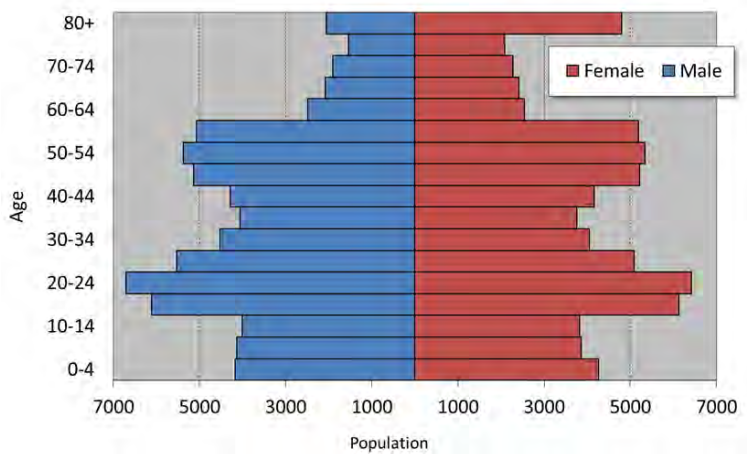
Population Diversity

As with the size and density of a population, the age, race, and income profiles of an area also have important implications for transportation planning decisions. Different subsets of a population tend to have different needs when it comes to the provision of transportation services or the design of transportation infrastructure. Changes in these demographic profiles may signal needed shifts in transportation policy and investments. What follows is a summary of trends regarding age, race, and poverty in the Duluth-Superior area.

Age

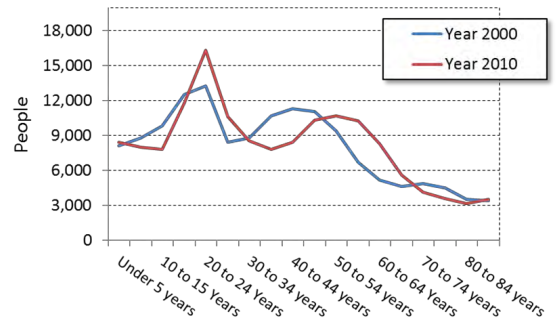
The population of the Duluth-Superior area is characterized by its Baby Boomer and college-aged populations, which can be seen in Figure 3.5 below. The effects of these groups on the area’s age profile can be seen in Figure 3.6. As time continues, the large “boomer” population will be entering their senior years, while the size of college-aged population (identified here as ages 18 to 30) is expected to remain relatively static. These trends have implications for transportation planning. For instance, those identified as “Millennials” (born between 1980 and 2000) are showing increasing demand for ride-sharing, public transit, and non-motorized options, while the increasing number of seniors may also translate into increased demand for more “walkable” environments and more transit service. Whatever the preferences may be, an increasing percentage of the area’s population will likely be needing transportation assistance in coming years. Projections based on those done by the Minnesota State Demographer’s Office for St. Louis County show that those aged 75 and older will approach 20% of the population by the year 2040 (Figure 3.7).

Figure 3.5: Duluth-Superior Population Pyramid (2010)



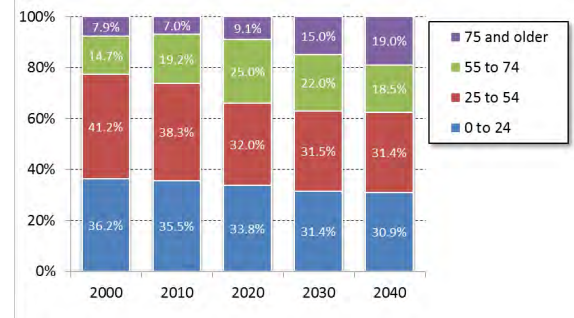
Source: U.S. Census Bureau, 2010.

Figure 3.6: Age profile of the MIC area: 2000 and 2010



Source: U.S. Census Bureau, 2010.

Figure 3.7: Projected change in age profile: MIC area (2000 to 2040)



Source: MIC (2014).

Race

The Duluth-Superior metropolitan area is not very racially diverse, compared to many other metro areas throughout the country. The area’s population is predominately Caucasian (Figure 3.10), and those identified as Hispanic or Latino represent only 1% of that subset (Figure 3.11).

There are signs, however, that the Duluth-Superior metro is becoming more racially diverse. For instance, in 2010, Whites represented 92% of the population, as opposed to 94% a decade earlier, while the numbers of African American residents and those of multiple races have been increasing (Table 3.5). In addition, it has been reported that 5% of the area’s population speaks a language other than English at home (Figure 3.12).

Table 3.5: Changes in % race (2000-2010)

Area	Population subset 2000	% of Pop.	Population subset 2010	% of Pop.
Caucasian	136,373	93.9	135,565	91.8
Two or more races	2,342	1.6	3,960	2.7
African American	1,686	1.2	2,688	1.8
American Indian or Alaskan Native	3,028	2.1	3,182	2.2
Asian American	1,316	0.9	1,805	1.2
Some other race	372	0.3	383	0.3

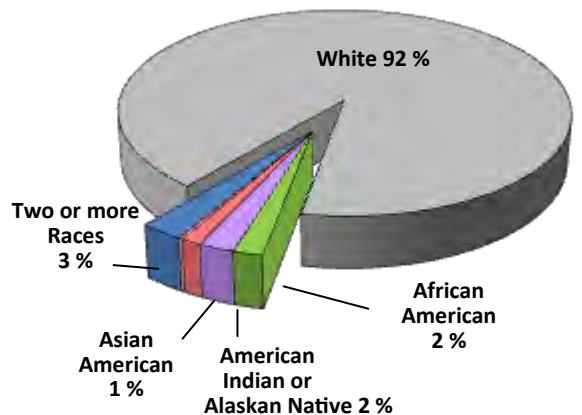
Sources: U.S. Census Bureau, 2010.

Considerations of race, ethnicity, and language are important in the planning and provision of transportation services. These populations have historically been underserved by public transportation policy and have had limited or no input into major transportation decisions that have significantly impacted their neighborhoods.

These considerations fall under “Environmental Justice” (EJ), which is the public policy goal of ensuring that low-income or minority populations do not bear disproportionately high, or negative impacts as a result of government activities - which includes publicly funded transportation projects. The transportation projects that are identified in *Connections 2040* have undergone a preliminary EJ assessment, which can be found in Chapter 5 of CONNECTIONS 2040.

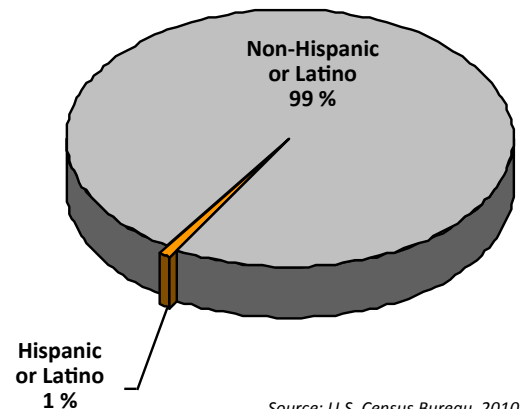
Map 3.3 (following page) shows the census blocks in the MIC area where concentrations of minorities exceed both the metropolitan average of 8.2% and the national average of 27.6% (Census 2010) . The largest concentrations exist in Duluth’s Central Hillside neighborhood near the downtown, which also represents a high

Figure 3.10: Population by Race (2010)



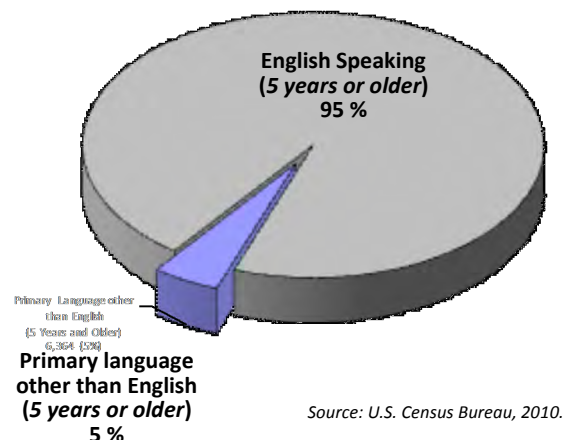
Source: U.S. Census Bureau, 2010.

Figure 3.11: Hispanic or Latino Population (2010)



Source: U.S. Census Bureau, 2010.

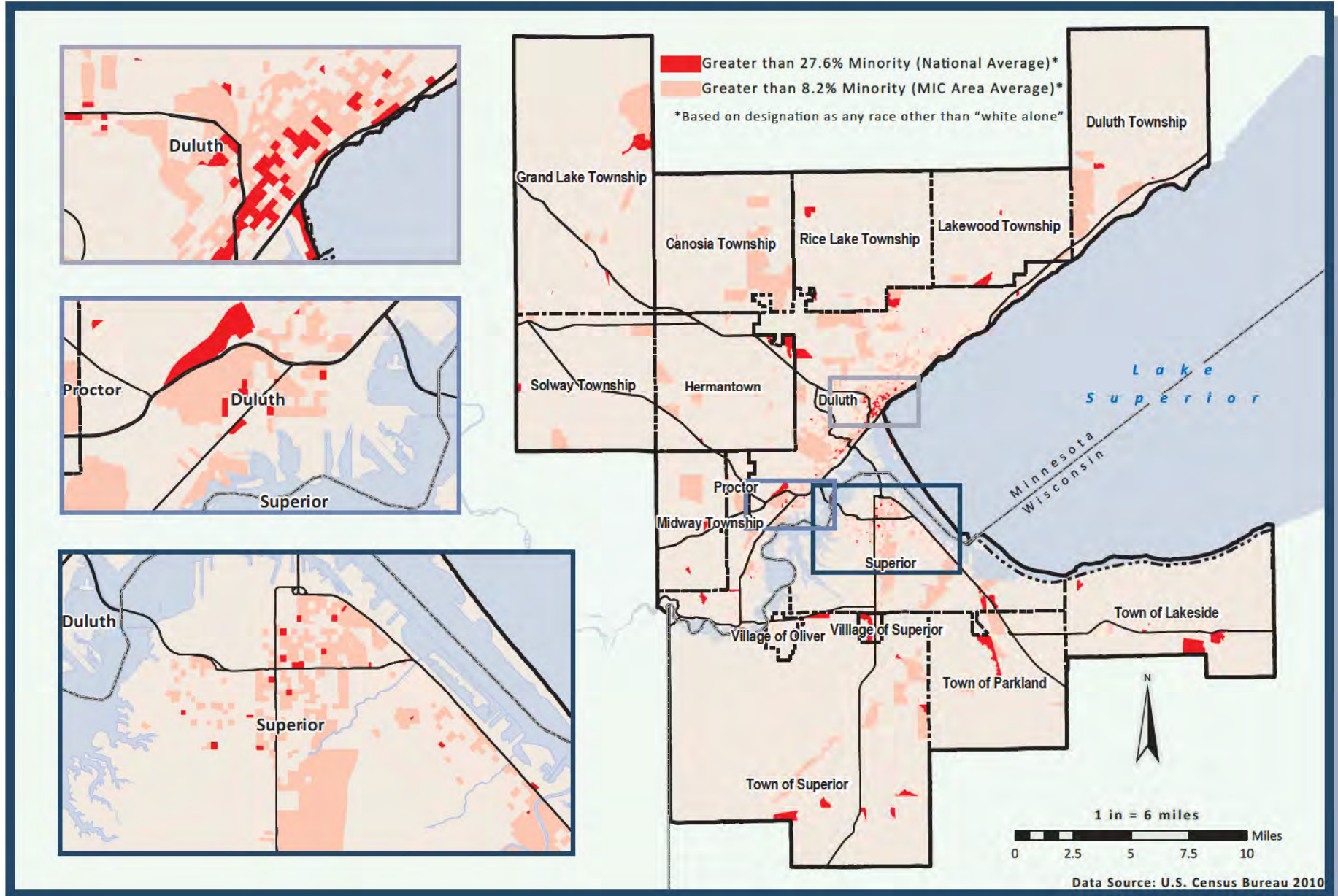
Figure 3.12: Non-English Speaking Population (2010)



Source: U.S. Census Bureau, 2010.



Duluth - Superior Minority Populations



Map 3.3

concentration of people living below the national poverty line.

Poverty

The most recent estimates from the U.S. Census Bureau show that 18% of the MIC area’s population is living below the national poverty line (Figure 3.13). This represents a four percent increase from the 2000 Census, of which the City of Duluth has experienced the largest addition of those living in poverty (Table 3.6).

Table 3.6: Change in % Poverty in the MIC area (2000-2010)

Area	Individuals in poverty (2000)	% of Area Pop.	Individuals in poverty 2010 *	% of Area Pop.
Duluth	13,472	9.3	17,591	12.6
Superior	3,667	2.5	4,338	3.1
Surrounding areas	1,542	1.1	2,294	1.6

* 5-year estimate 2008-2012

Sources: U.S. Census Bureau, Census 2000 and 2008-2012 5-Year ACS data (2014)

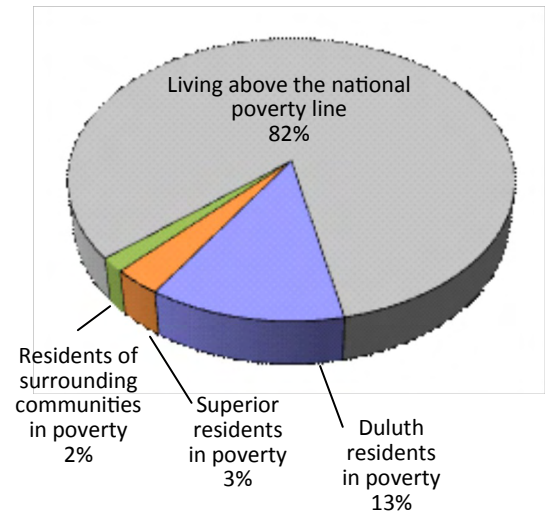
People living in poverty often face transportation challenges. They often lack the means to transport themselves to/from work and other destinations and have difficulty accessing jobs and services. Often they are reliant on public transit or other services that do not always provide the flexibility they need to effectively chain different trips together (work, daycare, medical, shopping, etc.).

Areas of concentrated poverty, therefore, are important to consider in the planning and provision of transportation services. Efforts should be made to tailor transportation projects in ways that improve access and mobility for low-income individuals and families.

Map 3.4 on the following page shows that the highest concentrations of individuals living in poverty in the area are near the downtown districts of Duluth and Superior, the Central Hillside and Lincoln Park neighborhoods of Duluth, as well as Duluth’s university district (full-time students are included in the low-income subset). It is important to note that significant distances (two miles in Superior, and greater than four in Duluth) exist between these concentrations and the area’s major retail centers, which represent the greatest number of low-skilled or entry level employment opportunities in the area.

Map 3.4 was also used in the preliminary Environmental Justice (EJ) analysis to determine which of the planned transportation projects on pages 5-12 through 5-30 may impact areas of concentrated poverty in the Duluth-Superior metropolitan area.

Figure 3.13: Percent Duluth-Superior



Source: U.S. Census Bureau, 2010.

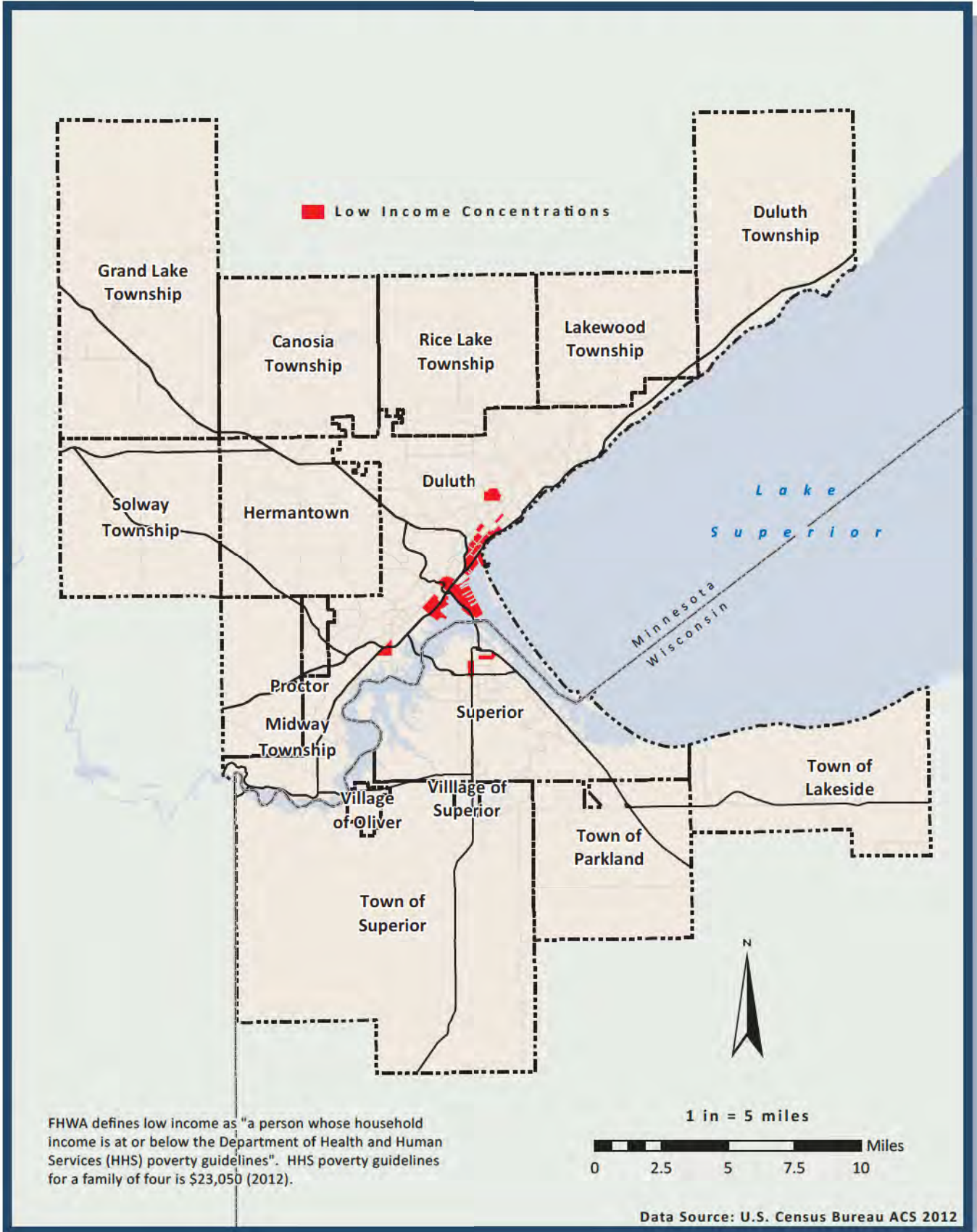
Is Duluth-Superior’s population of those living in poverty bigger than reported?

The federal government’s method of counting those who are living in poverty is under increasing scrutiny as alternative methods, such as those recently proposed by the National Academy of Sciences (NAS), attempt to factor in rising costs of health care, child care, and transportation, and would suggest an even greater percentage of the MIC area’s population is encountering the challenges of poverty on a daily basis.



Duluth - Superior

Low Income Concentration



FHWA defines low income as "a person whose household income is at or below the Department of Health and Human Services (HHS) poverty guidelines". HHS poverty guidelines for a family of four is \$23,050 (2012).

Ambulatory Difficulty

The U.S. Census Bureau defines ambulatory difficulty as those who have “serious difficulty walking or climbing stairs.” This subset of the population is important to consider in transportation planning as they represent those with potentially greater mobility needs both in terms of services and infrastructure design.

It is estimated that 3% of the MIC area’s population have ambulatory difficulty. This is lower than the national average of 3.2%. Some municipalities, however, have estimates that are above the national average (see Table 3.7), and when looking at individual census tracts in the metro, the percent of people with ambulatory difficulty is estimated to be as high as 12% (Map 3.5 on the following page).

As people age, their ambulatory abilities begin to decline. As would be expected then, those over age 65 represent a greater percentage of those facing ambulatory difficulty. As Table 3.7 shows, this subset of the Duluth-Superior population has a level of ambulatory difficulty that is nearly 5 times larger than the population overall.



Members of the population aged 65 and over represent a higher percentage of those with ambulatory difficulty.

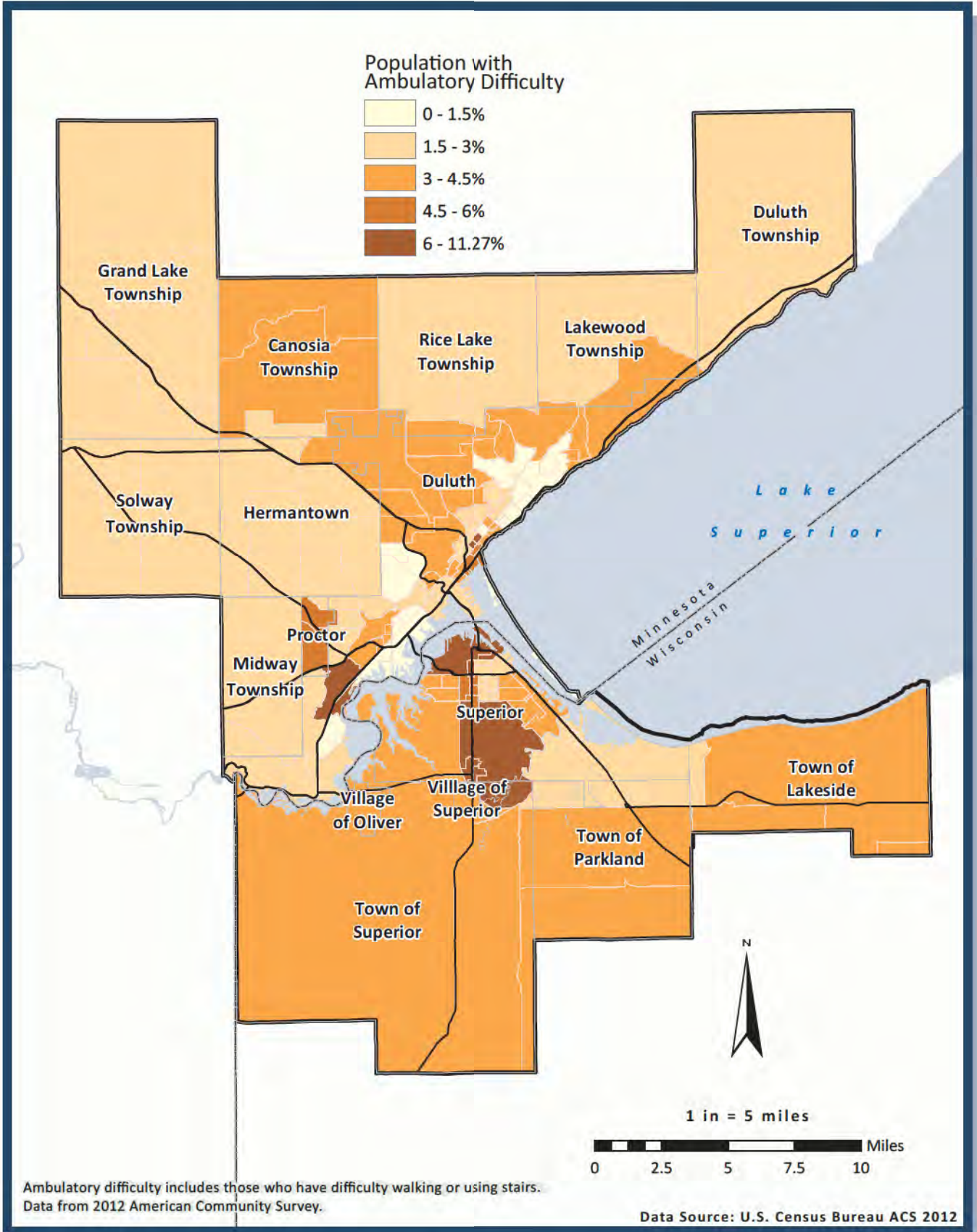
Table 3.7: Estimates of those with ambulatory difficulty in the Duluth-Superior metropolitan area

Area	Population estimate (ages 5 and over) 2008 - 2012	People with an ambulatory difficulty	% ambulatory difficulty	Ages 65 and over	Ages 65 and over with ambulatory difficulty	% ambulatory difficulty
MIC (MN)	106,255	2,760	2.6%	21,032	3,106	14.8%
Duluth	79,720	2,067	2.6%	16,503	2,338	14.2%
Hermantown	8,226	145	1.8%	1,572	366	23.3%
Proctor	2,843	121	4.3%	627	93	14.8%
Rice Lake T.	3,880	77	2.0%	525	56	10.7%
Grand Lake T.	2,477	36	1.5%	402	68	16.9%
Lakewood T.	2,076	44	2.1%	263	27	10.3%
Canosia T.	2,018	152	7.5%	281	56	19.9%
Solway T.	1,911	37	1.9%	260	33	12.7%
Duluth T.	1,717	44	2.6%	254	38	15.0%
Midway T.	1,387	37	2.7%	345	31	9.0%
MIC (WI)	29,755	1,265	4.3%	5,892	850	14.4%
Superior	25,044	1,118	4.5%	5,092	705	13.8%
T. of Superior	1,920	28	1.5%	336	36	10.7%
T. of Parkland	1,257	42	3.3%	187	28	15.0%
T. of Lakeside	642	28	4.4%	98	17	17.3%
V. of Superior	580	43	7.4%	144	57	39.6%
V. of Oliver	312	6	1.9%	35	7	20.0%
TOTAL MIC AREA	136,010	4,025	3.0%	26,924	3,956	14.7%

Source: US Census Bureau, ACS 5-year estimates (2008-2012), 2014.

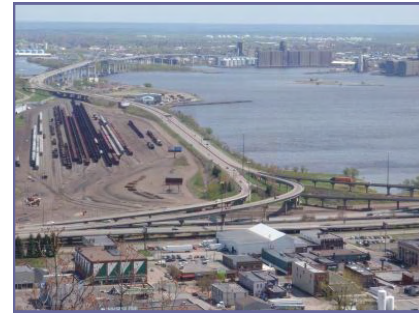


Duluth - Superior Ambulatory Difficulty



THE ECONOMY & EMPLOYMENT

Trend: The Duluth-Superior metropolitan area is expected to grow in its capacity as a regional trade center, with significant job growth anticipated to occur within the cities of Duluth, Hermantown, and Superior.



The Blatnik Bridge on US Hwy 53 connects Duluth, MN (foreground) and Superior, WI

The Regional Economy

The Duluth-Superior metropolitan area is the regional trade center (RTC) for Northeast Minnesota and Northwest Wisconsin. It offers a wealth of opportunities for employment, shopping, tourism, trade, education, healthcare and other services. It is also a major transportation hub for the movement of commodities and other freight throughout the region, nation, and internationally - especially because of its port facilities. Because of the concentration of economic activities and transport, the Duluth-Superior metro drives regional productivity.

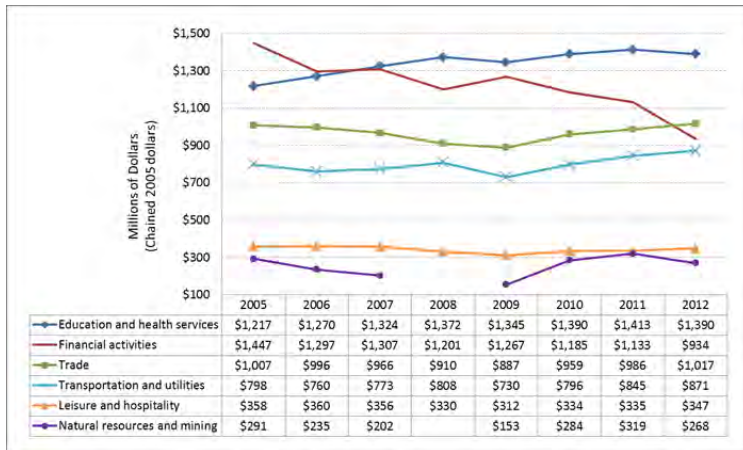
As Figure 3.12 shows, in terms of real gross domestic product (GDP), the productivity of the MSA has tracked fairly closely with that of the Twin Cities and the State of Minnesota at large. In 2012, however, real GDP for the MSA was \$142 million, which contained virtually no growth from the previous year. This appears to be the result of a tightening financial industry in the region, which has been showing decline since the global economic crisis of 2008 and 2009 and is having a dampening effect on the increasing productivity of the region's other prominent industries. This is illustrated in Figure 3.13 on the following page.

Figure 3.12: Comparison of GDP trends (All Industries total - indexed)



Source: U.S. Bureau of Economic Analysis, 2014.

Figure 3.13:
Real GDP of prominent industries in the Duluth-Superior MSA



Source: U.S. Bureau of Economic Analysis, 2014.

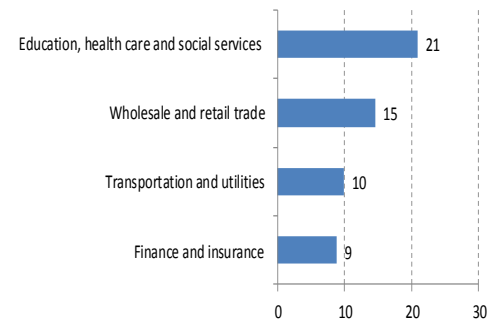
As Figure 3.13 shows, despite the decreasing GDP of the area's financial sector, other prominent industries are showing signs of economic vitality. The Education and Health Services industries continue to be the biggest contributors to the area's productivity, while the Trade, Transportation, and Utilities industries have been increasing in productivity. And, as Figure 3.14 shows, these sectors have a potentially more significant impact on employment in the area, employing more people per \$100 million in GDP than the finance and insurance sector. The growth of these industries in the region helps to explain an unemployment rate in the Duluth-Superior MSA that is decreasing significantly faster than the national unemployment rate (Figure 3.15).

Employment Trends

While the activities of many businesses result in freight traffic on the area's roads, rails, airways, and waterways, the greatest impacts to the transportation system come from the many more numbers of employees and customers that businesses attract. That is why consideration is given in this plan for the numbers and types of jobs that are located throughout the Duluth-Superior metropolitan area. Different types of jobs tend to be associated with different levels of customer activity, and so the types and locations of jobs in an area can also help to understand the patterns of traffic related to shopping and services.

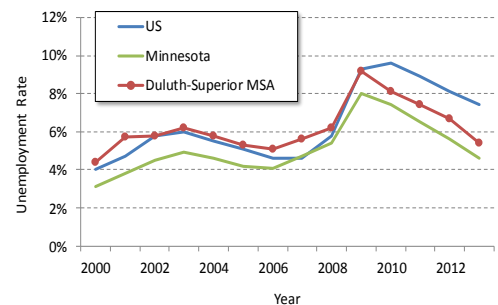
According to data available through the Bureau of Labor statistics, total employment in the Duluth-Superior metropolitan statistical area (MSA) was estimated to be 122,000 jobs in 2012. More than

Figure 3.14:
Jobs per \$1 million in real GDP
(average for all MSAs: 2010 to 2012)



Source: U.S. Bureau of Labor Statistics, 2014.

Figure 3.15:
Comparison of unemployment trends



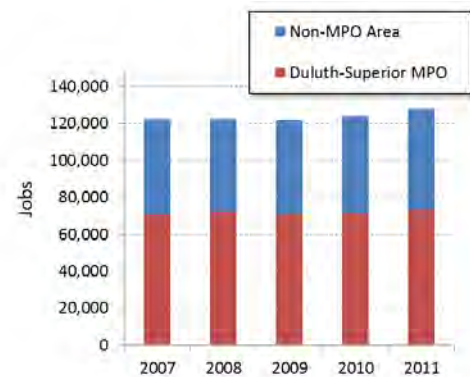
Source: U.S. Bureau of Labor Statistics, 2014.

half of these Jobs are within the Duluth-Superior MPO, as is shown in Figure 3.16.

The MPO had accounted for around 58% of the region’s jobs between 2007 and 2011, and that approximately 5,000 jobs were added to the region during that time. Of all the jobs in the MPO, 97% are contained within the urbanized area (UZA) of the cities of Duluth, Hermantown, Proctor, and Superior, and the villages of Oliver and Superior.

Figures 3.17 and 3.18 below show the employment profile of the Duluth-Superior urbanized area, coded according to the North American Industry Classification System (NAICS). Over 88% of the area’s jobs are considered service-producing jobs and include the sectors associated with five of the area’s six prominent industries previously discussed (Healthcare and education, Financial activities, trade, Leisure and hospitality, and Transportation and utilities). Together, these sectors account for more than 54,000 employees in the area.

Figure 3.16: Total jobs in the Duluth-Superior MSA (2007 to 2011)



Source: U.S. Census Bureau, LEHD, 2014.

Figure 3.17: Service-Providing Employment (Duluth-Superior MPO area)

Five of the area’s most productive industry sectors (Health care and education, trade, leisure and hospitality, financial activities, transportation and utilities) account for 74% of all the jobs within the MPO area, employing more than 54,000 people.

Source: U.S. Census Bureau, LEHD, 2014.

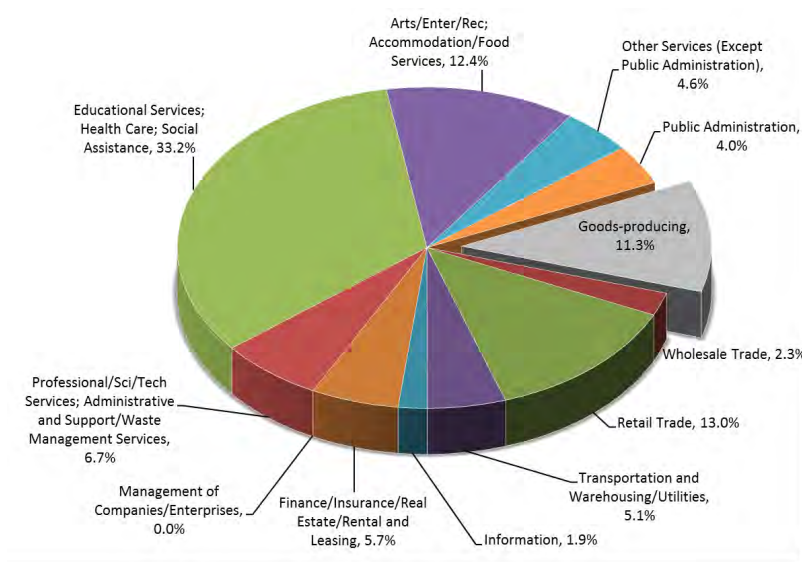
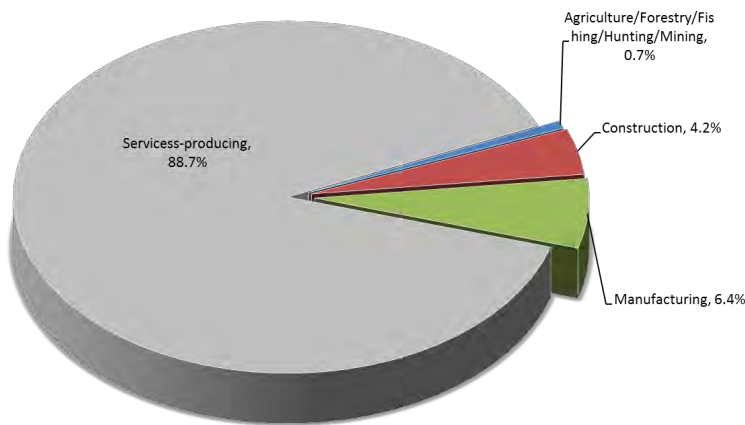


Figure 3.18: Goods-Producing Employment (Duluth-Superior MPO area)

Goods-producing jobs account for about 11% of the Duluth-Superior employment. This equates to more than 8,000 jobs, more than half of which are in manufacturing.

Source: U.S. Census Bureau, LEHD, 2014.

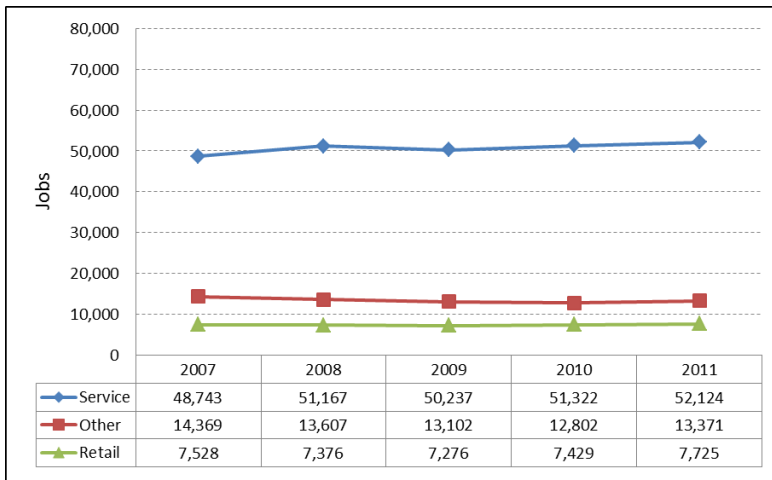


Goods producing jobs account for 11.3% of the jobs within the metro area. These include jobs in Agriculture, forestry, fishing, hunting and mining, as well as construction and manufacturing jobs. Together, these jobs employ approximately 8,300 people in the area.

Traditionally, it has been understood that retail jobs, service jobs, and other types of jobs tend to generate different levels of employee and customer traffic. Thus, the jobs shown in Figure 3.17 and 3.18 on the page 3-17 were further organized according to the categories shown in Table 3.8 below and are represented in Figure 3.19 at right.

Between 2007 and 2011, the total number of jobs in the area has remained relatively stable, rebounding from losses it experienced in the global crisis of 2008 and 2009. During this time, the three categories remained basically proportional to each other, with the "Other" category losing approximately 1,000 jobs, but the "Service" category gaining more than 3,300 jobs.

Figure 3.20:
Number of jobs by category in the MIC Area (2007-2011)

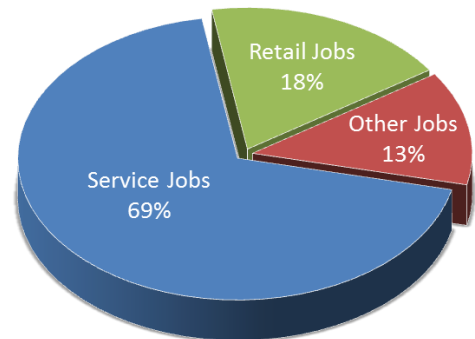


Source: U.S. Census Bureau, LEHD, 2014.

Employment Projections

The three job categories described above, their relative proportions, and rates of growth were all considered in estimating future employment for the Duluth-Superior area. Two employment projections were developed that correspond to the conservative and aggressive growth scenarios modeled for population growth. The results of these projections are described here, while the process of using them in future travel demand modeling is explained in more detail on pages 3-30 through 3-35.

Figure 3.19:
Jobs in the Duluth-Superior UZA according to "retail", "service", and "other" categories (2012).



Source: U.S. Census Bureau, LEHD, 2014.

Table 3.8: Organization of job types by "Retail", "Service", and "Other" categories.

Job Category	NAICS Code	Job Types
Retail	44-45	Retail Trade
Service	71	Arts, Entertainment, and Recreation
	72	Accommodation and Food Service
	48-49	Transportation and Warehousing
	51	Information
	52	Finance and Insurance
	53	Real Estate and Rental Leasing
	54	Professional, Scientific, and Technical Services
	55	Management of companies and Enterprises
	56	Administrative, Support, Waste Management and Remediation Services
	61	Educational Services
	62	Health Care and Social Assistance
81	Other Services [Except Public Administration]	
Other	11	Agriculture, Forestry, Fishing and Hunting
	21	Mining, Quarrying, and Oil and Gas Extraction
	22	Utilities
	23	Construction
	31-33	Manufacturing
	42	Wholesale Trade
	92	Public Administration

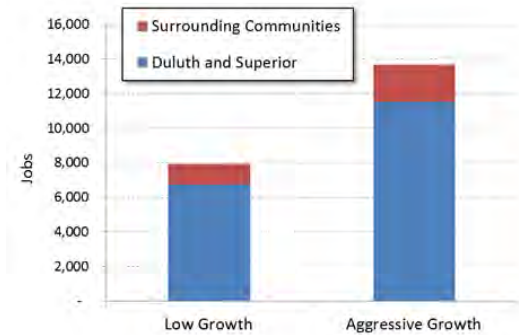
Under the conservative growth scenario, employment in the Duluth-Superior metropolitan area is estimated to grow by 11% to 79,496 jobs. This rate of growth is comparable to that projected by the Minnesota Department of Employment and Economic Development (DEED) for the entire northeast region of Minnesota and represents a reasonable estimate for growth, given the existing demographic and economic trends throughout the region.

A rate of growth of 19% was modeled for the aggressive growth scenario. This results in a total of 85,000 jobs in the MIC area by the year 2040, exceeding the conservative projection by 4,580 jobs. The employment projections of both scenarios are displayed in Table 3.7.

Once the growth scenarios were developed, staff at the MIC sat down with officials from the various jurisdictions within the area to identify where each municipality was planning future business growth to occur. Table 3.9 shows how the projected job numbers were allocated among the municipalities as the results of this process, and Figure 3.21 illustrates the proportion of jobs distributed between the major cities of Duluth and Superior and the surrounding communities under the two future scenarios.

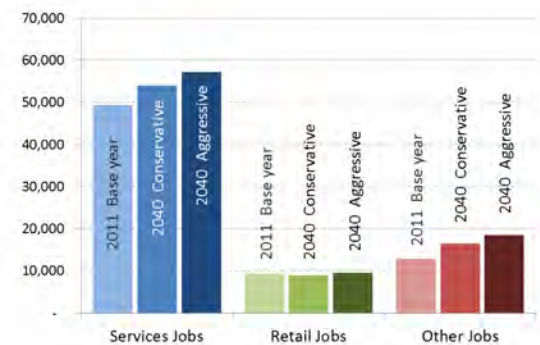
The types of jobs in the area are likely to change in ways that cannot be anticipated at present. However, the relative proportions of those job types are not expected to change dramatically. Figure 3.22 compares the estimated changes in the numbers of service, retail, and other jobs under the different growth scenarios. From that illustration, it can be seen that the growth in retail jobs is estimated to be negligible. This reflects an anticipated continuation of retail sales moving on-line, with those jobs making up 2% less of the area’s employment in 2040. By contrast, jobs in the “other” category are expected to make up 4% more of the area’s jobs. This reflects a level of growth in manufacturing jobs that the economic development initiatives of a number of the area’s municipalities are calling for.

Figure 3.21:
2040 Job growth scenarios modeled for the MIC area.



Source: MIC Travel demand model (2014).

Figure 3.22:
Comparison of projected job growth by type in the MIC area.



Source: MIC Travel demand model (2014).

Table 3.9: Employment projections for the Duluth-Superior metropolitan area (2010 to 2040)

Area	2010	2040 Projection		Total Change (30 years)			
		Conservative	Aggressive	Cons.	% Change	Aggr.	% Change
MIC (MN)	62,890	68,882	73,462	5,992	9.53%	10,572	16.8%
Duluth	55,747	60,423	64,075	4,676	8.4%	8,328	14.9%
Hermantown	4,035	4,949	5,414	914	22.7%	1,379	34.2%
Proctor	1,147	1,195	1,262	48	4.2%	115	10.0%
Townships (MN Side)	1,961	2,315	2,711	354	18.1%	750	38.2%
MIC (WI)	8,663	10,614	11,771	1,951	22.5%	3,108	35.9%
Superior	8,320	9,880	10,890	1,560	18.8%	2,570	30.9%
Villages and towns (WI Side)	343	734	881	391	114.0%	538	156.9%
TOTAL MIC AREA	71,553	79,496	85,233	7,943	11.1%	13,680	19.1%

Source: URS Corp, 2014.

LAND USE & TRANSPORTATION DEMAND PATTERNS

Trend: More people are moving farther away from the area's concentrations of employment and commercial activities. The result is that more vehicle miles are being traveled throughout the area. There are some signs of increasing demand for other modes of transportation.

The preceding pages have presented information regarding trends in the numbers, types, and densities of people and jobs within the Duluth-Superior metropolitan planning area. These are important considerations for transportation planning for a variety of reasons, but trends in land use and travel behavior are also important to consider. Land use and transportation are inextricably linked; trends occurring in one generally influence patterns of the other. The demand for different modes of transportation can similarly influence the provision of transportation services and patterns of land development. This dynamic relationship makes it necessary to coordinate the planning of transportation improvements in the metro area with land use planning of the individual municipalities and vice-versa. The following pages describe these trends in the Duluth-Superior area.

Land Use Patterns

The shape and size of the Duluth-Superior area and its land uses are the result of the economic and industrial activities that have gathered around its harbors over time. The area's patterns of land-use today largely remain that way; industrial activities are still concentrated near the ports, and employment and services are still concentrated in nearby central business districts. Over the past several decades, however, more of the area's population and commercial activities have migrated further from the central cities. As the urban boundary has expanded, large concentrations of commercial activity - such as the Miller Hill Mall - have developed farther away from the largest concentrations of people. Map 3.6 on the following page, shows the concentrations high-density residential areas relative to concentrations of commercial and industrial activities.

Development in the Duluth-Superior metro continues to expand beyond the urbanized area. Signs of this can be seen in the population and employment estimates from the U.S. Census Bureau; changes in the number of jobs and employees in the core cities versus the surrounding communities suggest a metropolitan area that is getting larger but becoming less dense (Figure 3.23).

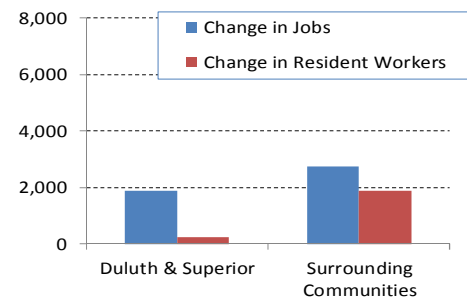


US Highway 53 in Duluth

Travel patterns influenced by land uses

- Local travel to jobs, services, and shopping
- Regional commuter traffic
- Movements of freight
- Seasonal traffic (e.g. holidays, tourism)

Figure 3.23: Changes in Jobs and working-aged People living and working in the MIC area: 2006 to 2010.

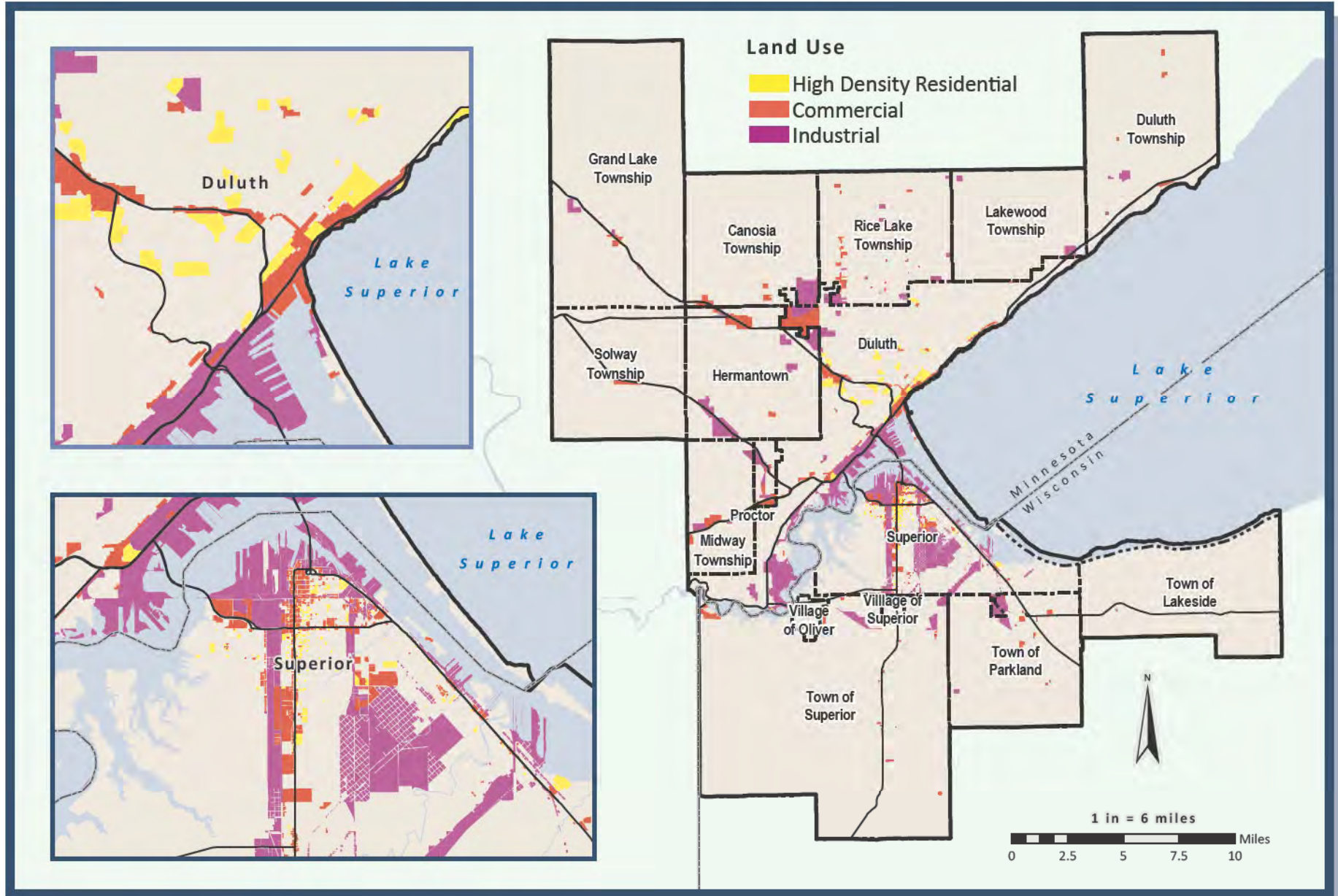


Source: US Census Bureau, LED Origin-Destination Data Base (2014).



Duluth - Superior

Land Use Concentrations



Map 3.6

While the trend of spreading out of development is typical of most metropolitan areas, the pattern seems more noteworthy for the Duluth-Superior area when comparing its population density to those of U.S. metro areas of similar size (Figure 3.24).

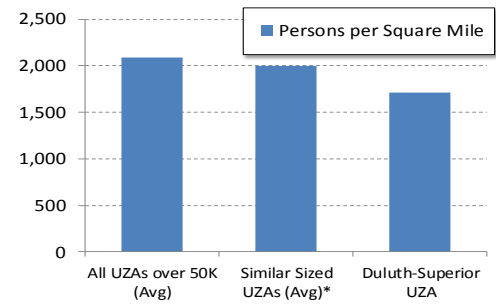
Being a metro area with lower-than-average density implies accompanying trends of higher-than-average consumption of energy and resources. As the distances between population, commercial centers, jobs, and services become greater, they require greater extensions of infrastructure and service networks, and result in longer travel times.

Local Travel Patterns

Travel times have been getting longer in the Duluth-Superior area. This can be seen in the *Travel-Time-to-Work* data provided by the Census Bureau, which shows that, while the majority of residents have commute times under 20 minutes (Figure 3.25), commute times have been getting longer in the population overall. For example, those with commutes of less than 15 minutes have decreased from 44% to 41% of the population between the years 2000 and 2010 (Figure 3.26).

The majority of this increased travel is occurring as additional single-occupancy automobile trips. It is estimated that 87% of the working population in the Duluth-Superior area drive to work alone, while 9% carpool, and 9% travel to work by some other means (see Figure 3.27 on the following page).

Figure 3.24:
Comparison of urban area population densities



Source: FHWA Statistical Highway Series (2013).

* metropolitan areas of similar population size to the Duluth-Superior UZA (range: 110,000 to 130,000 people; n=37).

Figure 3.25:
Travel time to work: Duluth-Superior metropolitan area
Source: U.S. Census Bureau: Census 2000; 2008-2012 ACS.

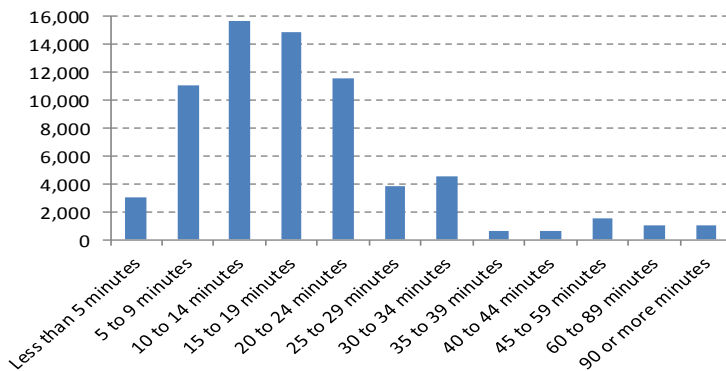
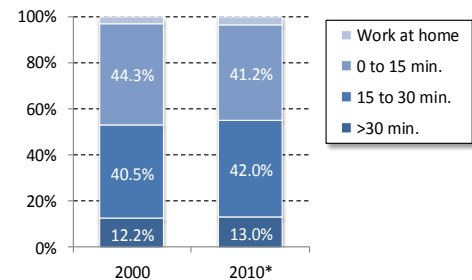


Figure 3.26:
Change in metro population's travel times to work (2000 to 2010).



Source: U.S. Census Bureau: Census 2000; 2008-2012 ACS.

* ACS 5-Year estimate.,

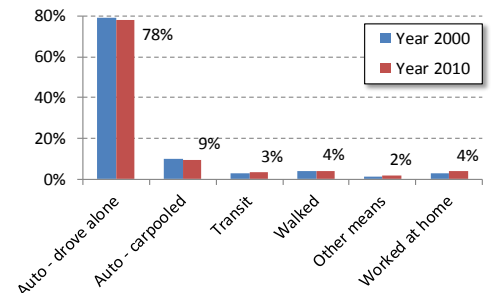
It is interesting to note in Figure 3.27 that a slight shift in people’s travel choices has also occurred in the area since 2000. The percentage of those traveling to work by automobile decreased by 2%, while those working from home or traveling by “other means” each increased one percentage point. This shift is consistent with trends known to be occurring throughout the country: increased telecommuting and an increased bike commuting.

Nevertheless, the majority of travel in the area still occurs in the form of automobile trips, and it is understood that this travel is occurring primarily as two distinct mass movements of vehicles throughout the area - a few hours in the morning and a few hours in the afternoon. These are times when the area’s transportation system is most congested and the efficiency of traffic operations at various locations throughout the network are most challenged.

The overall amount of automobile travel in the area, however, appears to be holding steady. As Figure 3.28 shows, the number of total miles traveled by vehicles on an average day, or vehicle-miles-traveled (VMT), has remained roughly the same over the past decade for both the tri-county MSA and the Duluth-Superior urbanized area. This is consistent with VMT trends observed at both the state and national levels over the same period.

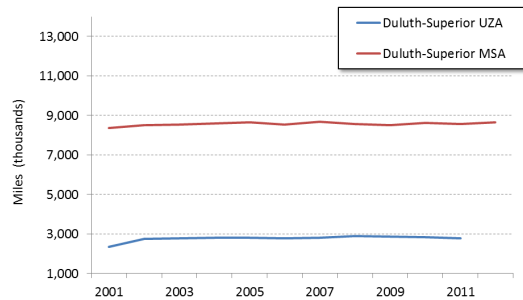
When looking more closely at VMT in the urbanized area versus the larger MSA, however, some differences are noticed in their trend lines. Despite being relatively flat, the VMT for both geographies has been increasing slightly. For the MSA, daily travel has been trending upward by 0.1% every year (Figure 3.29), while VMT for the urban area has been averaging a 0.3% increase per year (Figure 3.30). With that said, VMT in the urbanized area has been decreasing consecutively, year after year, since 2008.

Figure 3.27:
Means of travel to work: Duluth-Superior metro



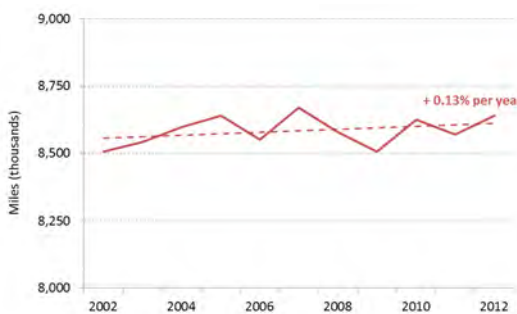
Source: U.S Census Bureau: 2008-2012 ACS (2014).

Figure 3.28:
Daily vehicle-miles-traveled (VMT): 2001 to 2012



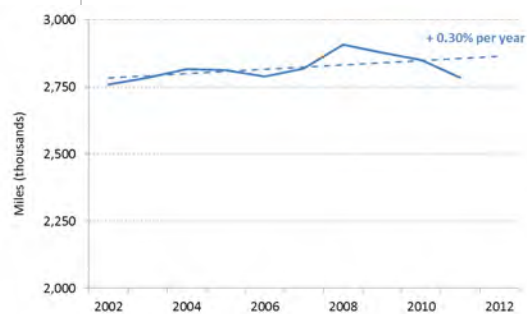
Source: FHWA Highway Statistics Series (2104); MnDOT Roadway Data (2014).

Figure 3.29:
Daily vehicle-miles-traveled (VMT) in the Duluth-Superior MSA: 2002 to 2012



Source: MnDOT Roadway Data (2014).

Figure 3.30:
Daily vehicle-miles-traveled (VMT) in the Duluth-Superior UZA: 2002 to 2012



Source: FHWA Highway Statistics Series (2104)

Local Demand for Other Modes of Transportation

While growth in vehicle travel demand in the area appears modest, there are signs of growing demand for other forms of transportation in the area. The usage of public transit, in particular, has grown by 20% over the recent decade, serving 547,000 more riders in 2013 than in 2004. When comparing the most recently available data regarding passenger miles traveled (PMT) with overall vehicle miles traveled (VMT) in the urbanized area, transit usage appears to be increasing in contrast to a decreasing VMT (Figure 3.31 and Figure 3.32).

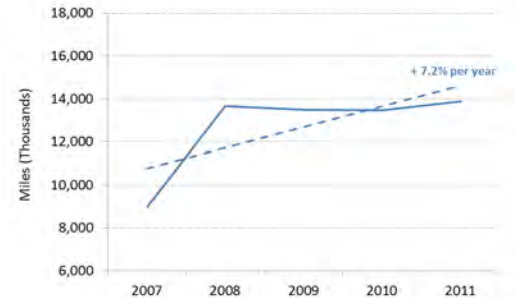
There are signs that the use of other modes in the Duluth-Superior area are on the rise too. Each DTA bus is equipped with front-end bike racks year-round and, as with passengers, the DTA also counts the numbers of bikes it transports. This data can be considered as somewhat of a proxy measure for non-motorized transportation demand in the area. It shows that between the first year of data collection (2006) and 2012, the annual number of bikes on buses increased by more than 14,000 trips – an average annual increase of 14% (Figure 3.33). This trend was reversed in 2013, which staff at the DTA has speculated was the result of a combination of a longer-than-average winter, more inclement weather days, and new housing opportunities opening up near college campuses in the area.

While the demand for walking and biking in the Duluth-Superior area is not something that can presently be measured system wide, there is anecdotal evidence of increasing demand. For instance, cyclists appear to be more present – especially in non-summer months - in and around downtown Duluth and Superior.



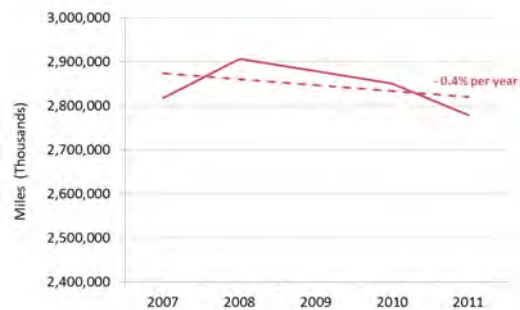
Cyclist placing bike on DTA bus

Figure 3.31:
Annual passenger revenue miles (PMT) in the Duluth-Superior UZA: DTA Regular Route service (2007 to 2011)



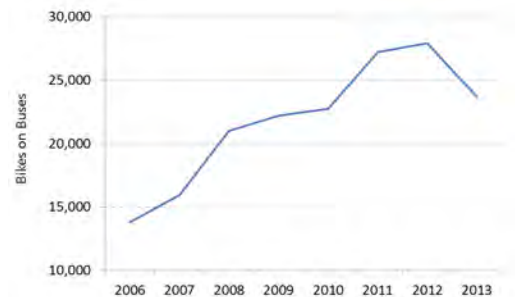
Source: FTA National Transit Database (2014).

Figure 3.32:
Annual vehicle miles traveled (VMT) in the Duluth-Superior UZA (2007 to 2011)



Source: FHWA Statistical Highway Series (2013).

Figure 3.33:
Annual bikes transported on DTA buses



Source: Duluth Transit Authority (2014).

Demand for Transportation Assistance

There are members of the Duluth-Superior community that face transportation challenges due to poverty or to mental or physical disabilities. The transportation needs of some of these individuals are being met with a combination of the DTA's regular route bus service, paratransit (aka "dial-a-ride" service), and volunteer driver services funded through regional agencies.

There are some signals that the demand for transportation assistance is increasing in the Duluth-Superior metro. The DTA has reported the number of clients registered to use the DTA's paratransit service, STRIDE, has increased in recent years. While the levels of use the service experiences can vary significantly from year to year, the trend line suggests there has been a 0.3% increase in the use of STRIDE since 2004 (Figure 3.34).

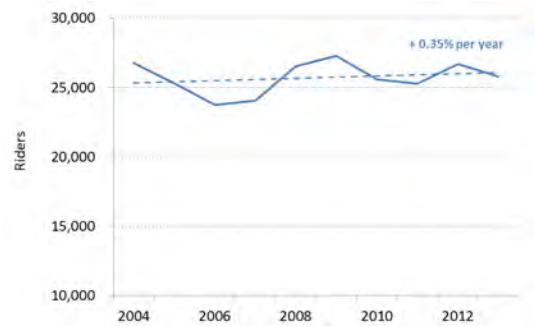
Other programs that provide transportation assistance in the area have also experienced increases in usage. The Assisted Transportation program administered by the Arrowhead Agency on Aging (AAA) provides mileage-reimbursement for volunteers who provide rides to seniors, principally for medical appointments. Use of this program has followed a trend line that is equivalent to a 20% annual increase in use since 2003 (Figure 3.35). Though this data is for the entire Arrowhead region, staff at the AAA contend that a similar rate of increased use is occurring in the Duluth area as well.

The Arrowhead Economic Opportunity Agency (AEOA) provides a similar mileage-reimbursement program for volunteers for individuals on public assistance in Lake County, Koochiching County, and St. Louis County in Minnesota. This program is the outcome of a recent convergence of smaller programs, and so AEOA does not have data that can fairly outline trends in usage, but AEOA does report providing an average of 3,000 trips per month in these counties.



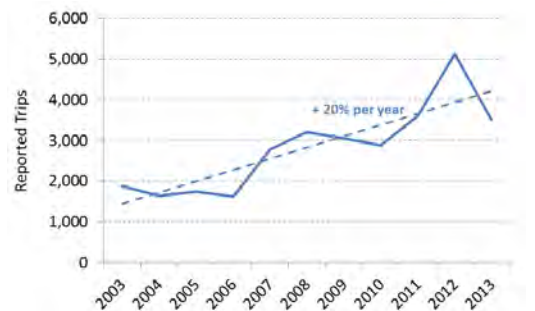
Wheelchair user accessing medical appointment by using the STRIDE service.

Figure 3.34:
Annual DTA ridership: STRIDE service



Source: Duluth Transit Authority (2014).

Figure 3.35:
Increase in annual 1st Quarter trip reimbursements administered by AAA in the Arrowhead Region



Source: Arrowhead Agency on Aging (2014).

Regional Travel Demand Patterns

Being the regional trade center (RTC) of Northeast Minnesota and Northwest Wisconsin, the Duluth-Superior area attracts regional traffic related commerce, both in terms of the transfer of freight and the commutes of workers who live beyond its boundaries. Data regarding freight movements is generally proprietary and difficult to track, but data regarding the location of workers' homes and jobs shows slight increases in the numbers and distances of people commuting into the area for work.

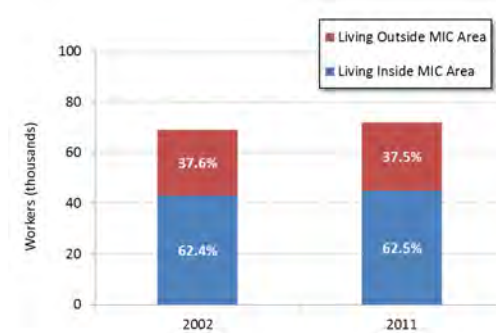
The Census Bureau's Longitudinal Employment-Household Dynamics (LEHD) data is one of the most comprehensive datasets available regarding employment and worker flow. The data is drawn from state unemployment insurance (UI) earnings records that provides a link between home location and job location. In some cases, the UI records may link employees to a payroll location they do not actually commute to. It is for this reason that, upon review, the MIC planning staff estimates the LEHD employee count for the Duluth-Superior area is overrepresented by 12%. Once this is adjusted for, the data shows that 27,000 people are potentially commuting into the area for work on a daily basis, while 11,800 people are commuting outside the area 2011 (see Table 3.10).

The LEHD data also shows that employment in the area grew by more than 3,000 jobs between 2002 and 2011 and that nearly two-thirds of that growth (1,930) went to people living within the metropolitan boundary. The other 1,704 jobs were additional people commuting into the area. This ratio of new resident to non-resident workers is roughly equivalent to the distribution that already existed in the area, which shows that 37% of the area's jobs are held by people living outside of the Duluth-Superior metro (Figure 3.36).



Duluth and Superior attract a significant amount of commercial and employment-related traffic from outside the metro area

Figure 3.36: Jobs in the MIC area according to where workers live (2011).



Source: U.S Census Bureau, LEHD (2014).

Table 3.10: Changes in the numbers of MIC area workers living in inside and outside the MIC area (2002-2011)

Person Characteristic	2002 LEHD	Adjusted	% Share	2011 LEHD	Adjusted	% Share	Change
	Count	12%		Count	12%		
Employed in the MIC area	78,488	69,069	100.0%	81,901	72,073	100.0%	3,003
Employed in the MIC area but living outside	29,488	25,949	37.6%	30,708	27,023	37.5%	1,074
Employed and living in the MIC area	49,000	43,120	62.4%	51,193	45,050	62.5%	1,930
Living in the MIC area	62,253	54,783	100.0%	64,658	56,899	100.0%	2,116
Living in the MIC area but employed outside	13,253	11,663	21.3%	13,465	11,849	20.8%	187
Living and employed in the MIC area	49,000	43,120	78.7%	51,193	45,050	79.2%	1,930

Source: U.S Census Bureau, LEHD (2014), adjusted by MIC.

The LEHD *On the Map* web application also shows the proportion of employment-based commuter traffic by distance and direction. From this information, the overall pattern of regional traffic to and from the Duluth-Superior metropolitan area can be seen, and it becomes apparent that much of the long-distance commuting to and from Duluth-Superior is moving along the I-35 corridor, followed by travel south into Wisconsin (Figure 3.37).

Figure 3.38 indicates that more people are now traveling longer distances to access jobs in the area. It shows that the number of people commuting between 25 and 50 miles grew by 4.4%, while the number of people traveling more than 50 miles may have grown by as much as 7.5%. It also shows that substantially more commuter traffic is occurring from communities that are 10 to 25 miles west and northwest of the area. This is a pattern that is consistent with population increases in townships adjacent to the MIC planning area and in Carlton County to the west.

The increased commuter traffic to the area is consistent with increases in the average annual daily traffic (AADT) on regional corridors at the area’s boundary. As seen in Table 3.11 below, many of the key corridors experienced approximately a 10% increase in their *annual average daily traffic* (AADT) between 2003 and 2011. The geographic locations of these increases can be seen in Map 3.7 on the following page.

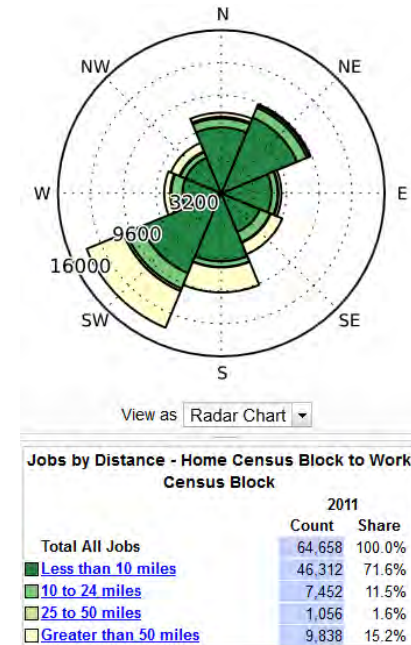
Despite the general increase in traffic at the MIC boundary, one important regional corridor stands out as an exception: Interstate 35. Between 2003 and 2011, I-35 experienced a 12% decrease in daily traffic. This is likely the result of many factors; impacts of the recent economic downturn of 2008 and 2009, increasing gas prices, and large-scale construction projects in 2010 and 2011 likely all suppressed non-work, interregional travel (such as tourism) on I-35. This trend is expected to be reversed in coming years.

Table 3.11: Increases in daily traffic at MIC boundary (2003-2011)

Roadway	2003 AADT*	2007 AADT*	2011 AADT*	%Change 2003-2011
A. Interstate 35	28,900	27,600	25,400	-12%
B. WI State Trunk Hwy 35	1,650	1,700	1,800	9%
C. US Trunk Hwy 2/53	12,680	13,700	13,900	10%
D. US Trunk Hwy 53	7,100	7,900	7,900	11%
E. US Trunk Hwy 2	4,750	4,600	5,100	7%
F. MN State Trunk Hwy 61	6,900	7,600	7,600 </td <td>10%</td>	10%

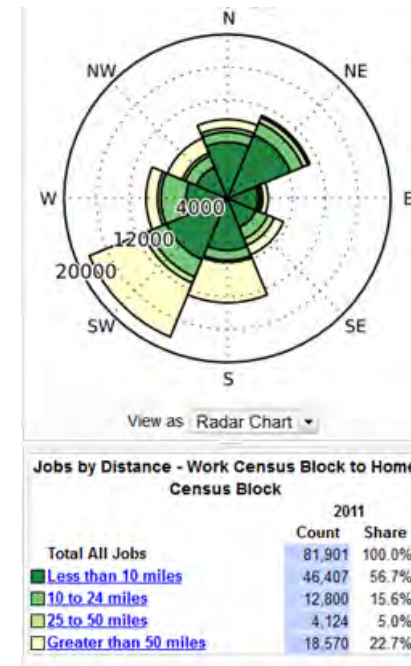
Sources: Minnesota Department of Transportation and Wisconsin Department of Transportation, 2014.

Figure 3.37: Distance and direction of workers travel to/from the MIC area to their jobs (2002).



Source: U.S Census Bureau, LEHD On the Map (2014).

Figure 3.38: Distance and direction of workers travel to/from the MIC area to their jobs (2011).

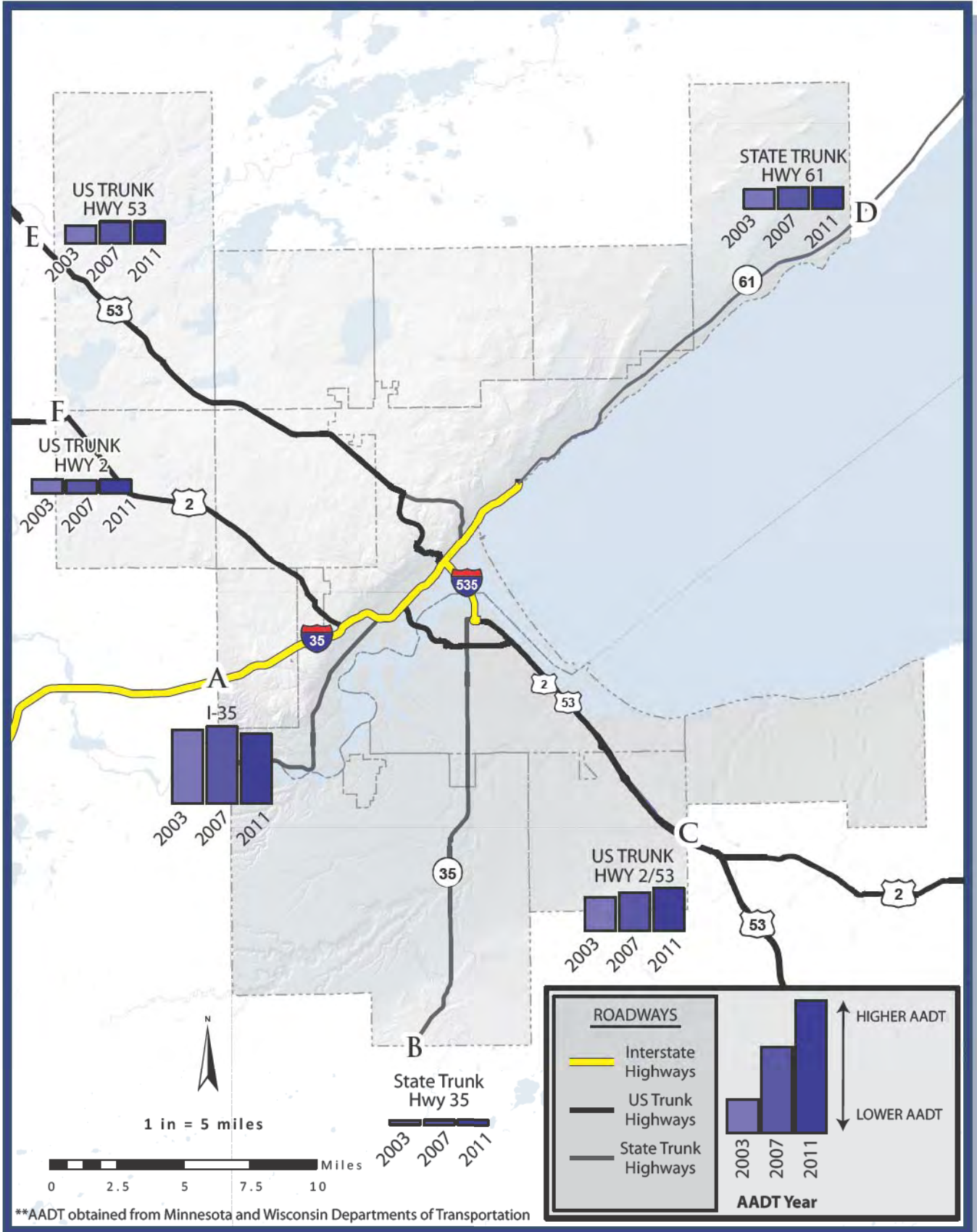


Source: U.S Census Bureau, LEHD On the Map (2014).



Duluth - Superior

AADT - Major Corridors on MIC Boundary



**AADT obtained from Minnesota and Wisconsin Departments of Transportation

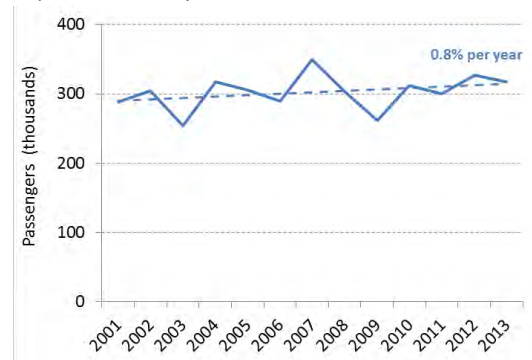
Demand for Other Modes: Air, Rail, and Water

In addition to the regional traffic facilitated by the area’s network of highways and roads, Duluth-Superior is also home to major transportation facilities that serve interregional air, rail, and waterborne transportation. The area has three major airports of regional significance for passenger service, freight movements, and recreational flying: the Duluth International Airport (DLH), the Richard I. Bong Municipal Airport (SUW), and Duluth’s Sky Harbor Airport (DYT). The SUW and DYT airports facilitate more than 19,000 and 13,000 flight operations a year, and – despite facing competition from the larger Minneapolis-St. Paul International Airport (MSP) - DLH served 28,900 more in passengers in 2013 than it did in 2001, trending at an average 0.8% annual increase over that period (Figure 3.39).

An extensive network of railways exists in and around Duluth-Superior. More than 40% of rail crossings on the Minnesota side of the MIC area and more than 50% on the Wisconsin side experience more than five train movements per day (Figure 3.40). At present, all such movements are exclusively freight trips, as passenger rail service to the area ended in 1980, but there has been increasing efforts in recent years to study the feasibility and demand potential for creating a high-speed rail connection between Duluth-Superior and St. Paul, Minnesota. A marketing study is currently underway, and MnDOT’s Office of Passenger Rail is modeling the potential ridership attraction of a select number of station locations.

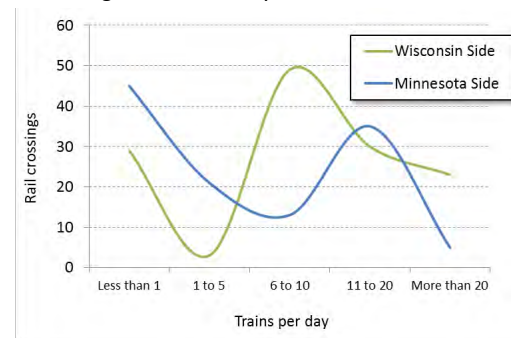
The Duluth-Superior port is are the largest Great Lakes’ port for bulk commodities, shipping an average 38 million tons annually. As with the other major ports on the Great Lakes, the Duluth-Superior port has experienced decreases in the amount of freight moving through it; total tonnage decreased 12% between 2001 and 2011. Nevertheless, the port has continued to facilitate significantly more tonnage than the other Great Lakes ports (Figure 3.41). Up to 100 foreign ships call on the Duluth-Superior port each year bringing imports such as steel, wind energy components and manufactured heavy equipment and return overseas with grain. On intermittent years, cruise ships carrying passengers have visited the area, and the MIC has worked with the Duluth Port Authority to study the feasibility of establishing a cruise ship docking facility to grow the cruise ship industry while also meeting federal security requirements.

Figure 3.39:
Annual passenger enplanements at DLH (2001 to 2013)



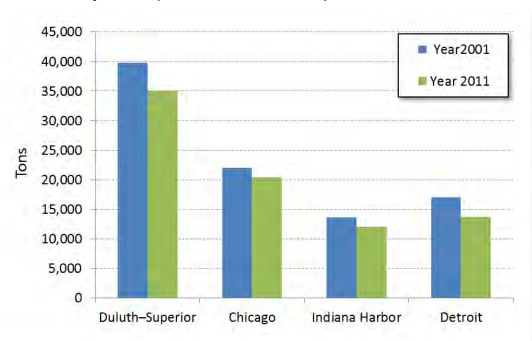
Source: Duluth International Airport (2014).

Figure 3.40:
Average daily train movements at rail crossings in Duluth-Superior



Source: Federal Rail Administration (2014).

Figure 3.41:
Annual tonnage moving through major Great Lakes ports (2001 and 2011)



Source: Federal Rail Administration (2014).

MODELING FUTURE TRAVEL DEMAND

Trend: Increases in households and employment are projected to lead to significant increases in traffic in some areas. Some key corridors will approach capacity over the next 25 years and will require planning and investments to mitigate congestion.

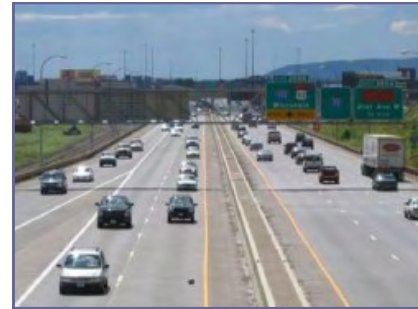
The MIC models both current and future transportation demand in Duluth-Superior using a mix of traffic volume and socioeconomic data. As part of *Connections 2040*, the existing model was updated to reflect Census 2010 information as well as changes to the road network that have occurred since 2009. This information was then used to model the impacts of the changes in both population and employment as are being projected under the two growth scenarios discussed on pages 3.7 and 3-19.

Levels of population and employment cannot tell the story alone. Information regarding trends in household sizes, job types, and land use patterns were used to help identify where increases in populations and jobs will most likely be occurring in the area. For this purpose, the planning staff at the MIC met with officials from the various municipalities and jurisdictions in the area to help allocate projected population and employment to the different transportation analysis zones (TAZs) in the model. Map 3.8 and Map 3.9 on the following pages illustrate how increases in households and jobs are being allocated under the conservative and aggressive growth scenarios.

The allocation of future households and jobs, as well as projected school enrollment, were all inputs into the transportation demand model, which was then used to predict the volumes and paths of future traffic on the area’s road network under both growth scenarios. The model produced outputs in the form of predicted future volumes, vehicles-to-capacity (V/C) ratios, and estimated levels of service (LOS) for each of the road links represented in the model. LOS is a description of the levels of traffic that one would experience as they are traveling on a certain road (see Figure 3.42).

Figure 3.42: Levels of Service Descriptions

Level of Service	Description
A	FREE FLOW. Low volumes and no delays.
B	STABLE FLOW. Speeds restricted by travel conditions, minor delays.
C	STABLE FLOW. Speeds and maneuverability closely controlled due to traffic volumes.
D	STABLE FLOW. Speeds considerably affected by change in operating conditions. High-density traffic restricts
E	UNSTABLE FLOW. Low speeds, considerable delay, volume slightly over capacity.
F	FORCED FLOW. Very low speeds, volumes exceed capacity, long delays with stop-and-go traffic.



Traffic on I-35 near downtown Duluth.

Modeling the Duluth-Superior Transportation Network based on TAZs:

Transportation demand modeling uses a set of computerized processes to predict changes in travel patterns in response to changes in demographics, development patterns, and the transportation network itself.

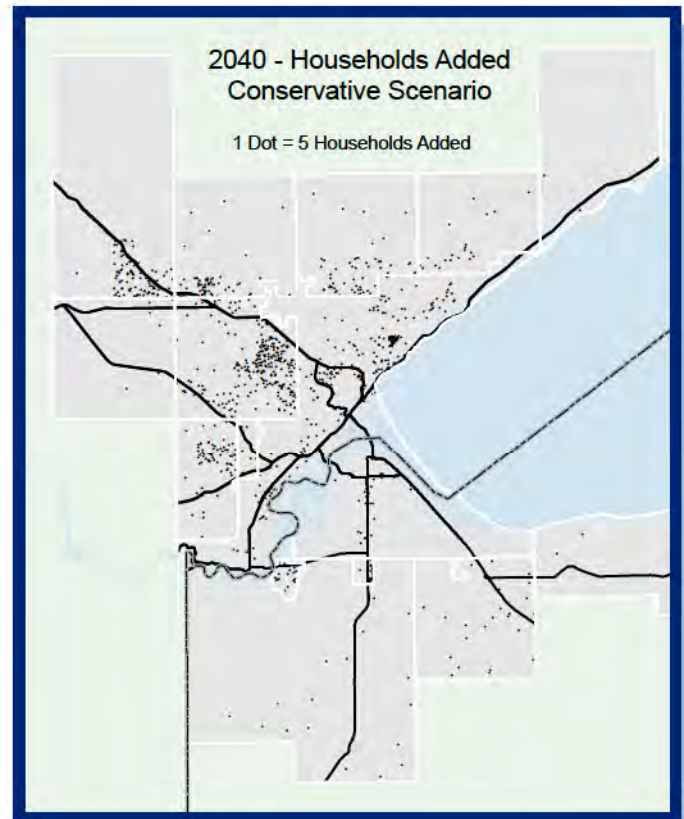
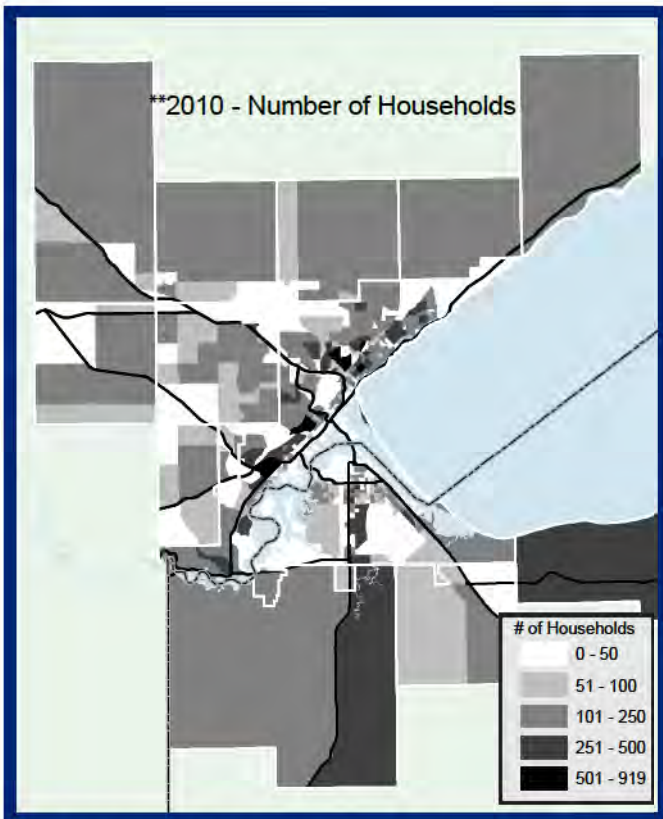
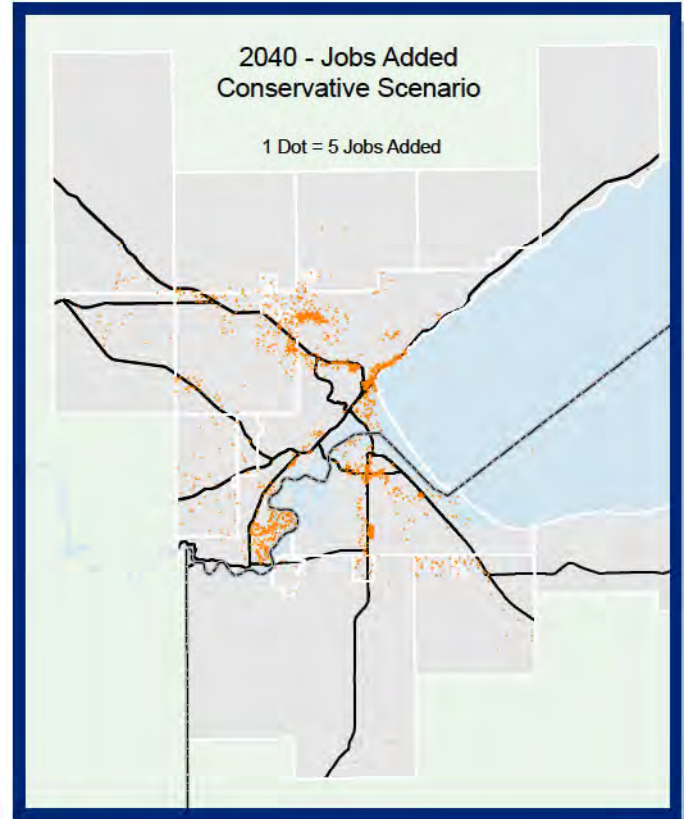
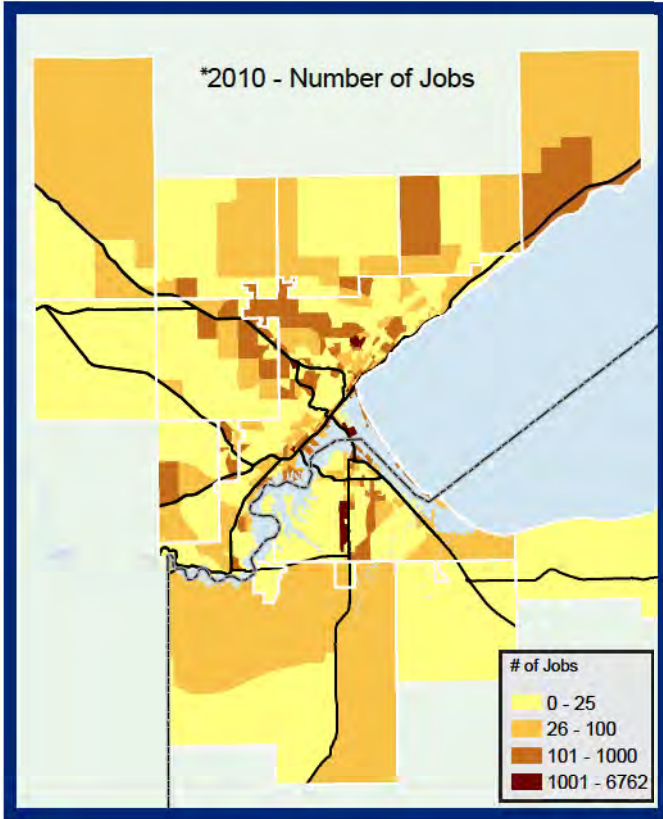
Describing capacity conditions with LOS:

The capacity of a network link is dependent on the assumed level of service (LOS). LOS is a vehicles-to-capacity ratio and is used to estimate the amount of delay on a network link.



Duluth - Superior

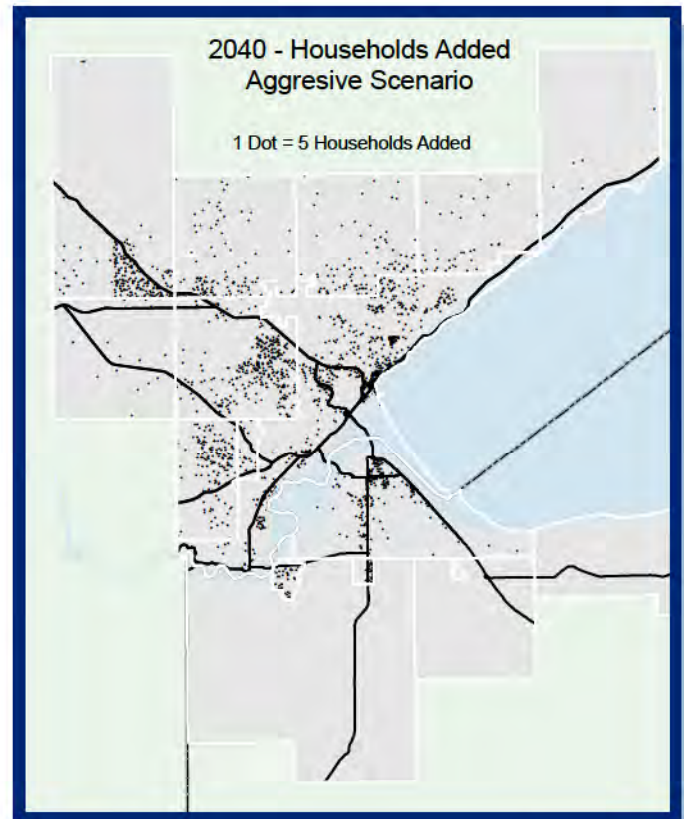
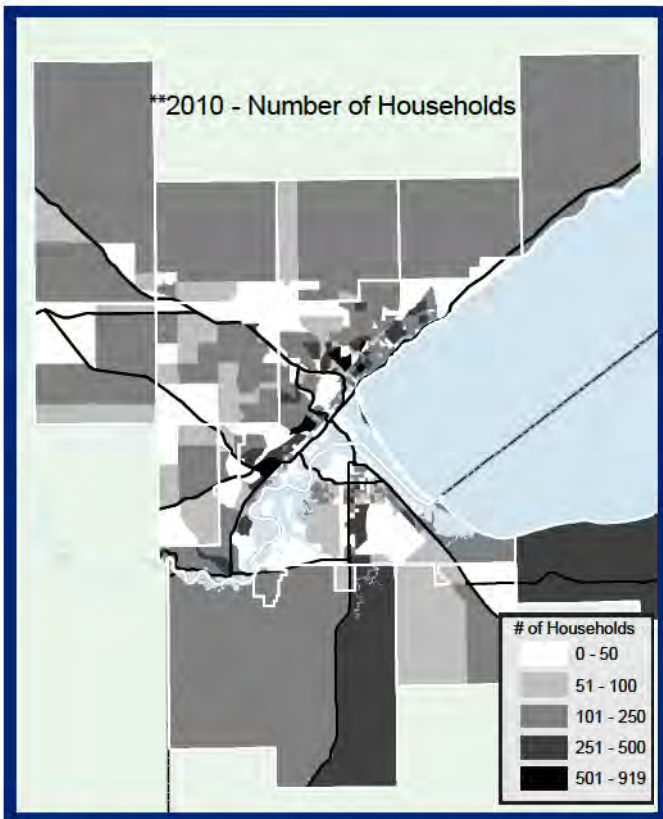
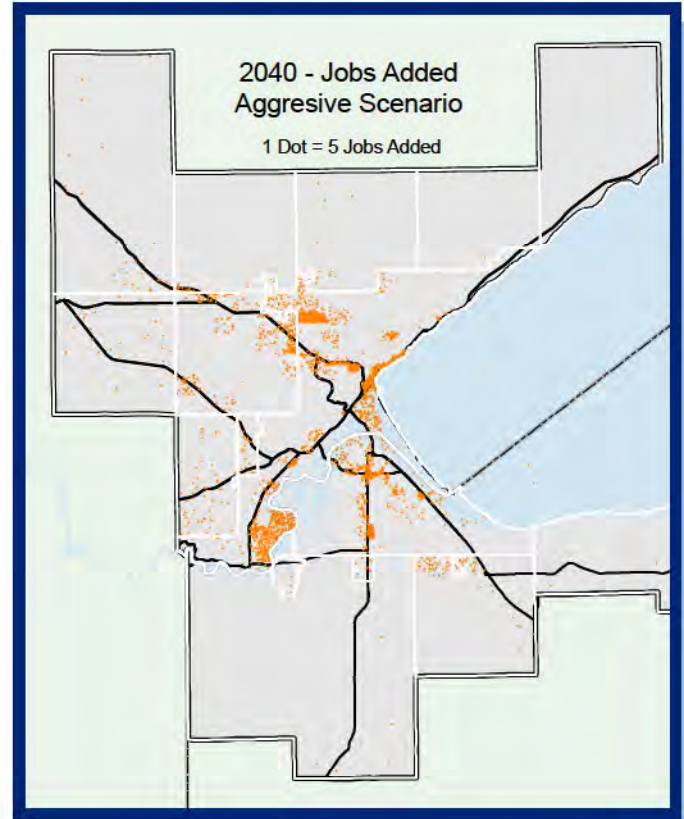
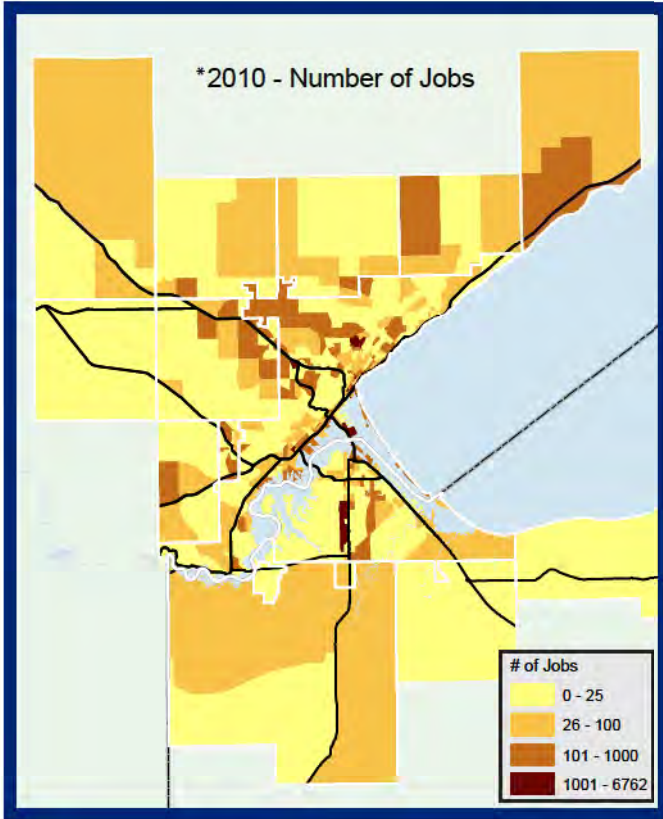
Model Inputs - Conservative



*Data from Census LEHD Origin-Destination Employment Statistics
Workplace Area Characteristics
**Data from 2010 Decennial Census



Duluth - Superior Model Inputs - Aggressive



*Data from Census LEHD Origin-Destination Employment Statistics
Workplace Area Characteristics
**Data from 2010 Decennial Census

Comparing Present and Future Conditions

When comparing the information in maps 3.8 and 3.9 on the previous pages, it is apparent that the majority of the area’s households and jobs will continue to be concentrated in the cities of Duluth and Superior. Both future scenarios, however, anticipate an expansion of population and employment into the surrounding communities. As Table 3.12 shows, the City of Duluth is projected to represent 2% to 3% less of the area’s jobs while surrounding communities increase a percent. Table 3.13 shows an even greater pattern of dispersion with respect to households. Figures 3.43 and 3.44 below illustrate these trends between 2010 and the 2040 aggressive growth scenario.

Table 3.12: Projected Increases in jobs

Area	2010 Jobs	% Share	2040 Jobs “Conservative” scenario	% Share	2040 Jobs “Aggressive” scenario	% Share
Duluth	55,747	77.9%	60,423	76.0%	64,075	75.2%
Superior	8,320	11.6%	9,880	12.4%	10,890	12.8%
Hermantown	4,035	5.6%	4,949	6.2%	5,414	6.4%
Proctor	1,147	1.6%	1,195	1.5%	1,262	1.5%
Surrounding communities	2,304	3.2%	3,051	3.8%	3,592	4.2%
TOTAL MIC AREA	71,553	100.0%	79,498	100.0%	85,233	100.0%

Source: MIC travel demand model (2014).

Table 3.13: Projected Increases in households

Area	2010 Jobs	% Share	2040 Households “Conservative” scenario	% Share	2040 Households “Aggressive” scenario	% Share
Duluth	38,673	60.6%	39,718	57.5%	42,618	56.4%
Superior	13,684	21.5%	12,538	18.1%	13,454	17.8%
Hermantown	3,681	5.8%	5,282	7.6%	5,640	7.5%
Proctor	1,316	2.1%	1,426	2.1%	1,470	1.9%
Surrounding communities	6,436	10.1%	11,565	16.7%	13,818	18.3%
TOTAL MIC AREA	63,790	100.0%	69,102	100.0%	75,529	100.0%

Source: MIC travel demand model (2014).

Figure 3.43: Distribution of households and jobs - 2010 model base year

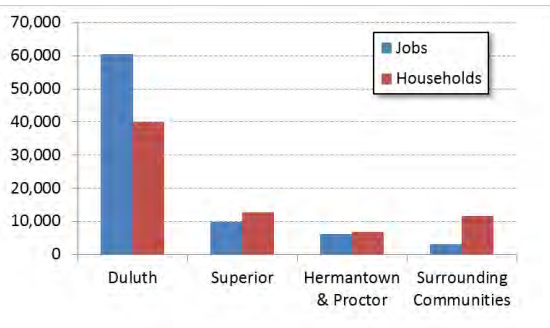
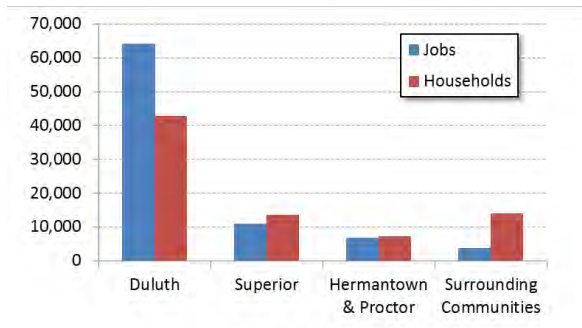


Figure 3.44: Distribution of households and jobs - 2040 “Aggressive” scenario



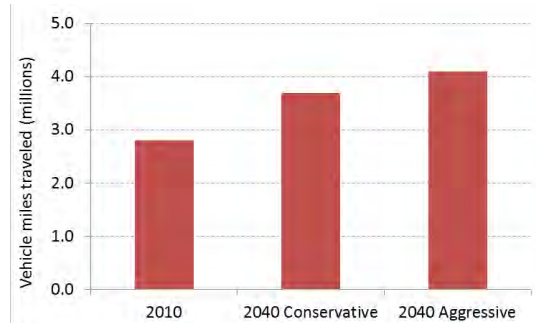
The general pattern of concentrating jobs in the urban center and an dispersing households further out from that center translates into greater trip distances and travel times between households, jobs, shopping, etc. The impacts of such land use changes in the MIC area were calculated with the travel demand model.

As Table 3.14 demonstrates, every type of trip, with the exception of those between households and schools (due to decreased levels of enrollment) are increasing by 9% under the conservative scenario and 19% under the aggressive growth scenario. This is estimated to amount to an additional 744,000 to 1.1 million vehicle-miles-traveled (VMT) per day in the area (Figure 3.45) and 21,800 to 31,000 more hours of travel (Table 3.15). Each mile, on average, would take approximately 6 seconds longer (conservative growth) to 14 seconds longer (aggressive growth) to travel in 2040. An average commute time of 20 minutes, for example, would become more than 24 minutes under the aggressive growth scenario.

The increased VMT and VHT would also equate to more fuel consumption and vehicle emissions. The FHWA has estimated an average fuel consumption of 21.4 miles-per-gallon per vehicle, and the EPA has estimated .00042 metric tons of greenhouse gases emitted per mile traveled (www.epa.gov/cleanenergy/energy-resources/refs.html). Based on these estimates, the MIC area could be consuming 18.6 million more gallons of gasoline and releasing 164,000 more metric tons of greenhouse gases into the atmosphere annually by 2040 (Figure 3.46).

Figure 3.45:

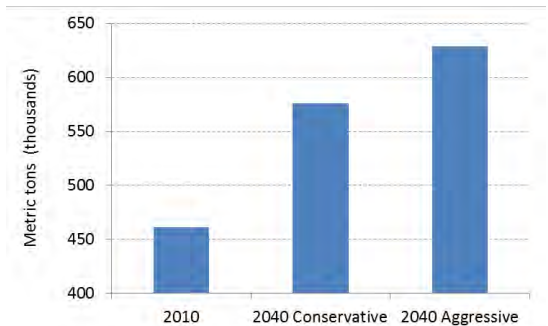
Daily vehicle-miles-traveled (VMT) estimates under three different modeled scenarios.



Source: MIC travel demand model (2014).

Figure 3.46:

Estimated annual greenhouse gas emissions from vehicles under three different modeled scenarios



Source: MIC (2014).

Table 3.14: Projected Increases in Trip Productions

Trip type	2010 daily trips	2040 daily trips "Conservative" scenario	% Change	2040 daily trips "Aggressive" scenario	% Change
Home-based work	89,599	97,389	9%	106,212	19%
Home-based shopping	90,130	98,133	9%	107,072	19%
Home-based School	89,412	86,496	-3%	93,014	4%
Home-based other	157,681	171,693	9%	187,277	19%
Non home-based	142,217	154,958	9%	169,082	19%
TOTAL	569,039	608,669	7%	662,657	16%

Source: Trip estimations from Duluth-Superior traffic demand model, 2014.

Table 3.15: Increase in Daily Miles and Hours Traveled

Scenario	VMT	% Change from 2010	VHT	% Change from 2010
2010 Base year	3,010,946		67,925	
2040 "Conservative"	3,755,722	24.7%	89,766	32.2%
2040 "Aggressive"	4,103,340	36.3%	98,962	45.7%

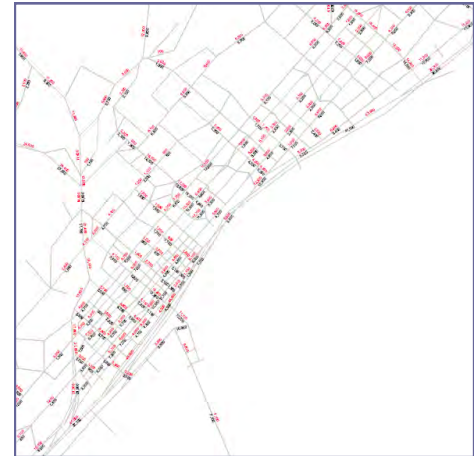
* VMT (vehicle miles traveled); VHT (vehicle hours traveled)

Source: Trip estimations from Duluth-Superior traffic demand model, 2014.

Future Deficiencies Identified in the Traffic Model

Where new households and jobs are located can cumulatively result in significant impacts to the operations of a transportation system. The MIC area travel demand model was thus used to identify where such issues might occur under the two growth scenarios being considered as part of this long-range plan.

All segments that the model identified as being at or beyond capacity now or in the future are listed in Table 3.16 below and also shown in Map 3.10 and Map 3.11 on the following pages. These are estimates based on basic daily volume parameters that are discussed in more detail in Appendix A of this plan. Conditions specific to each segment would require further study, but the model results do suggest that strategies should be considered for these segments to accommodate the potential future demand. Such strategies may include upgrading parallel facilities, managing demand through access control and other measures, increasing transit services, or even expanding the existing lane capacity, if necessary.



Screen shot of the MIC area travel demand model

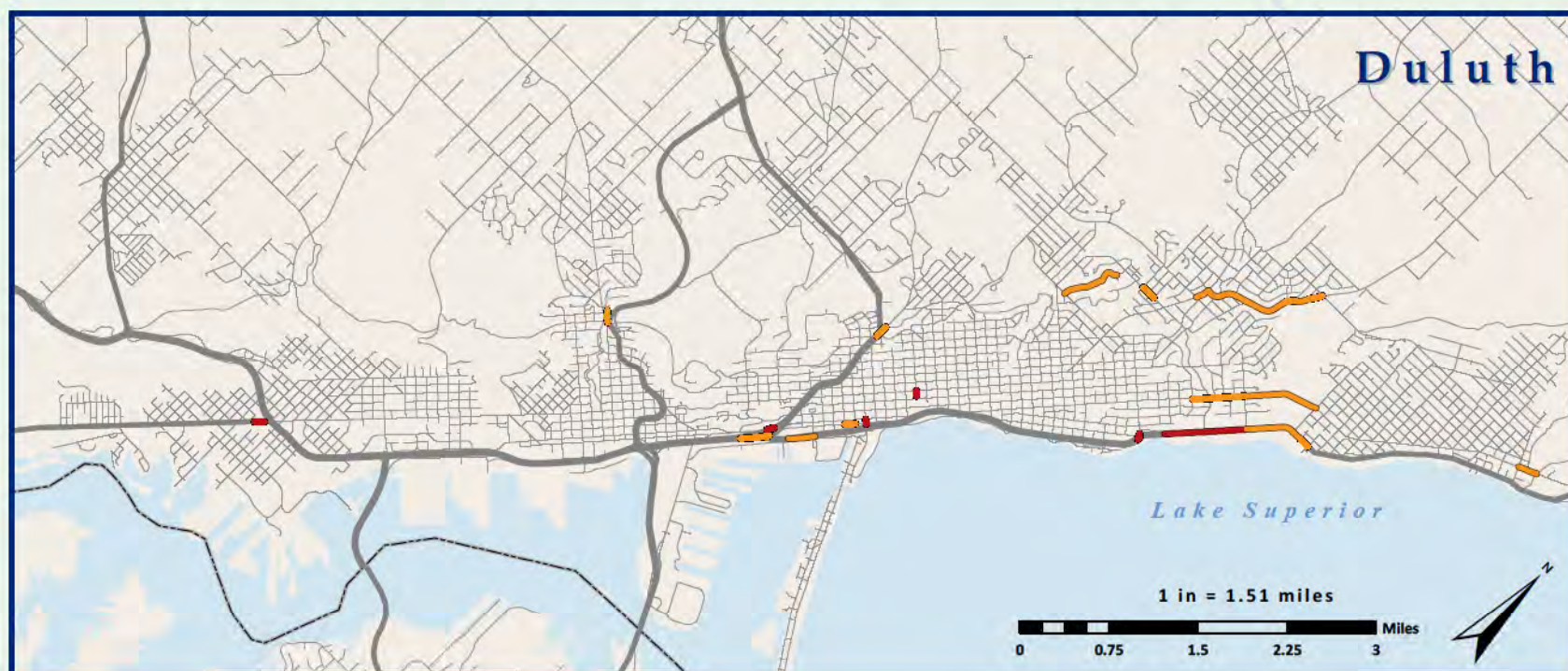
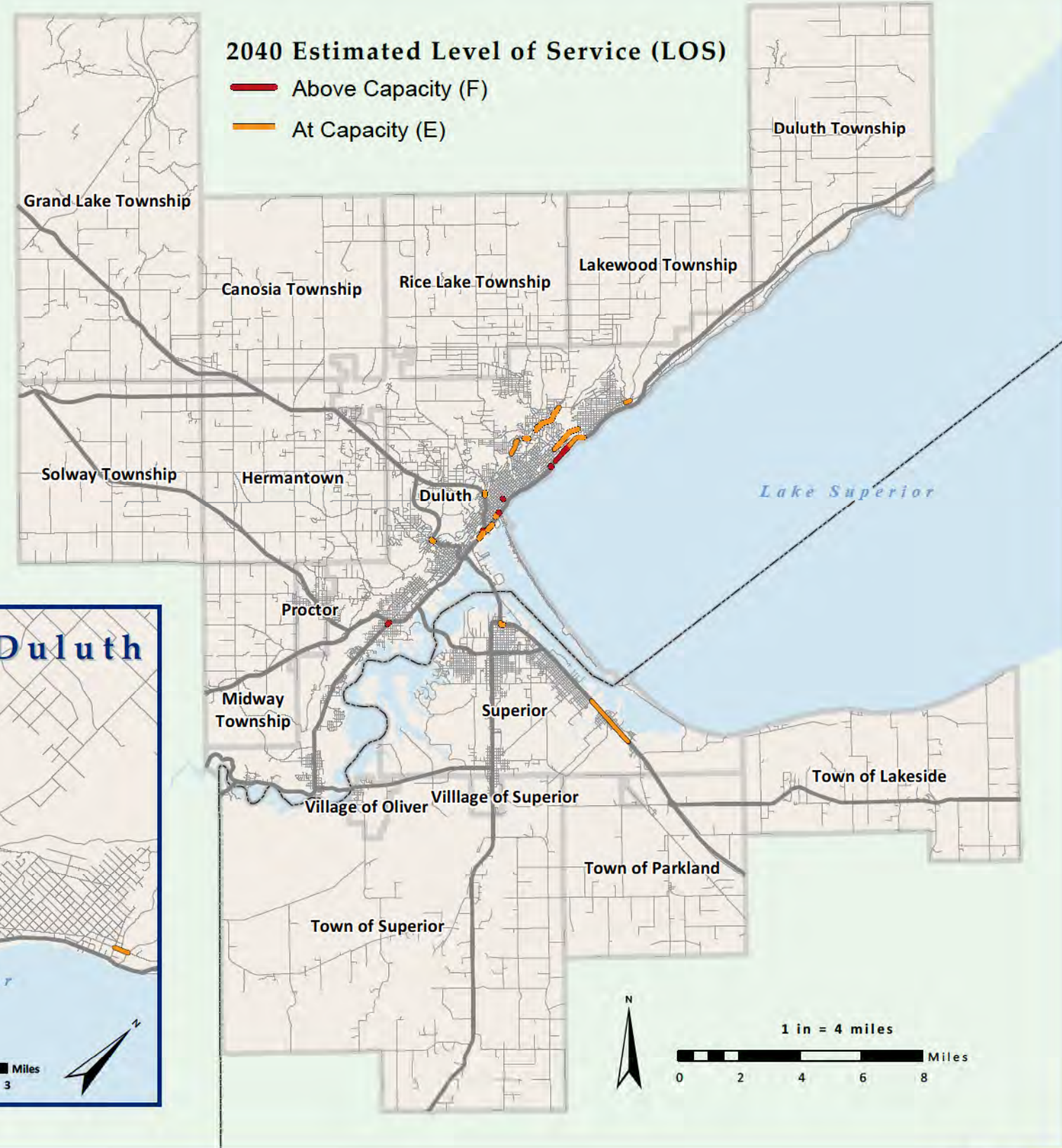
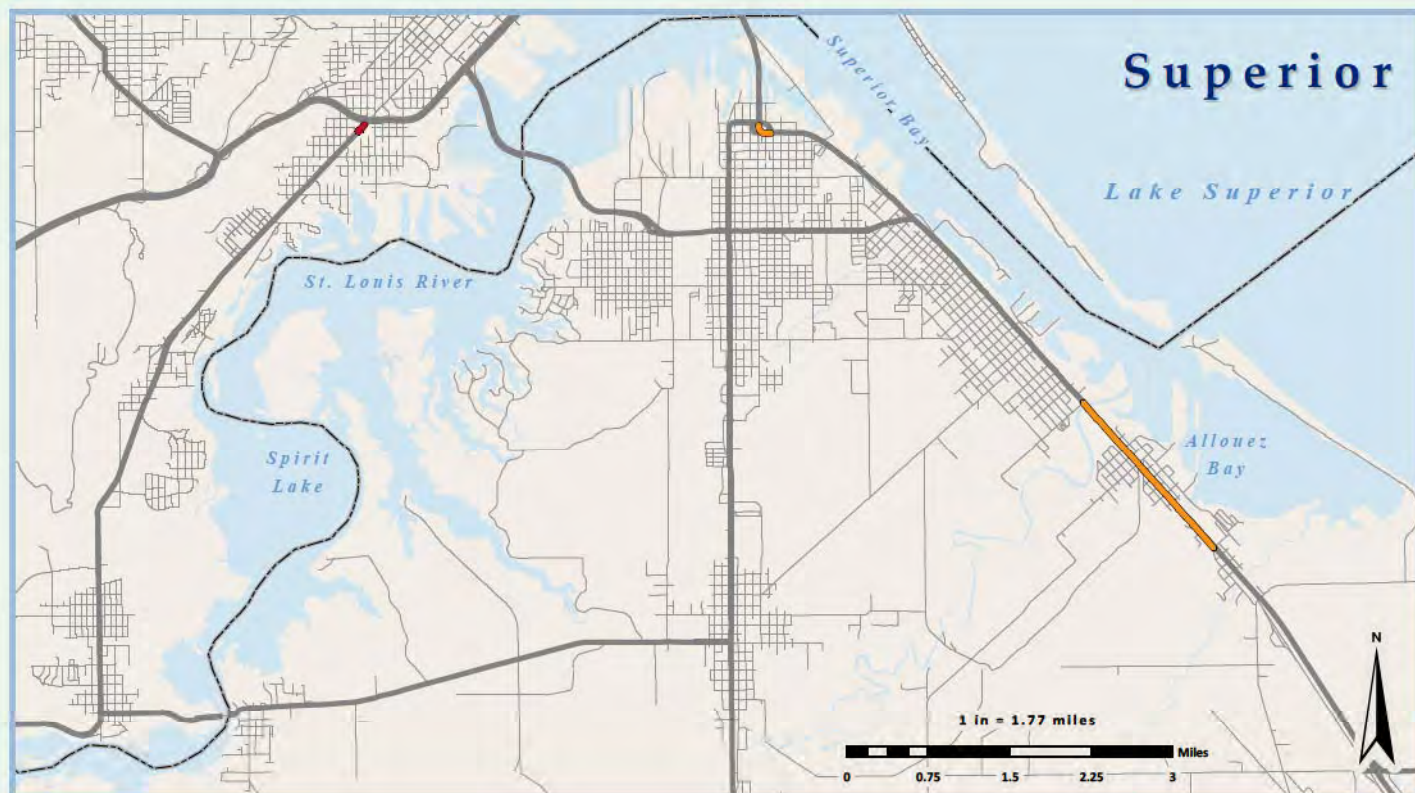
Table 3.16: Projected deficiencies in level of service under three different modeled scenarios (MIC area model)

Jurisdiction	Road Segment	2010		2040 Conservative		2040 Aggressive	
		LOS	AADT	LOS	AADT	LOS	AADT
MnDOT	London Rd (MN STH 61): I-35 off-ramp - 36th Ave E	F	21,200	F	16,049	F	16,276
MnDOT / City of Duluth	Intersection of 26th Ave E & London Rd	E	16,525	F	17,438	F	23,569
MnDOT	Grand Ave (MN STH 23): 62 Ave W - I-35 ramps	E	15,600	F	12,410	F	12,807
City of Duluth	Lake Ave: E 1st Street - I-35	D	12,200	F	16,448	F	17,291
City of Duluth	5th Ave E: E 2nd St - E 3rd St	NA	NA	F	8,914	F	9,260
St. Louis Co.	Woodland Ave: Arrowhead Rd - Snively Rd	E	20,900	E	31,067	F	32,469
City of Duluth	E Superior St: 34th Ave E - 36th Ave E	D	9,000	E	15,413	F	15,874
MnDOT	NB I-35 off-ramp to 5th Ave W	NA	NA	E	11,198	F	11,583
City of Duluth	Kirby Dr: College St - UMD Kirby Center	NA	NA	E	8,707	F	9,105
MnDOT	NB I-35 off-ramp to Superior St	NA	NA	E	8,378	F	8,762
MnDOT	London Rd (MN STH 61): 36th Ave E - 43rd Ave E	E	12,200	E	14,149	E	15,534
St Louis Co.	Snivley Rd: Woodland Ave - Glenwood St	E	10,800	E	14,530	E	14,656
WisDOT	E 2nd St (US 2/53): 31st Ave E - Moccasin Mike Rd	D	17,700	E	28,910	E	29,490
St Louis Co.	Rice Lake Rd: Central Ent - E Skyline Pkwy	B	9,900	E	17,409	E	17,799
City of Duluth	E Superior St: Hawthorne Rd - 34th Ave E	D	9,000	E	14,226	E	14,337
Duluth, MN	NB I-35 off-ramp to Mesaba Ave	NA	NA	E	10,721	E	11,198
WisDOT	NB I-535 on-ramp at US 53	C	9,900	E	10,146	E	10,568
City of Duluth	Saint Marie St: Carver Ave - Stuart Ct	B	4,900	E	8,130	E	8,405
City of Duluth	N 24th Ave W: Piedmont Ave - W Skyline Pkwy	E	9,500	E	8,117	E	8,159
City of Duluth	Michigan St: 2nd Ave W - 1st Ave W	B	2,500	E	4,099	E	4,254
City of Duluth	E Superior St: 36th Ave E - 40th Ave E	D	9,000	E	14,395	E	14,693
City of Duluth	E Superior St: 60th Ave E - 61st Ave E	C	5,500	E	7,812	D	7,640
MnDOT	London Rd (MN STH 61): 60th Ave E - 61st Ave E	E	11,000	D	13,417	E	14,175
MnDOT	Mesaba Ave: E 9th St - Central Ent	D	17,700	D	28,109	E	29,287
City of Duluth	E Skyline Pkwy: Kenwood Ave - Martha St	D	8,700	D	14,013	E	14,731
City of Duluth	5th Ave W: Michigan St - I-35 ramps	B	5,200	D	12,473	E	13,821
MnDOT	SB I-35 on-ramp at S 46th Ave W	NA	NA	D	6,720	E	7,401
City of Duluth	N 21st Ave W: W 3rd St - W 6th St	B	2,450	D	5,800	E	6,344
City of Duluth	Michigan St: 2nd Ave E - 3rd Ave E	B	4,150	D	3,586	E	4,031



Duluth - Superior

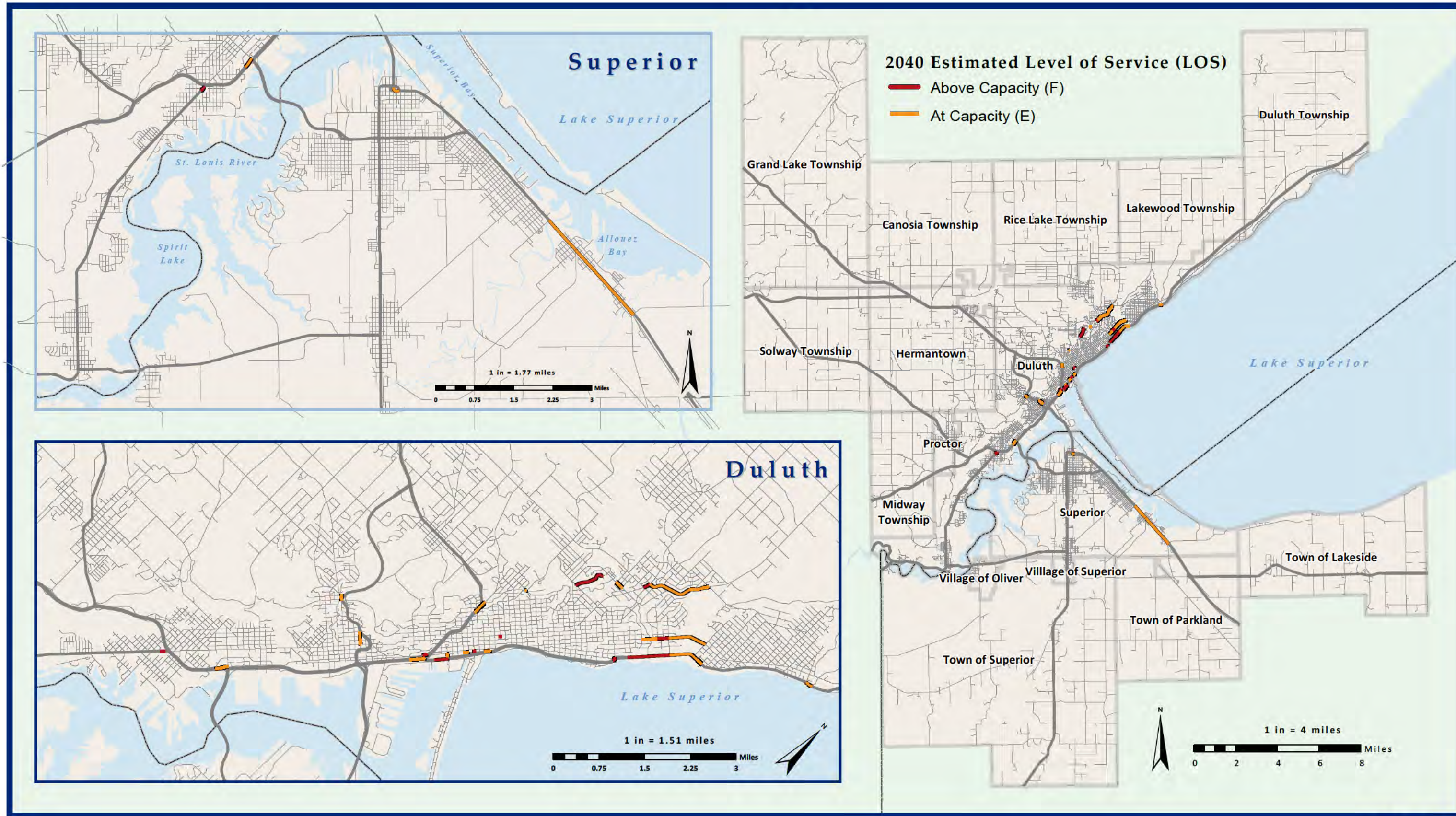
2040 Level of Service - Conservative Scenario





Duluth - Superior

2040 Level of Service - Aggressive Scenario



SYSTEM CONDITIONS

Trend: The ongoing maintenance of the area's roads, bridges, and public transit vehicles will become an increasingly burdensome challenge as public revenue streams are not keeping pace with the costs of maintaining the system.

Transportation assets - roads, bridges, buses, etc - depreciate over time and require ongoing maintenance. The costs of that maintenance is subject to inflation and requires careful planning in terms of how to best manage these assets in the future. The Duluth-Superior area has an extensive network of roads and bridges; and public transit vehicles put on a lot of miles in order to serve that network. The following sections offer a system-wide assessment of the conditions of these assets.

Pavement Condition

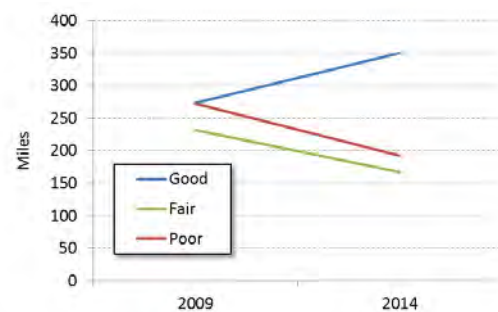
In 2009, the MIC gathered pavement quality data from its jurisdictions and categorized them in an attempt to derive some measure of system condition. It did this again in 2014. The resulting information is only a rough estimate of system condition, as it does not sufficiently speak to the integrity of either road substructure or major infrastructure, but it does provide a sketch of the potential extent of the maintenance needs throughout the MIC area.

On a whole, the pavement condition of the 720 miles of classified roadways in the MIC area appears to have been improving. The number of miles identified as "Good" have increased by 76 miles (28%) (Figure 3.47). Today, nearly half of the system's pavement miles are in good condition (Figure 3.48). But when looking at this same data in terms of who owns and maintains those miles, it becomes apparent that the network of local roads is falling into disrepair at a rate substantially disproportionate to local maintenance efforts (Figure 3.49).



Surface cracking and pavement deterioration

Figure 3.47: Trend in MIC area pavement conditions (2014 vs. 2009)



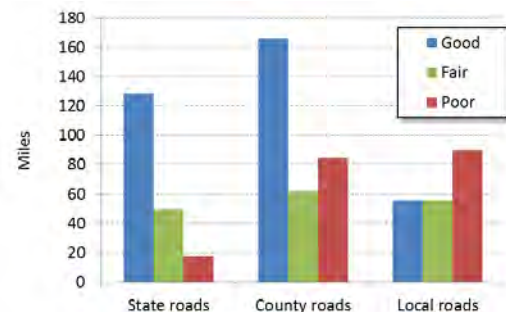
Source: Data provided by MIC area jurisdictions.

Figure 3.48: MIC area pavement quality (2014)



Source: Data provided by MIC area jurisdictions.

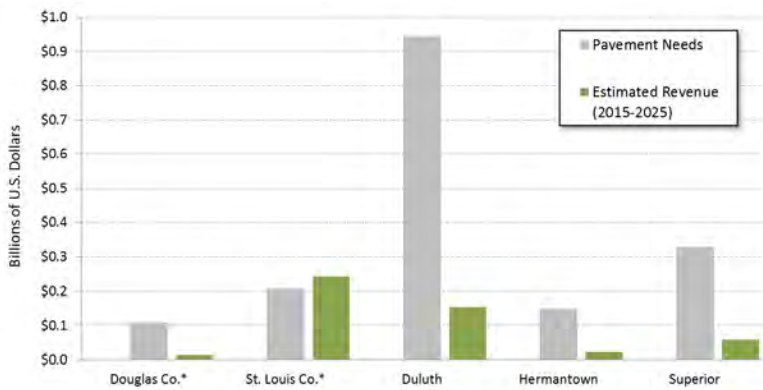
Figure 3.49: Pavement condition of MIC area roads according to jurisdiction type (2014)



Source: Data provided by MIC area jurisdictions.

As explained in more detail in Chapter 5, the financial demands of maintaining the Duluth-Superior transportation system are expected to outpace jurisdictions’ abilities to pay for it, if transportation revenues remain at current levels. Even when forecasting the municipalities’ current levels of funding at a 1% annual rate of inflation over the next 25 years, it would not be enough to bring all the “poor” miles to a “good” condition (Figure 3.50).

Figure 3.50: Comparison of estimated pavement needs and 25-year revenue projections for local jurisdictions (2014)



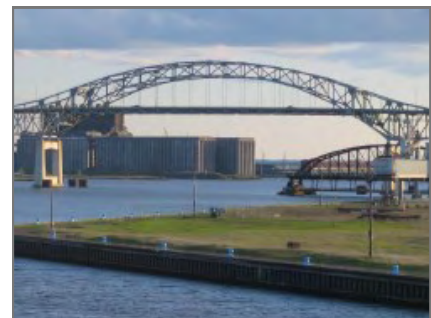
* Portion of total revenue based on the portion of county road miles within the MIC area.

Data sources: Pavement condition ratings as reported by individual jurisdictions (2014); revenue information from the Minnesota Office of the State Auditor and the Wisconsin Department of Revenue (2014).

Condition of Area Bridges

Bridges represent some of the most critical pieces of infrastructure within an area’s transportation system. They also represent some of the most expensive infrastructure with stringent engineering and maintenance requirements, and are thus challenging assets to manage over time.

The Blatnik Bridge (I-535) and Bong Bridge (US 2) are the area’s two most important and iconic bridges, together facilitating the passage of more than 47,000 vehicles across the Duluth-Superior harbor on an average day. But, the MIC area has more than 300 other bridge structures within its boundaries that also need to be maintained. Among these are many ramps and overpasses found along the interstates and major highways throughout the area. For example, the interchange of I-535, I-35, and US 53 (known locally as the “Can of Worms”) contains more than 30 individual bridge structures. MnDOT District 1 has determined that much of the interchange will



View of Bong Bridge from Duluth Harbor

require major reconstruction within the next 20 years and anticipates that construction costs will approach \$500 million.

Data available through the National Bridge Inventory provides information regarding the length and age of the area’s bridges, as well as a sufficiency rating for each structure. Together, this information gives some idea of the condition of the area’s bridges.

The bridge sufficiency ratings are used for the purpose of federal funding. They represent a composite score in which 55% is based on structural condition, 30% on whether elements of its design are obsolete, and 15% on its public importance. The ratings follow a 100 point scale; bridges with ratings lower than 80 are considered eligible for federal repair funding, while bridges with ratings below 50 are considered eligible for funds to help replace them.

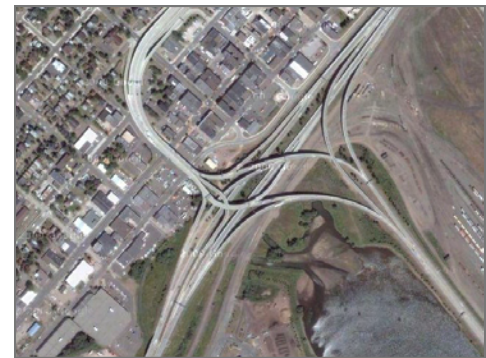
As of 2012, 56% of the bridges within the MIC area had ratings below 80, and 43% had ratings below 50. While these scores do not exactly indicate the degree of disrepair facing these bridges, it provides some sense of the amount of bridge work facing the area jurisdictions in the coming decades. The ages of bridges may be a further indicator of this.

Major bridge structures are typically built and maintained for a lifespan well beyond 50 years. When looking at the age/length profile of bridges within the Duluth-Superior area, it can be seen that almost 80% the bridges and 85% of the total bridge mileage is less than 50 years old (Figure 3.52). While this would suggest that conditions are far from urgent, it should be noted that the majority of the area’s bridges are within 25 to 50 years of age. This suggests that the area could become inundated with necessary bridge replacements at some point in the coming decades. And, given signs that jurisdictions will have financial difficulty in merely maintaining their road pavements, this is a daunting prospect.

Condition of Transit Vehicles

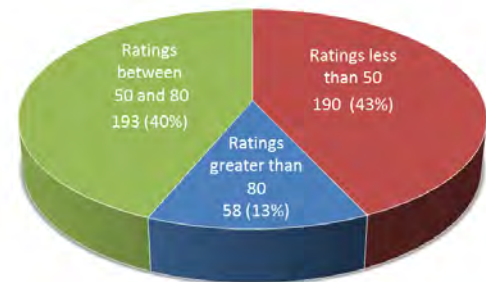
Public transit in Duluth-Superior faces challenges similar to those regarding the area’s pavements and bridges. Federal funding has become less available for bus purchases in recent years and, as a result, the Duluth Transit Authority (DTA) is struggling to maintain the standards it has set for its fleets of buses.

The DTA has estimated the service life of its Regular-Route buses to be 12 years. Because of this, it has aimed to purchase 10 new buses every other year, in order to maintain an average age of six years across its fleet of 65 regular-route buses. This target helps the DTA ensure the safety and comfort of its passengers, as well as meet the its cost targets regarding the maintenance of its vehicles.



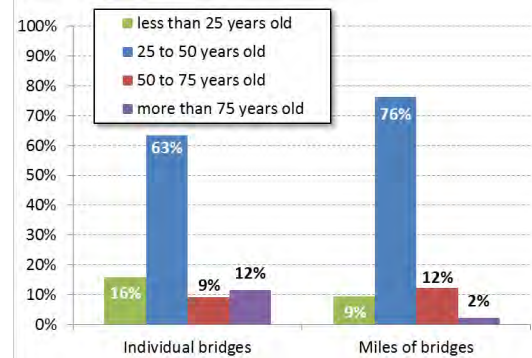
Aerial view of Duluth’s “Can of Worms”
Image source: Google Maps, 2009.

Figure 3.51: Sufficiency ratings of MIC area Bridges (2012)



Source: National Bridge Inventory Database (2014)

Figure 3.52: Age profile of MIC area bridges (2012)



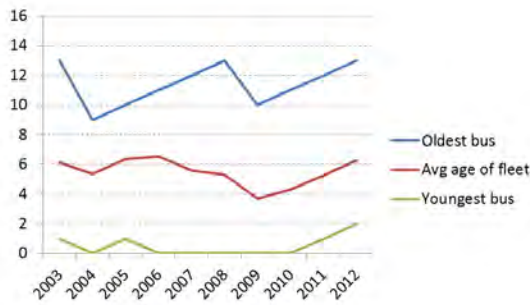
Source: National Bridge Inventory Database (2014)

As Figure 3.51 suggests, the DTA is at a point where it needs to make bus purchases or defer the ordering of replacement buses for its Regular Route service. To make matters worse, increasing demand for transit service in the area means that these aging vehicles are being driven many more miles over their life span (Figure 3.52).

These same trends can be seen with the DTA's fleet of paratransit (or STRIDE) buses. The service life of these vehicles is estimated to be half that of the Regular Route buses, and so the DTA aims to replace three of its nine STRIDE vehicles every three years. However, as Figure 3.53 shows, the average age of the STRIDE fleet was approaching the 6-year target in 2012, and the age of the youngest vehicles had passed the 3-year replacement cycle. While Figure 3.54 indicates that even as the DTA has been distributing mileage equitably across the entire STRIDE fleet, the fleet is reaching the end of its service life.

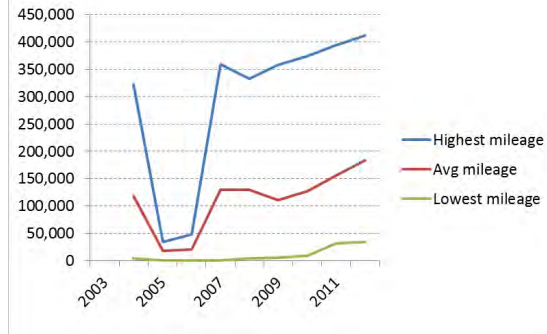
The consequences of driving buses beyond their intended service life are increasing maintenance costs for the DTA, a greater potential for breakdowns and disruptions of service, and an overall decline in ride comfort and service quality for DTA passengers.

Figure 3.51: Age profile of DTA Regular Route bus fleet (2003-2012)



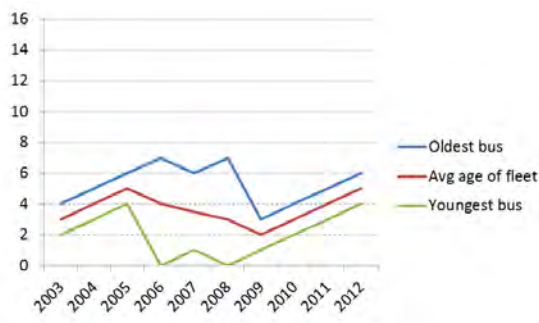
Source: National Transit Database (2014)

Figure 3.52: Mileage profile of DTA Regular Route bus fleet (2004-2012)



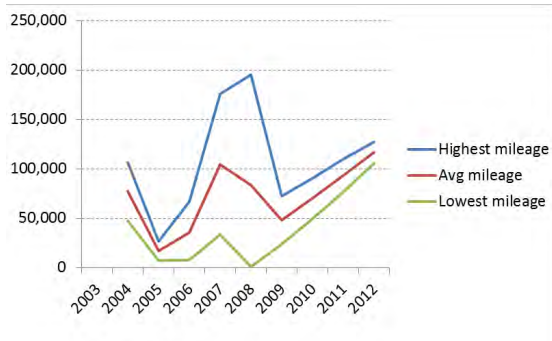
Source: National Transit Database (2014)

Figure 3.53: Age profile of DTA STRIDE bus fleet (2003-2012)



Source: National Transit Database (2014)

Figure 3.54: Mileage profile of DTA STRIDE bus fleet (2004-2012)



Source: National Transit Database (2014)

CONCLUSION:

TRENDS & PROJECTIONS

The Duluth-Superior metropolitan area is not projected to grow at levels that will require significant expansion of the existing transportation system over the next 25 years. It is, however, expected to experience significant changes in the age and distribution of its population. With these changes may come increased demand for different kinds of transportation services.

More people are expected to live further out from the urban central cities of Duluth and Superior, where the area's concentrations of employment, shopping and services will be. This will likely result in greater numbers of vehicle miles being traveled within the MIC area and, as a greater percentage of the population ages beyond their 70's, there will be growing demand for services to address increasing limitations to their mobility.

The Duluth-Superior area will continue to grow in its strengths as a regional trade center and transportation hub for the movement of people and freight, as it draws people throughout the region for shopping, tourism and entertainment. Employment in the area is also expected to grow more than population, and thus greater numbers of people will be commuting from outside the metro area as a result. Transportation patterns are expected to change and a few important corridors, as identified through the Duluth-Superior transportation model, are projected to see increasing traffic congestion.

A more significant trend facing transportation in the Duluth-Superior metro area is the aging of its transportation assets in the face of rising construction costs and static revenues. There are ample signs that jurisdictions are already falling behind in maintaining their pavements, bridges, and transit vehicles. Maintenance costs are expected to grow more rapidly than revenues, making these problems even worse. Because of this, transportation investment priorities for the area will need to focus more and more on system maintenance and preservation.