2012

Transportation System Performance Evaluation

METROPOLITAN COUNCIL

Contents

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Chapter 1: Purpose

This report is a comprehensive review of the Twin Cities transportation system as performed by Metropolitan Council in 2012. This report was prepared to inform the 2014 update of the regional 2040 Transportation Policy Plan (TPP).

The Minnesota State Legislature adopted statutes in 1996 requiring the Metropolitan Council to produce this report (previously called the Transportation System Audit).

The statutory language has since been amended to read as follows:

473.1466 TRANSPORTATION SYSTEM PERFORMANCE EVALUATION.

(a) Prior to each major revision of the transportation policy plan, the council must carry out a performance evaluation of the metropolitan area's transportation system as a whole. The performance evaluation must:

(1) evaluate the area's ability to meet the need for effective and efficient transportation of goods and people;

(2) evaluate trends and their impacts on the area's transportation system;

(3) assess the region's success in meeting the currently adopted regional transportation benchmarks; and

(4) include an evaluation of the regional transit system, including a comparison with peer metropolitan regions with regard to key operating and investment measurements.

(b) The council must update the evaluation of the regional transit system every two years.

(c) The council shall use the results of the performance evaluation to make recommendations for improving the system in each revision of the transportation policy plan.

(d) The council must conduct a peer review of the performance evaluation using at least two nationally recognized transportation and transit consultants.

(e) The council must submit the performance evaluation to the chairs and ranking minority members of the house of representatives and senate committees and divisions with jurisdiction over transportation finance and policy.

The Metropolitan Council completed the first full Transportation Systems Audit in 1997. Since that time there have been subsequent assessments of the transportation system as a whole and of the transit system separately produced by the Council. This report is an update of the 2005 Transportation System Performance Audit and several other iterations of the transit performance audit, most recently the 2009 Transit System Performance Evaluation.

Scope of this Report

This document will review the changing demographics of the region, focusing on population and employment changes from 2000 to current date. The review of demographics includes 2000 US Census data, as well as 2005 and 2010 American Community Survey data. The various modes of transportation (transit, highways, freight, bike/ped, aviation) will all be reviewed within their own chapters. Comparisons to peer regions will be made where applicable. Each modal chapter will include an existing system description, a review of the system performance (where data available) and a discussion of issues/trends for that system.

Chapter 2: The Region and Travel

The Metropolitan Council's official jurisdiction is the seven-county Twin Cities metropolitan area, made up of the following counties: Anoka, Carver, Dakota, Hennepin, Ramsey, Scott, and Washington. It contains the two central cities of Minneapolis and St. Paul, located respectively in Hennepin and Ramsey counties, as well as 184 surrounding communities.

An important note about data within this document: Much of the data presented here will be for the seven-county metropolitan area described above. This area will be called the Twin Cities region (or just "the region"). Because of data availability from the US Census, comparisons to peer regions will be made at the broader metropolitan statistical area (MSA)[1]. Larger than the Twin Cities region, the MSA area includes 13 counties: the seven counties in the Metropolitan Council region, four adjacent counties in Minnesota (Chisago, Isanti, Sherburne, Wright), and two neighboring counties in Wisconsin (Pierce and St. Croix).

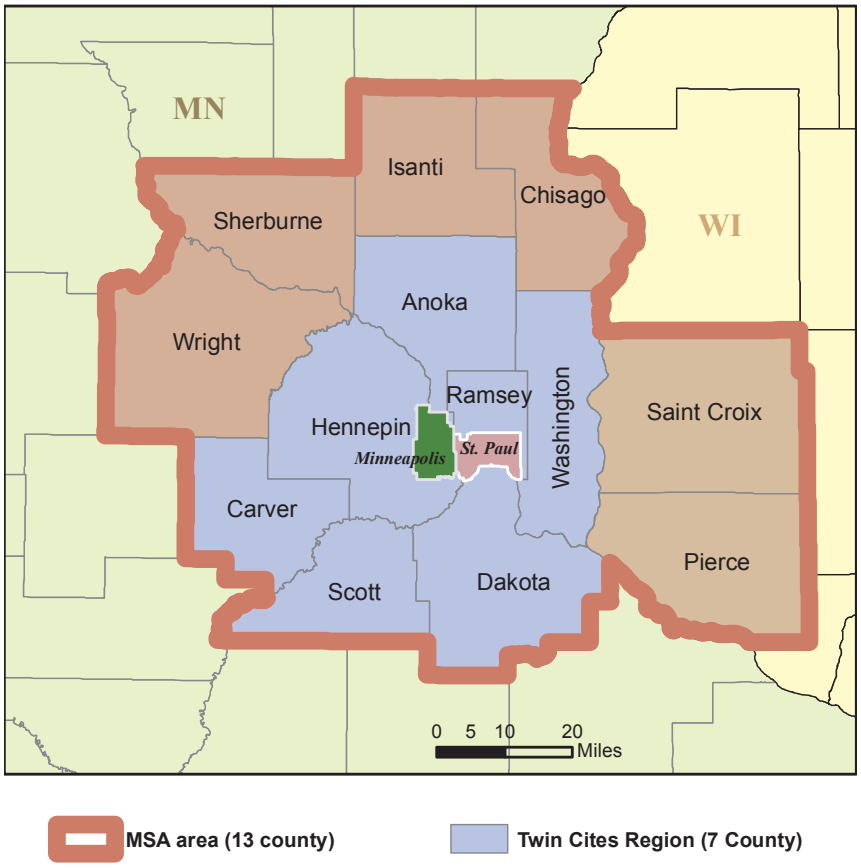

Figure 2-1: Twin Cities Region and 13-county MSA

Within this chapter, the main demographic peer regions used for comparison are the 25 most populated MSAs in the country. The chapters for each transportation mode, which make up the bulk of this plan, will use different sets of peer regions to compare each modal systems. Peer groups will be defined in greater details in those chapters.

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1 An MSA is a US census definition for an urban area of 50,000 people or more, consisting "of one or more counties and includes the counties containing the core urban area, as well as any adjacent counties that have a high degree of social and economic integration (as measured by commuting to work) with the urban core."

Data will also be examined by planning areas identified in the metropolitan development guide. The most-recent metropolitan development guide, the umbrella policy plan in the Twin Cities region, was adopted in 2004. Areas with similar development and expected growth patterns were grouped together (developed areas, developing areas, rural residential, etc) into planning areas. Population and employment statistics will be presented for these areas. More information about the development guide can be found at http://metrocouncil.org/Planning/Planning/2030-Regional-Development-Framework.aspx

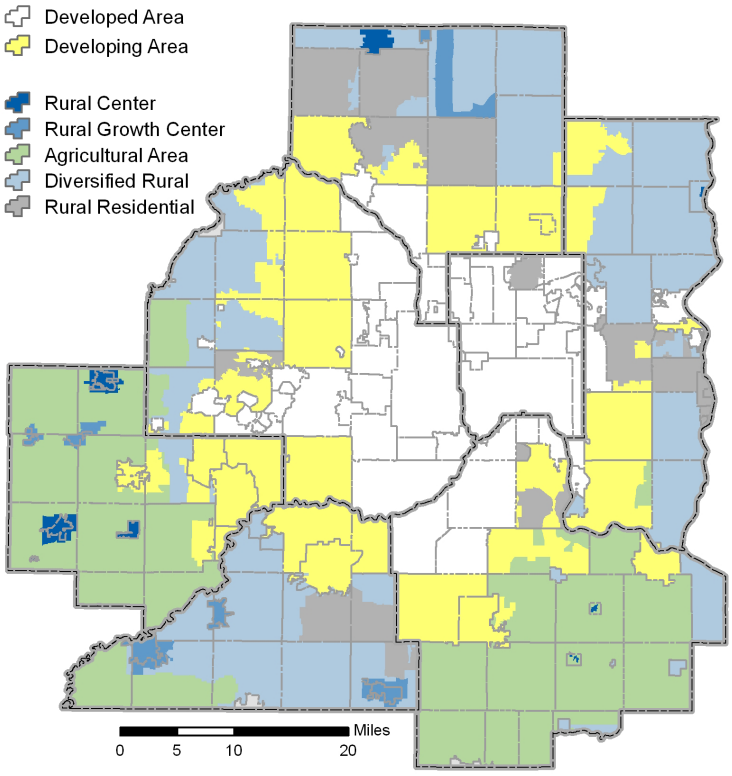


Figure 2-2: Metropolitan Development Guide Planning Areas

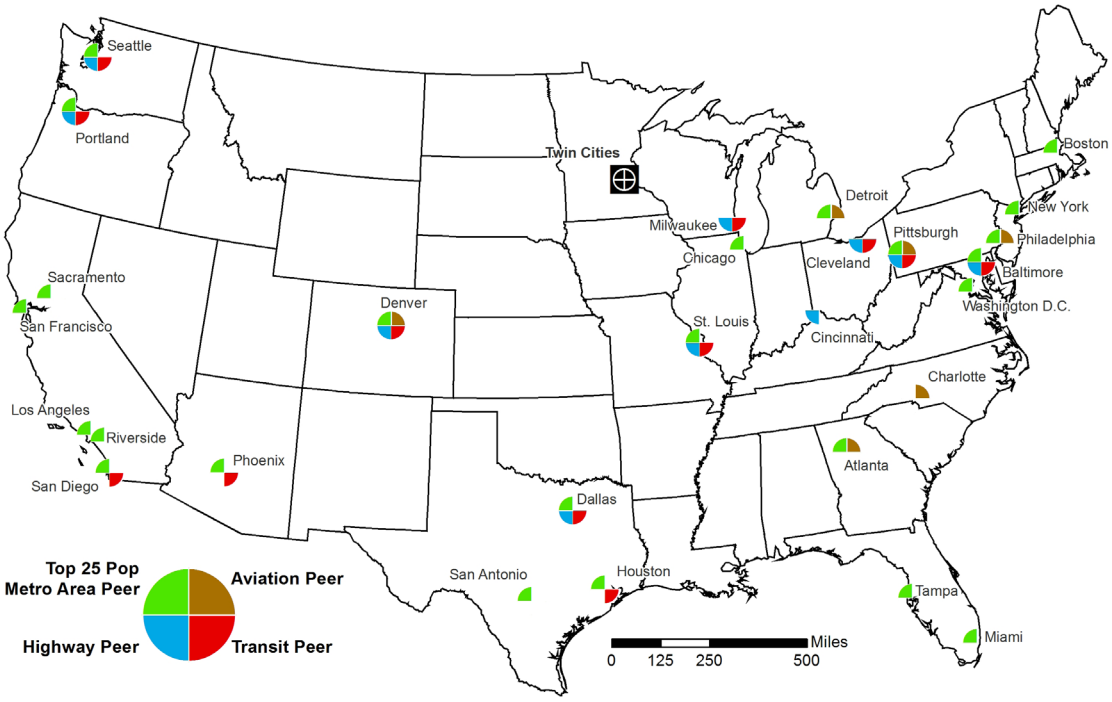


Figure 2-3: Peer Regions

Population Trends

The Twin Cities region has been gaining population and households steadily since 1970. In 2010, the Twin Cities region had 2,849,567 people in 1,117,749 households.

In the 1980s and 1990s, the region's population grew 15% each decade. However, the rate of growth slowed dramatically from 2000 to 2010, to just under 8%.

Of the 25 peer regions, the Twin Cities MSA ranks 16th for total population. Between 2005 and 2010, all peer regions except Detroit gained population. The Twin Cities MSA growth rate, 6.6%, was slightly below peer average. The seven-county region experienced slowing growth in the second half of the decade similar to the Twin Cities MSA.

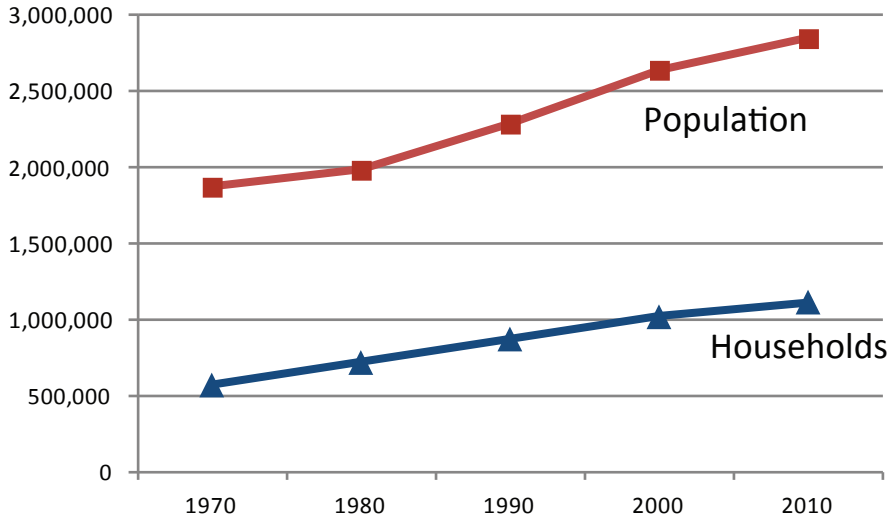


Figure 2-4: Population and Households in Twin Cities region

Shifting Population

Development in the Twin Cities region before 1945 was concentrated in the central cities of Minneapolis and St. Paul. During the 1950s, growth moved into the first ring suburbs. By 2000, the first-ring was mostly developed and the rate of growth there had slowed. Growth moved to the second- and third-ring suburbs, which boomed in the late 90s and early 2000s. Population in the central cities has remained steady, but the regional percentage of households located there has dropped as new households formed or moved to the developing areas. Between 2000 and 2010, the rate of growth in the developing area slowed. The percentage of households in the central cities fell slightly, as did developed areas, while the developing areas showed a small gain in percentage of households (much less than the decade before). Rural growth centers also gained. Percentage of population living in rural areas of the region was relatively unchanged between 2000 and 2010.

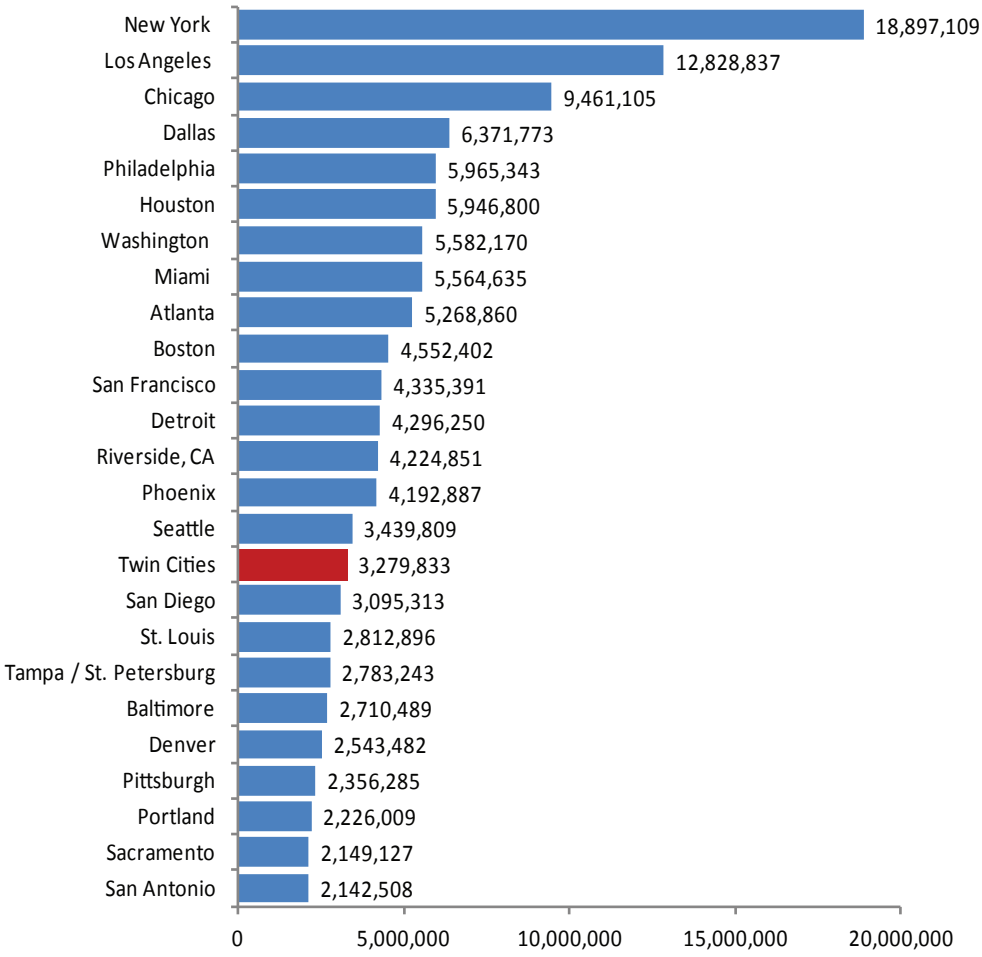


Figure 2-5: Peer Regions (Top 25 MSAs by Population) ranked by 2010 population

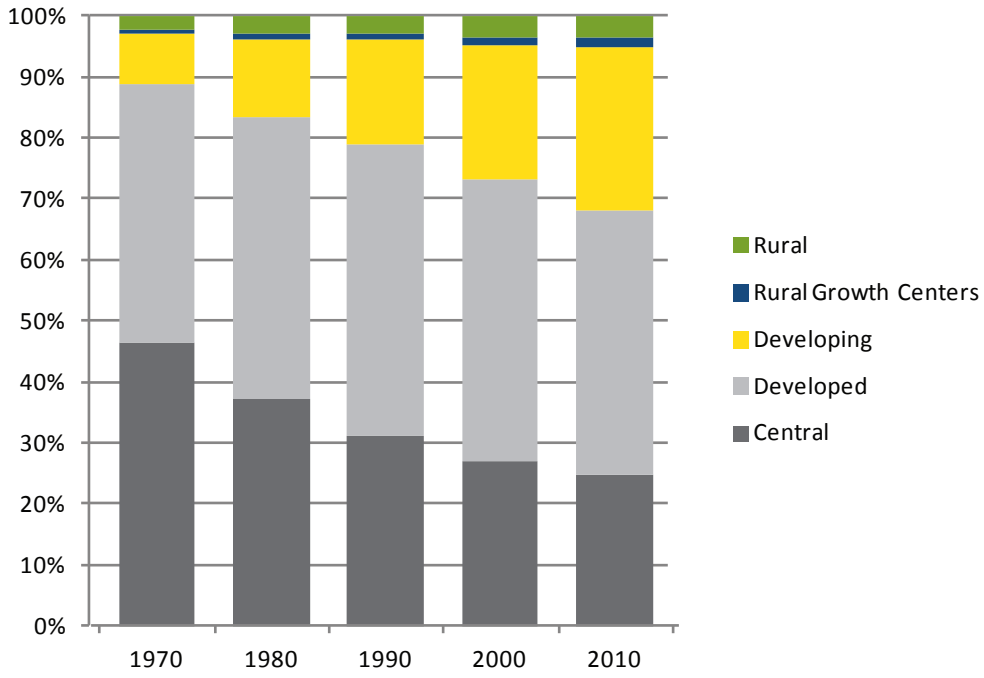


Figure 2-6: Percent Households by Framework Area

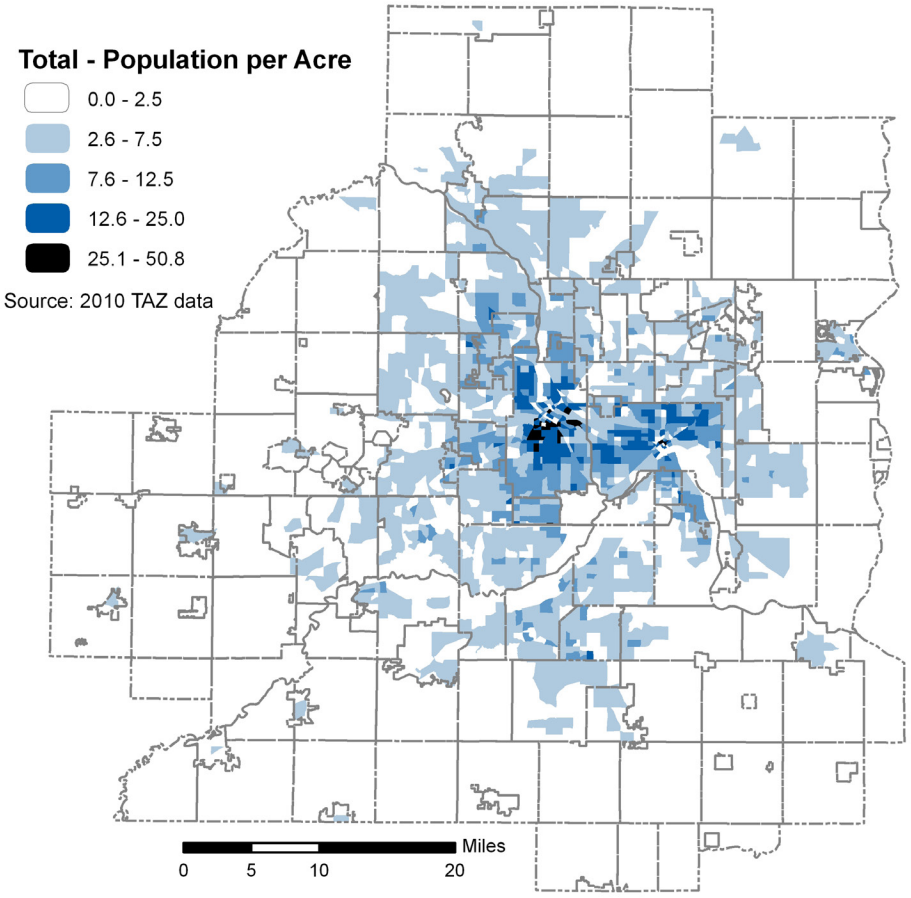


Figure 2-7: 2010 Population Density

Figure 2-7 shows the current population density in the Twin Cities region. With recent high-rise condominium and infill development, the downtown areas of Minneapolis and St. Paul are the most dense area of population in the region. The central cities as a whole are more densely developed than the suburbs. There are pockets of dense development in the outer-ring suburbs, but overall, density falls dramatically while moving outward from the downtown areas and central cities.

Household Size

In the Twin Cities region, the 2000 to 2010 growth of households outpaced the growth of population, 9.4% to 7.9% respectively, adding 96,293 households and 207,505 people. The average household size dropped slightly from 2.53 to 2.50 between 2000 and 2010. The number of one-person households increased slightly in this period from 27.5% of households to 28.5% of households.

On average, trips per capita are higher in single person households than in multi-person households. Increasing single person households increases demand on the transportation system.

Population Age

The elderly population in the region is growing. In 2000, 9.7% of population was older than age 65. By 2010, that number had increased to 10.7%. This is still significantly less than the national average of 13% and a peer region average of 12%.

The central cities and the developing suburbs tend to attract a younger population than the developed, first-ring suburbs and the rural area, which have a large number of aging residents.

The aging regional population is one factor driving increased paratransit usage. Between 2006 and 2011, Metro Mobility, the region's ADA paratransit service provider, saw a ridership increase of 26.5%, from 1.26 million rides in 2006, to 1.59 million rides in 2011. Aging population is not the only factor affecting ridership – changes in service structure moved riders from local dial-a-ride programs to Metro Mobility service. However, it is undeniable that the growing elderly population will increase demand for paratransit service in the future.

The Twin Cities region still ranks above average (11th) for percentage of population within working age (16-64 year olds). About 64% of the MSA population is within this age range. Commuting to and from work is the largest generator of transportation trips, so a large commuting population puts unique demands on the regional system. This demand fluctuates with the economy and employment rates.

Immigrant Populations / Communities of Color

The populations of color in the region grew from 16.8% in 2000 to 23.7% in 2010. This population has historically been concentrated in the central cities of Minneapolis and St. Paul. However, in recent years, more immigrants and people of color have moved into the first- and second-ring suburbs. In 2000, 55% of people of color lived within Minneapolis and St. Paul; however by 2010, this had dropped to just 41%.

Between 2000 and 2010 the Twin Cities saw a large increase of foreign born population, which grew from 206,458 to 308,660, a net gain of over one hundred thousand people and a change from 7.8% of the total metro population to 11% of the population. The two largest and most well established immigrant communities in the region, Hmong and Somali, continue to attract new immigrants to the region.

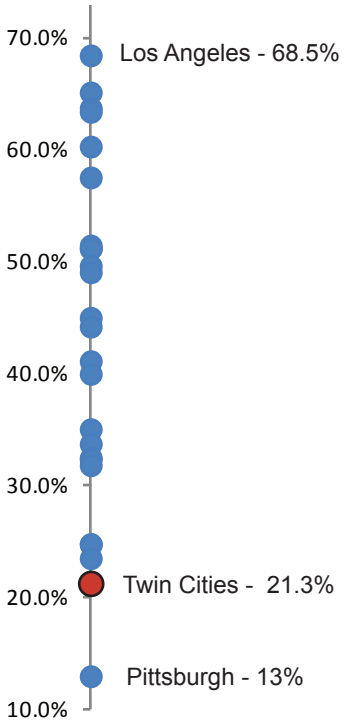


Figure 2-8: Peer Ranking by 2010 Populations in Communities of Color

The Twin Cities MSA has a 21.29% population of color (any person identifying as other than white non-Hispanic), a marked increase from 2005, when 17.9% identified as people of color. The region ranks second lowest in populations of color, behind only Pittsburgh. Ranking among peers is unchanged from 2005.

Employment

Twin Cities employment did not escape the impact of the national recession in the last decade. The booming job growth in the 1990s slowed; in fact, the region lost jobs for the first time in recent decades. Since travel to and from work is the largest generator of transportation trips, the downturn in employment affected peak period travel and transportation trends in general.

The economy did not experience a consistent trend of decline over the last 12 years but had several periods of recession and recovery.

Regional employment peaked in 2001. A national recession soon followed, causing job losses. The 2001 levels were not matched again until 2005 (See Figure 2-9). The region continued to gain jobs until 2007, but another recession caused extensive job losses through 2009 - 2010.

These up and down cycles resulted in a total a loss of 65,000 jobs between 2000 and 2010.

Between 2010 and 2011, the region gained jobs for the first time since 2007. By the end of 2011, employment had returned to 2000 levels.

The regional employment trends were comparable to the national trends. Both regionally and nationally, employment peaked in 2007, with lowest levels observed in 2002 and 2010.

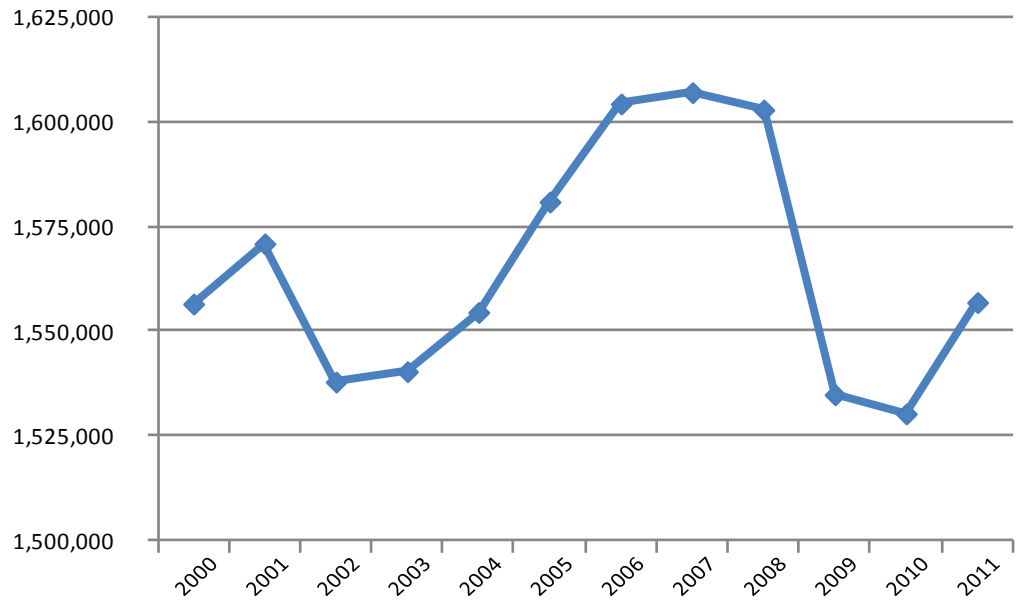


Figure 2-9: Regional Employment 2000 to 2011

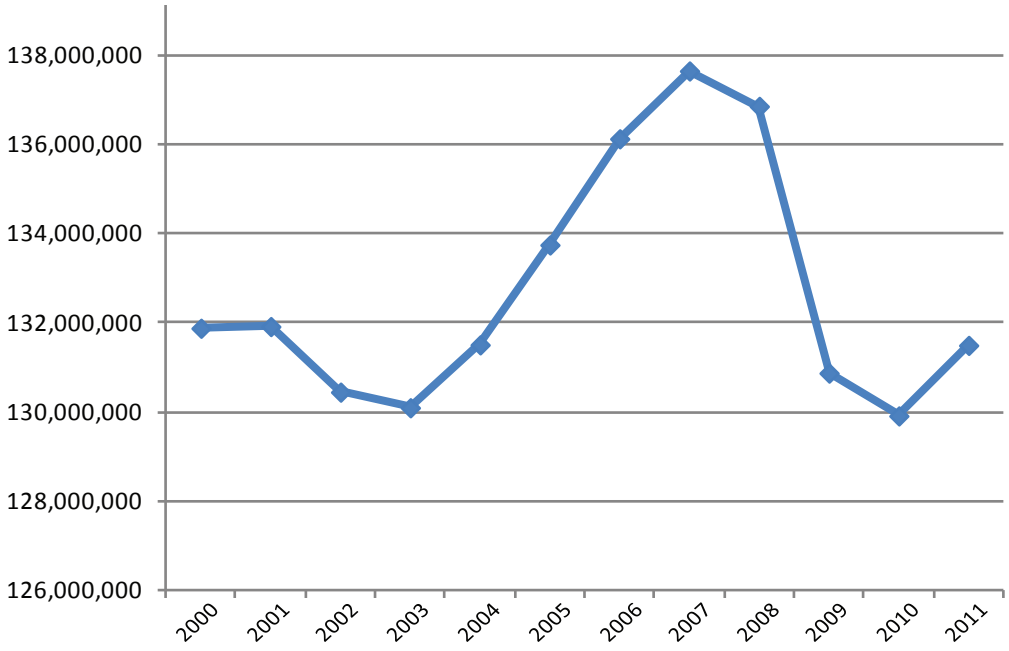


Figure 2-10: National Employment 2000 to 2011

Bureau of labor statistics annual employment seasonally adjusted non farm

The manufacturing, construction, and retail economic sectors suffered the biggest job losses over the 2000 to 2010 period. Education and health services were the only industries to have major gains in employment in the last decade, adding more than 74,000 jobs.

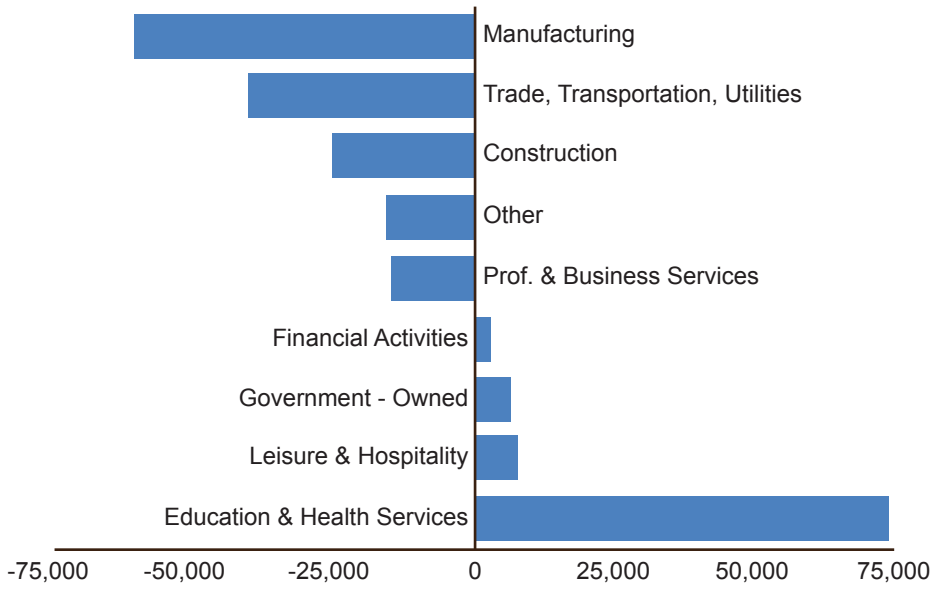


Figure 2-11: Employment Change by Industry Sector, 2000 - 2010

Source: Quarterly Census of Employment and Wages, DEED
Data in Figure 2-11 include all government-sector jobs in "government ownership" category. All other industry groups in private sector jobs only.

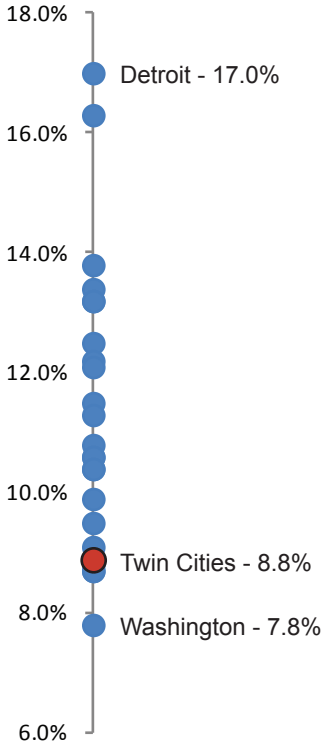


Figure 2-12: Peer Ranking by Unemployment 2010

The Twin Cities MSA had 8.8% unemployment in 2010. This was a significant increase from 2005 when unemployment was at 5.5%. The Twin Cities MSA unemployment rank among peer regions worsened slightly, from second in 2005 to fourth in 2010. The unemployment rate for the Twin Cities MSA was still better than the peer average in both years. All peer regions had increasing unemployment between 2005 and 2010. In the last decade, as the total number of jobs in the Twin Cities region decreased, the working age population (16-64) increased. This imbalance played a part in growing unemployment.

Employment Locations

The downtown areas of Minneapolis and St. Paul have the highest concentration of jobs in the Twin Cities region. Outside of the downtown areas, employment density varies greatly. There are several other large job clusters located along major highway corridors, especially in the southwest quadrant of the region. While the downtown areas experienced a job loss and gain cycle similar to the region as whole, they

have not recovered as well, and the number of jobs is still significantly lower than 2001 levels. From 2000 to 2010, employment fell 8% in Minneapolis, 6% in St. Paul, and 7% in developed suburbs. During this same time, the developing suburbs experienced a 10% growth in jobs, and the rural area employment grew by 7%. Even with the 7% loss in jobs, the developed suburbs still hold the majority of jobs with 48%.

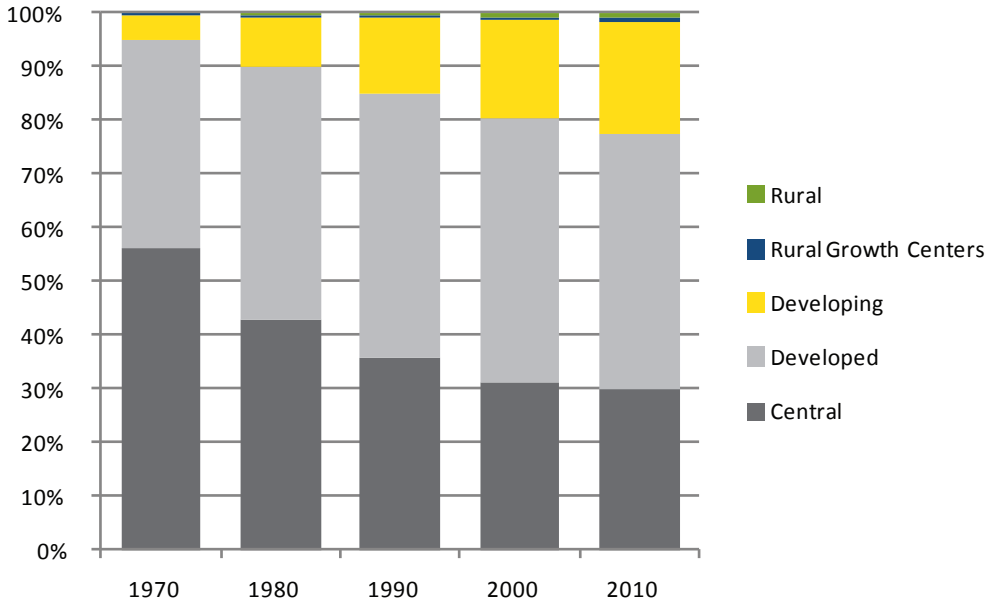


Figure 2-13: Percent Regional Employment by Framework area

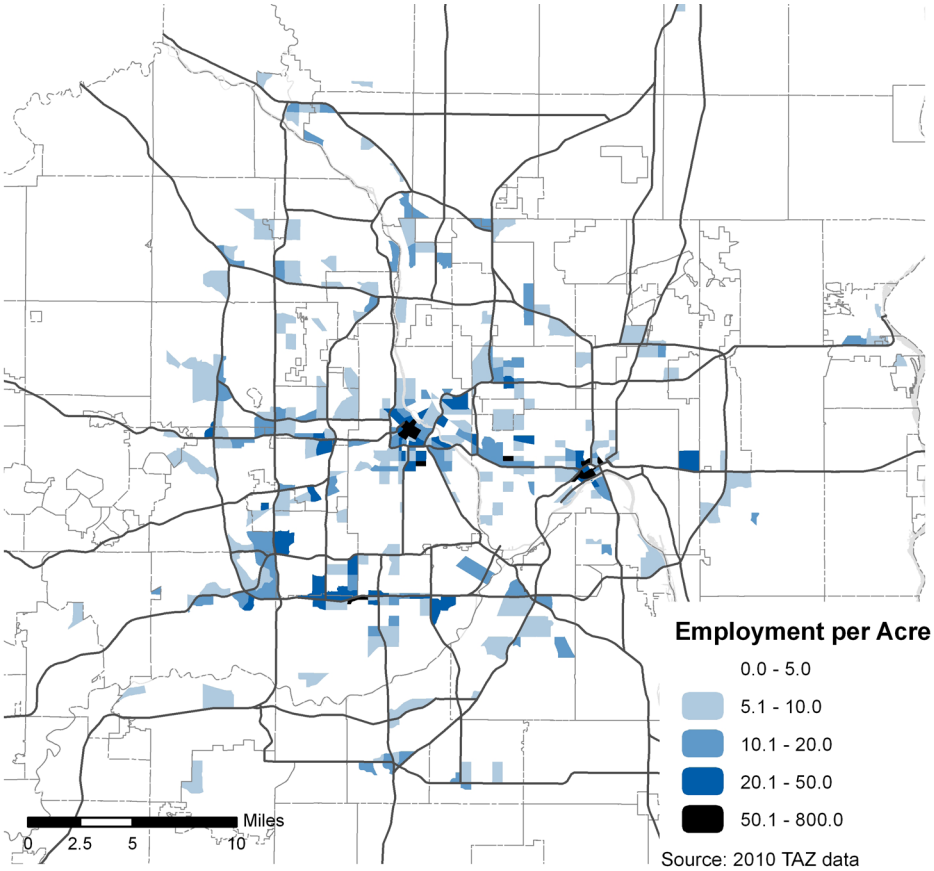


Figure 2-14: Employment Density 2010

Regional Income

Median household income in the region was $65,181 in 2010. This is well above the national median income of $51,914. However, 10% of the region's households were considered in poverty by federal standards.

The Twin Cities MSA ranked 6th highest among peer MSAs by median household income in 2010. However, the Twin Cities MSA 2010 median income decreased 6.4% from 2005, compared to the peer average which fell only 3.1% during this period. This decline caused the region's peer ranking to drop from fourth to sixth.

The percentage of middle-income households is one measure of the economic health and stability of a region. The Twin Cities MSA ranks second among peer regions for largest middle class, with 42.6% of households earning between $40,000 and $99,999 annually. This is well above the peer average of 38.7% and national average of 39.4%. The percentage of middle-income households in the MSA decreased by 2.6% since 2005. Nationally, the decrease was 4.3%. Only five metro areas gained in percentage of households in the middle incomes – San Antonio, Houston, Portland, Pittsburgh, and Tampa.

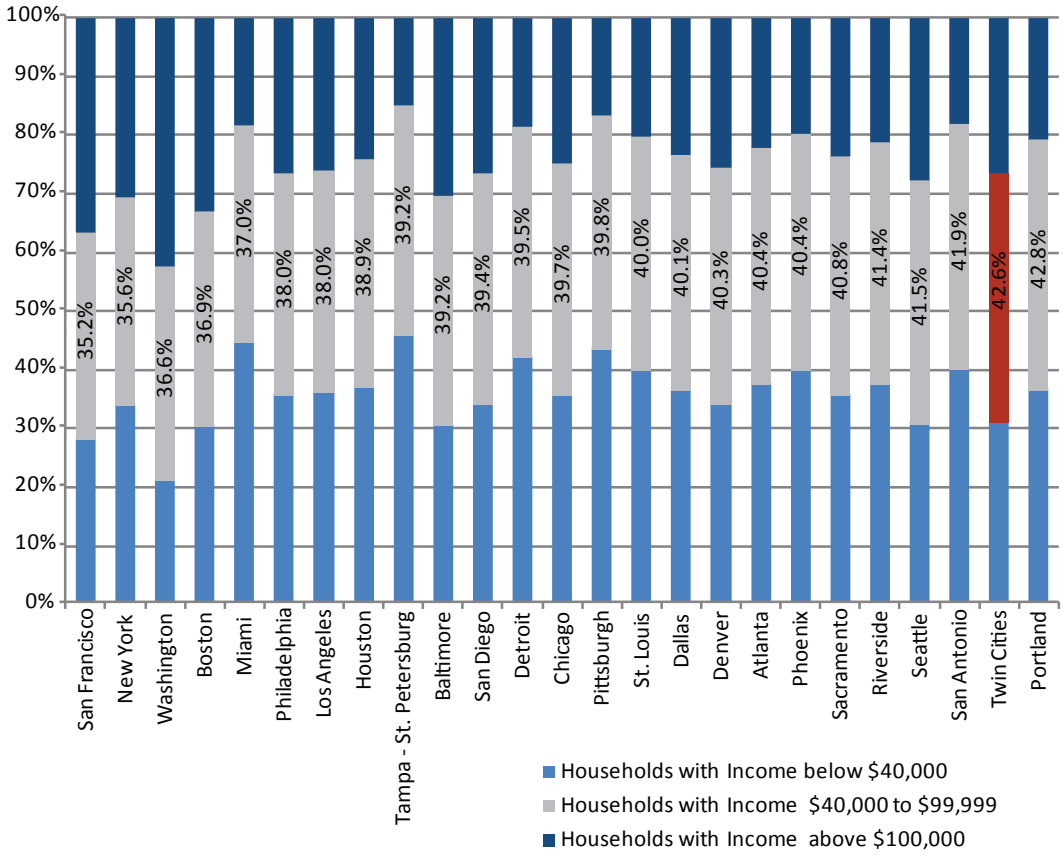


Figure 2-15: Households by low, middle, high income groups

Using the federal definition for poverty, the total number and percentage of people in poverty increased in the Twin Cities region from 6.9% in 2000 to 10% in 2010.

The Twin Cities MSA has lower than average poverty but it is increasing at a greater than average rate. In 2005, the Twin Cities MSA had the 2nd lowest

poverty rate of peer regions. In 2010, it had risen to 4th lowest poverty rate.

From 2005 to 2010, the number of middle-income households in the MSA dropped only slightly while poverty increased and unemployment increased dramatically. Unemployment has affected wage earnings in all economic brackets; however, it would seem that households which were already in the lower income bracket are increasingly falling into federally defined "poverty" ranges.

Factors Affecting Workforce & Employment Statistics

From 1970 to 1990, the percent of women in the workforce grew dramatically, bringing new workers to the workforce and creating new trips and new transportation system demand during traditional commuting times. From 1990 to present time, the female participation rate has remained the same or dipped slightly and is no longer a large factor in increased travel demand. The Twin Cities MSA ranks first among peers for female participation in the workforce, at 81.1%.

The Twin Cities MSA is a highly educated region. In 2010, 25.4% of the MSA population over 25 years of age had a bachelor's degree or higher. This is unchanged from 2005. Only San Francisco, with 26.5% in 2010, had a higher level of education attainment.

Regional Attractiveness

A common measure of the relative attractiveness of a metro area is the number of people moving into the region from other areas. People move to a region for the employment opportunities, amenities, and quality of services. In 2010, 3.4% of Twin Cities residents had moved from outside the MSA within the last year. This was slightly below the peer region average of 3.5%. The percent of new population was relatively unchanged between 2005 and 2010, suggesting the overall attractiveness of the Twin Cities did not change during this (short) time. Other peers with unchanged rates of immigration were Detroit, New York, Washington DC, and Denver. Four peer regions had noticeable declines in migration during this five-year period – Riverside, Atlanta, Tampa, and Phoenix.

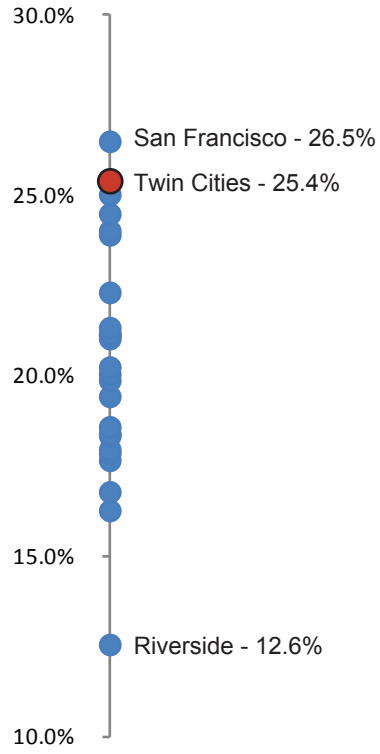


Figure 2-16: Peer Ranking by 2010 Education Attainment - Percent of Population Older than 25 with Bachelor's Degree

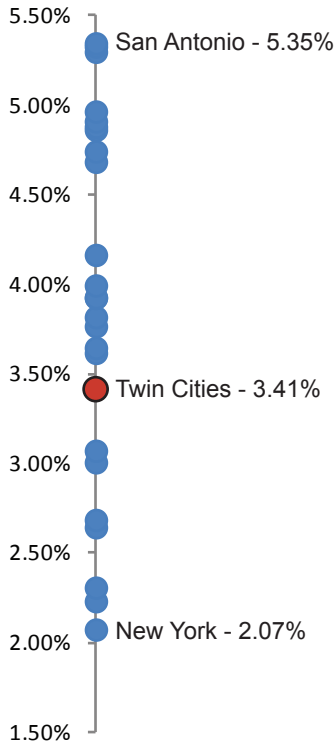


Figure 2-17: Peer Ranking by New Residents in the Last Year. 2010 Data

How the Region Moves

How are the residents of the Twin Cities moving? And how has that changed?

The most comprehensive source of local data on transportation in the region comes from the Travel Behavior Inventory (TBI). The TBI is a battery of surveys conducted roughly every 10 years since 1949. The current TBI cycle started in 2010 – initial results are available. Some statistics reported here are still in draft stage and final calculations may change.

Since the last TBI in 2000, the region added one LRT line and one commuter rail line. Between 2000 and 2010, transit ridership increased by 18%. Total roadway lane miles in the Twin Cities region increased by 11.9%. Increases in both transit ridership and roadway lane mile expansion outpaced the increase in population growth, which was just under 8%.

While the road system was expanding, the actual number of trips and the trips per person were down in 2010. This was a marked change from previous decades, when increases in trips and trips per person increased significantly. In keeping with previous results, the vast number of trips were in a private vehicle (85%). Alternate modes of transportation accounted for 11.2% of trips, which has increased from 9.4% of trips in 2000.

Table 2-1: Weekday Daily Trips by Travel Mode

Travel Mode	Trips	Percent
Walk	621,200	6.6%
Bike	159,900	1.7%
Drive Alone	4,769,800	50.4%
Drive with Passenger	1,559,500	16.5%
Ride as Passenger	1,712,900	18.1%
Public Transit	275,400	2.9%
School Bus	346,100	3.7%
Other	18,900	0.2%
Total	**9,463,700**	**100.0%**

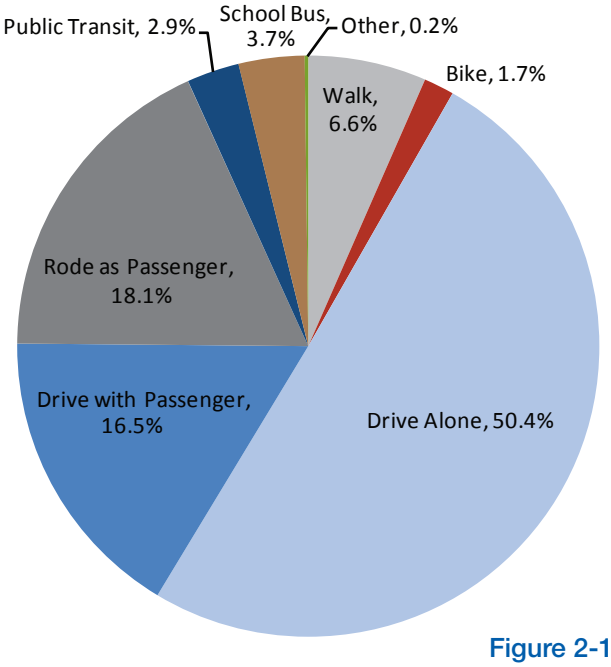


Figure 2-18: Trips by Mode

Daily Trips

Through recent decades, daily trips were increasing. The rate of increase had also accelerated between 1980 and 2000, putting more demand on the transportation system. The 2010 TBI shows a marked difference – trips are down for the first time since the start of the TBI.

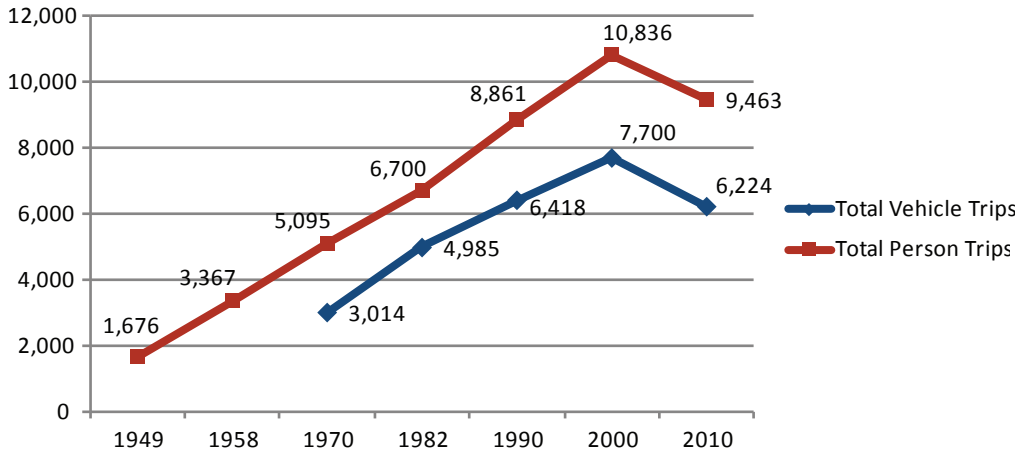


Figure 2-19: Trends in Daily Trips

Also falling for the first time in recent decades, the daily trips per capita went from 4.2 in 2000 to 3.1 in 2010. The increase in unemployment is one major explanation for fewer daily trips.

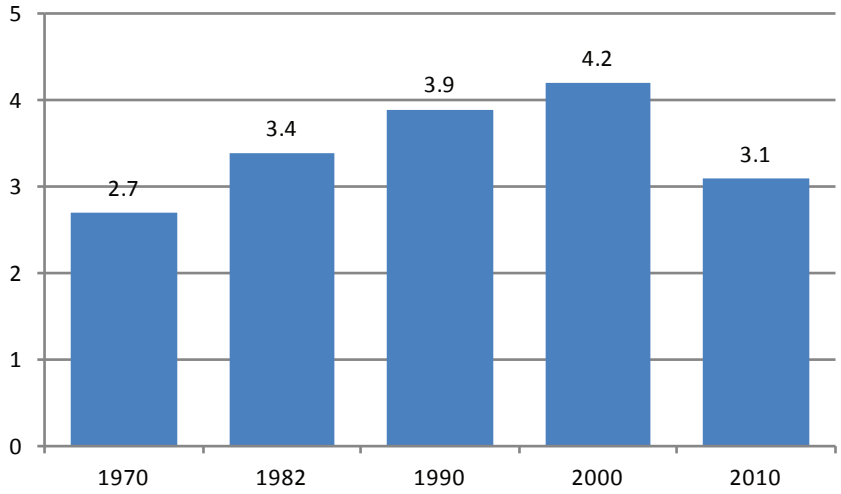


Figure 2-20: Daily Motorized Trips per Capita

Vehicle Occupancy Trends

Overall vehicle-occupancy rates had been dropping in past decades, from a high of 1.57 persons in 1960 to 1.29 in 2010. There was a slight increase from 1990 to 2000, however, 2010 returned to 1990 levels of occupancy. Vehicle occupancy rates for work trips have continued to drop to levels of nearly one person per vehicle.

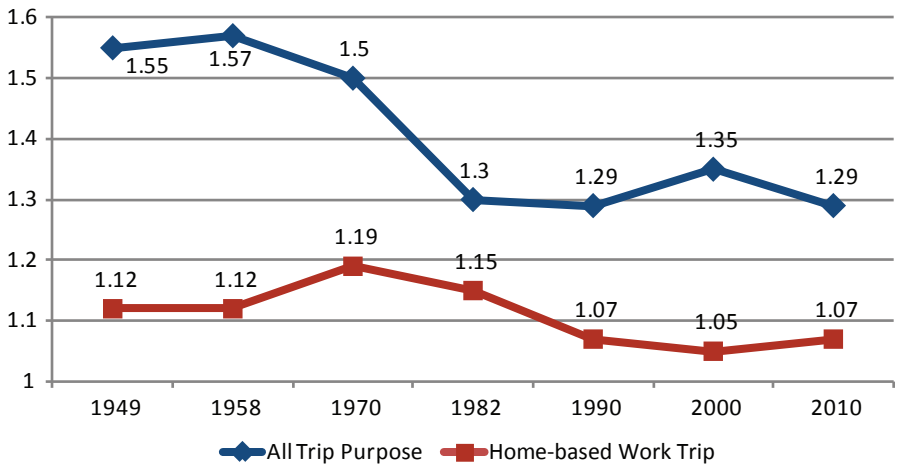


Figure 2-21: Trends in Vehicle Occupancy

Travel Time per Trip

Travel time for the home-based work trip and for all trip purposes continues to increase. The TBI found that the commute trip lengthened from an average of 21 minutes in 1990, to 24 minutes in 2000, and an average of 27 minutes in 2010. The average duration of trips for all purposes increased from 15.8 minutes in 1990 to 21 minutes in 2010.

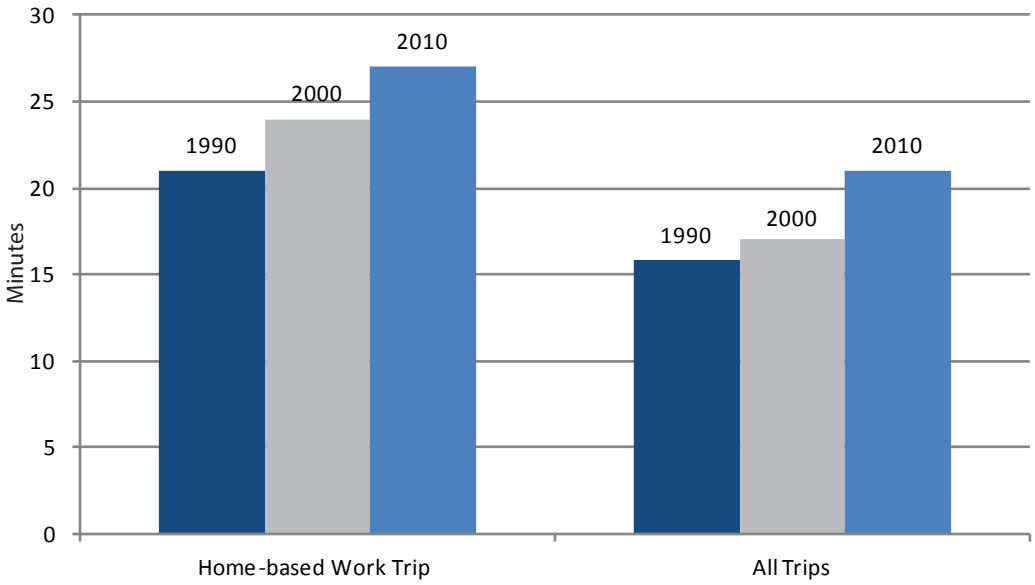


Figure 2-22: Average Travel Time

Length of Trip

The average length of vehicle trips has also increased over time. Between 1970 and 2000, the average length of a trip increased from 6.7 miles to 7.9 miles, an increase of almost 18%. Length of trip is not available yet from the 2010 TBI. The 2000 TBI forecasted the length of trip to modestly increase through 2020.

Contributing Factors to Travel Behavior Changes

Two major factors influencing travel behavior are the cost of gasoline and the impacts of economic downturns on local employment levels.

The price of gasoline went through a period of extreme volatility. In mid-2005, the cost of a gallon of regular gas was hovering around $2. Three years later, in mid-2008 gas prices were peaking at $4 per gallon followed by a precipitous drop in late 2008/early 2009 to under $2 per gallon. This was followed by gradual climb to current levels fluctuating between $3 and $4 dollars per gallon.

Employment levels in the Twin Cities region went through a period of significant decline in the past several years, though are showing a rebound in 2011 and 2012. The employment in the region in 2010 was the lowest it had been in more than a decade.

The changes to these two parameters resulted in significant changes in travel behavior. Not only did the economic slump result in fewer jobs (thus fewer trips to and from work), but also prompted concerns around job security and personal income. This resulted in households typically reducing their discretionary spending (less spent on shopping, entertainment, etc.). These changes also resulted in fewer trips, and shorter trips (to reduce gasoline use). It also encouraged the conversion from auto to transit trips.

Chapter 3: Highway System

Characteristics of the Highway System

The seven-county Twin Cities region has more than 16,500 miles of roadways. The functional class of a roadway describes its role within the hierarchy of roadways according to its primary function— for example, mobility for through trips or access to adjacent lands. The region uses a four-class system to designate the function of its roads -principal arterials, minor arterials (A&B), collectors and local streets.

Principal Arterials -- Principal arterials are the high-capacity highways that make up the Metropolitan Highway System. These are primarily the interstate and state trunk highway system, although some county highways are also included in the principal arterial system.

Minor Arterials – These are roadways within the Twin Cities region that are not principal arterials but perform a regionally significant role in the transportation system. These roadways are designated the "A" Minor Arterial System and are classified into the following groups:

- **Relievers** - Minor arterials that provide direct relief for traffic on major metropolitan highways. These roads include the closest routes parallel to the principal arterials within the core adjacent communities, but not in rural areas. These roadways are proposed to accommodate medium-length trips (less than eight miles) as well as to relieve congested principal arterials. There are approximately 310 miles of relievers in the seven-county region. Improvements to relievers focus on providing additional capacity for through traffic.
- **Expanders** - These routes provide a way to make connections between developing areas outside the interstate ring or beltway. These routes are located beyond the area reasonably served by the beltway. These roadways are proposed to serve medium-to-long suburb-to-suburb trips. The seven-county region has approximately 430 miles of expanders. Improvements to expanders focus on preserving or obtaining right-of-way for future expansion.
- **Connectors** - These roads provide good connections among town centers in developed and rural areas within and near the seven counties. There are approximately 640 miles of connectors in the seven-county region. Improvements to connectors focus on safety and improving load-carrying capacity.
- **Augmenters** - The fourth group of "A" minor arterials are those roads that augment principal arterials within the interstate ring or beltway. The principal-arterial network in this area is in place. However, the network of principal arterials serving the area is not in all cases sufficient to serve the density of development in this area. In these situations, these key minor arterials serve many long-range trips. There are approximately 145 miles of augmenters in the seven-county region. Improvements to augmenters focus on providing additional capacity for through traffic.

B-Minors — These are roadways within the Twin Cities region that are not principal arterials and do not perform a regionally significant role in the transportation system as do the "A" Minor Arterials. These roads fill local needs rather than regional.

Collector Streets – These streets connect neighborhoods to one another and to areas of regional business concentration.

Local Streets – These streets provide access primarily to homes and businesses.

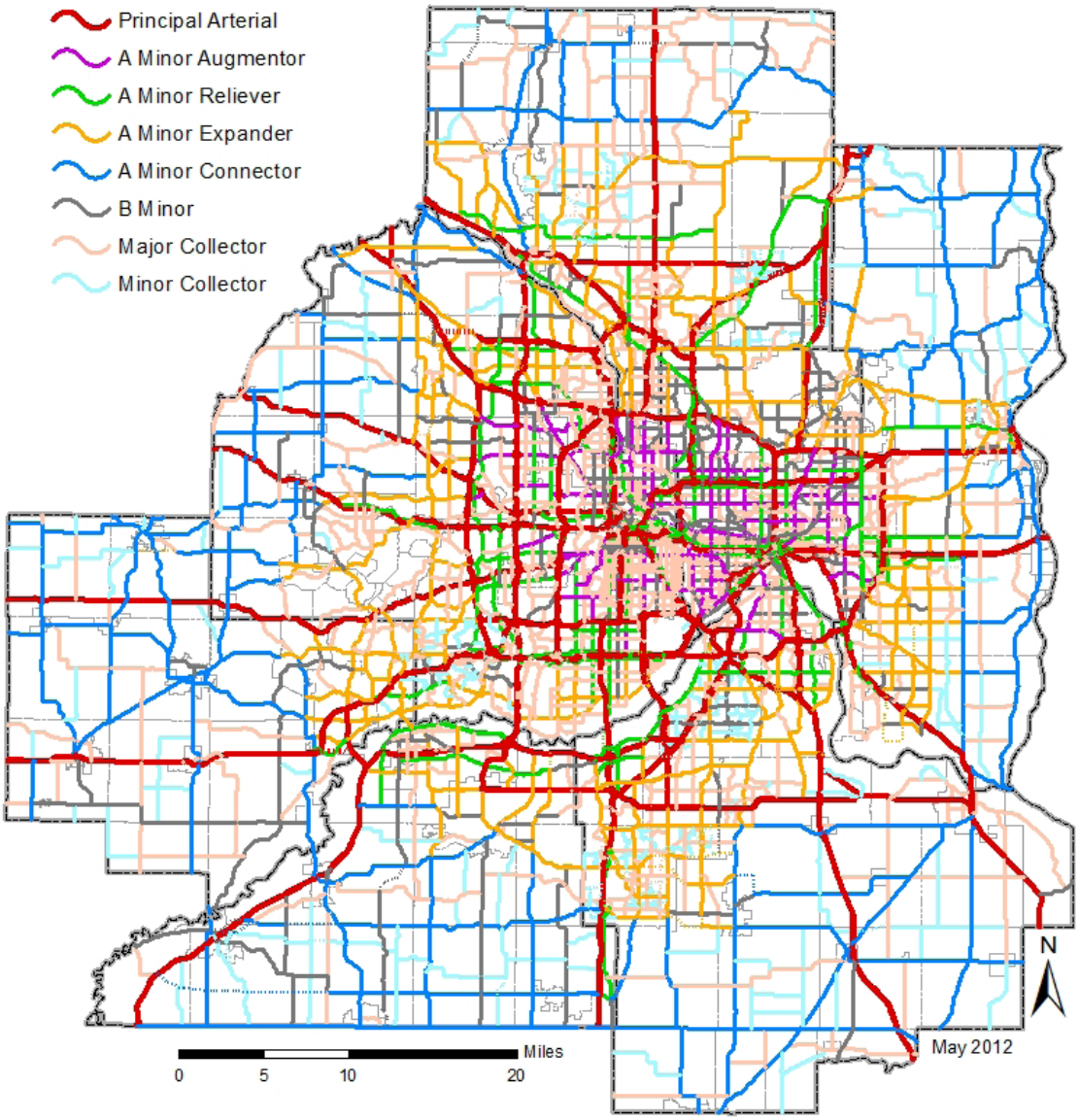


Figure 3-1: Functional Class Roads

Growth in Roadway System Mileage

Between 2000 and 2010, lane miles in the seven-county Twin Cities Region increased by 11.4% (3,723 lane miles). This growth outpaced the increase in the regional population during that same period (7.9%).

Roadway System Performance

The Texas Transportation Institute (TTI) compiles data on transportation system performance for metropolitan areas throughout the United States. This data can be used to measure changes in the performance of the Twin Cities' highway system over time and provide a rough comparison with other urban areas in the United States. TTI considers the Twin Cities a "large urban area,[1]" the second-largest urban area category. In this report, the Twin Cities area is compared to the average for other large urban areas, as well as with the average for 10 identified highway peer urban areas. These peer urban areas are Baltimore, Cincinnati, Cleveland, Dallas, Denver, Milwaukee, Pitts-

1 TTI definition of a large urban area is a metro region with population between 1 million and 3 million.

Table 3-1: Lane Miles by Functional Class 2010 - Seven-County Metro Area

Functional Class - 2010	Miles
Principal Arterial	2,949
Minor Arterial	6,127
Collector	3,984
Local Systems	23,328
Total	**36,388**

Source: Minnesota Department of Transportation, Transportation Information System Database

Table 3-2: Lane Miles by Functional Class 2000 - Seven-County Metro Area

Functional Class - 2000	Miles
Principal Arterial	2,866
Minor Arterial	5,622
Collector	3,579
Local Systems	20,598
Total	**32,665**

Source: Minnesota Department of Transportation, Transportation Information System Database

burgh, Portland, Seattle and St. Louis. The most recent year for which TTI had available data was 2010. A map of highway peer cities can be found in the previous chapter, Figure 2-3 on page 5.

The Twin Cities has more roadway-centerline miles per person than the average for the region's peer urban areas and TTI's large urban areas. This comparatively high amount of roadway is partly because the Twin Cities has one of the least dense patterns of urban development in the country, requiring more miles of roadway to provide access for users of the system. Roadway centerline mileage includes all roadways, including local streets, but does not include lane mileage.

The Twin Cities has a higher number of roadway centerline system mileage per capita than other large urban areas and the region's peer cities as shown in Figure 3-2.

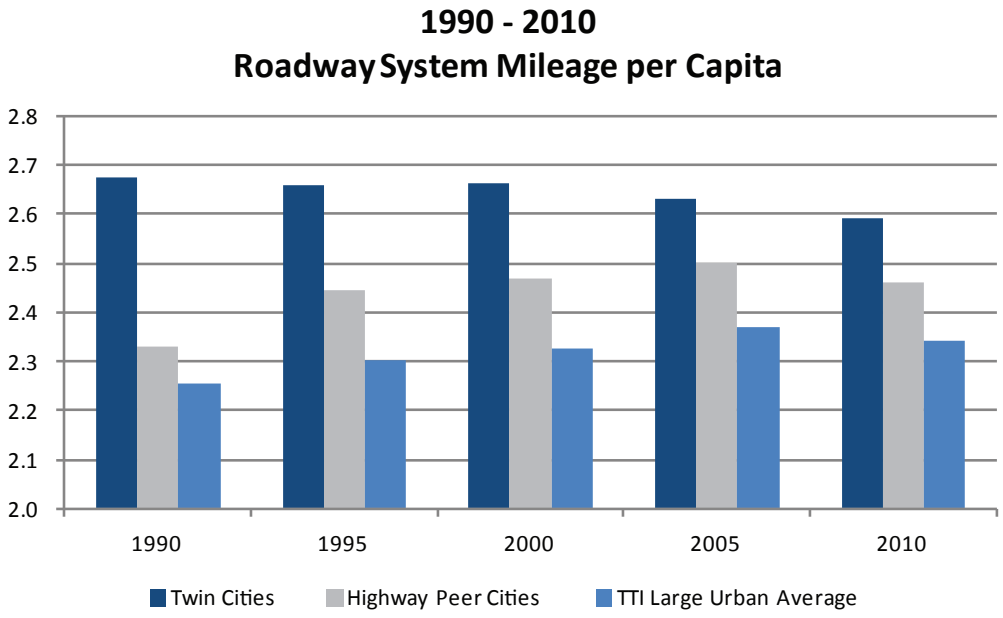


Figure 3-2: Roadway System Mileage per Capita

Pavement Condition

The Minnesota Department of Transportation evaluates the quality of the road pavement under its jurisdiction. This is measured in terms of the Ride Quality Index (RQI). The RQI is an indicator of pavement smoothness based on user ratings. The RQI is expressed as a number between 0 and 5 with the smaller values indicating greater pavement roughness. A section of roadway with a RQI rating of 3 is considered to be in good condition. MnDOT's goal is to maintain at least 70% of principal arterials and 65% of non-principal arterials in good or very good condition, and allow less than 2% of principal arterials and 3% of non-principal arterials to be in poor or very poor condition.

As shown in the following figures, the pavement condition for both principal arterials and non-principal arterials are not meeting MnDOT's performance goals. In the seven-county metropolitan region, the condition of the principal arterials have nearly met both performance goals throughout the 2000's (and did meet the goal for good/very good pavement conditions in 2010). However, the non-principal arterials have not met the goals since the late 1990's. The non-principal arterials exhibit a greater gap between the observed pavement conditions and the performance goals.

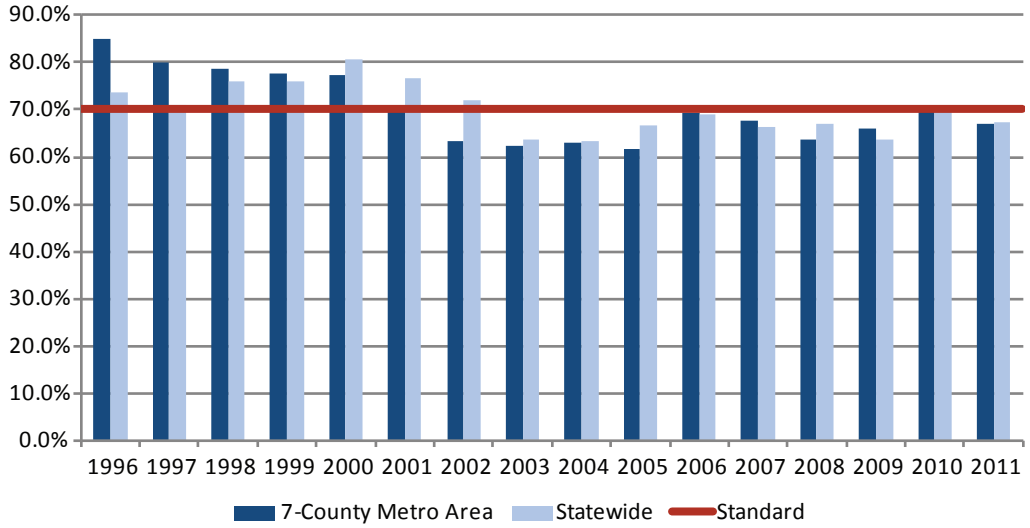


Figure 3-3: Principal Arterials - RQI in Good / Very Good Category

Preferred scores are above the standard (red line)

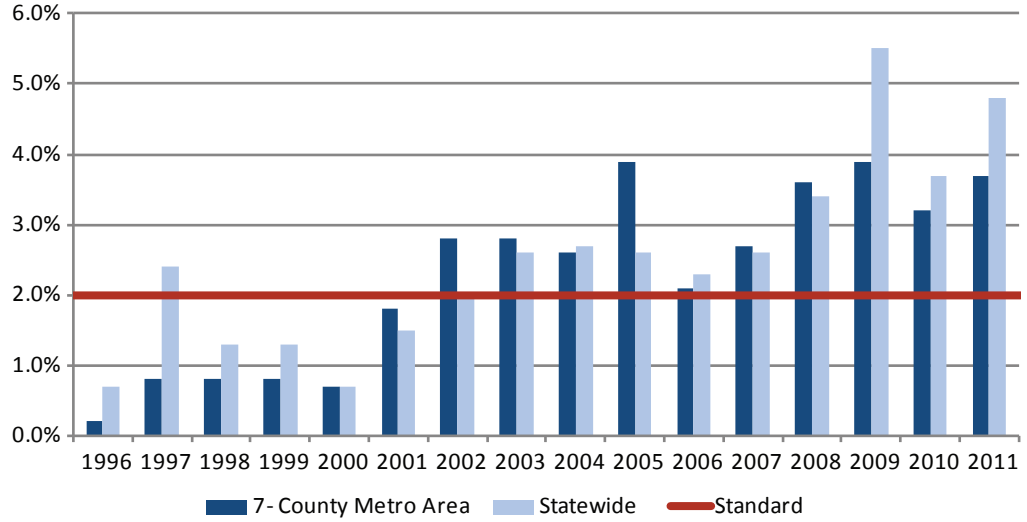


Figure 3-4: Principal Arterials - RQI in Poor / Very Poor Category

Preferred scores are below the standard (red line)

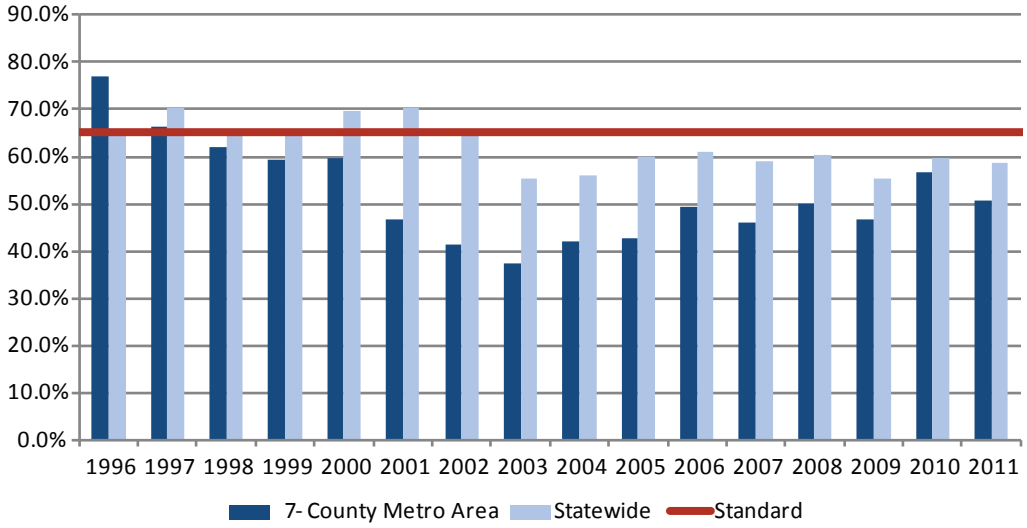


Figure 3-5: Non-Principal Arterials - RQI in Good / Very Good Category

Preferred scores are above the standard (red line)

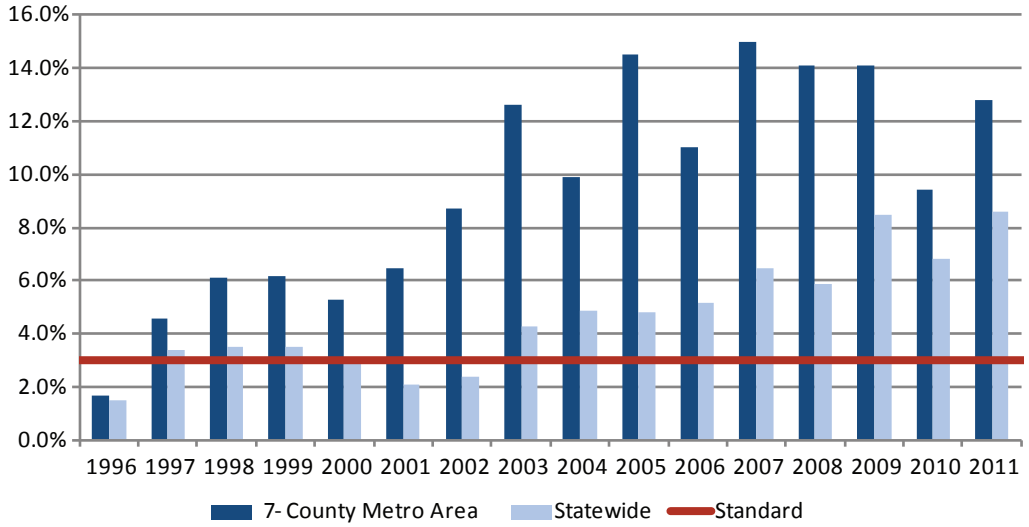


Figure 3-6: Non-Principal Arterials - RQI in Poor / Very Poor Category

Preferred scores are below the standard (red line)

In 2011, MnDOT implemented the Better Roads for Minnesota program. The goal of the four-year program is to improve more than 500 miles of roads and reduce the proportion of roadway mileage in the poor pavement category. Numerous projects shown in Figure x are funded by the program are located in and around the metropolitan region.

The pavement on the region's highway system is generally in good condition, but has shown a generally continual decline between 1996 and 2010. The pavement quality of the non-principal arterials has shown an even more dramatic decline during the same period.

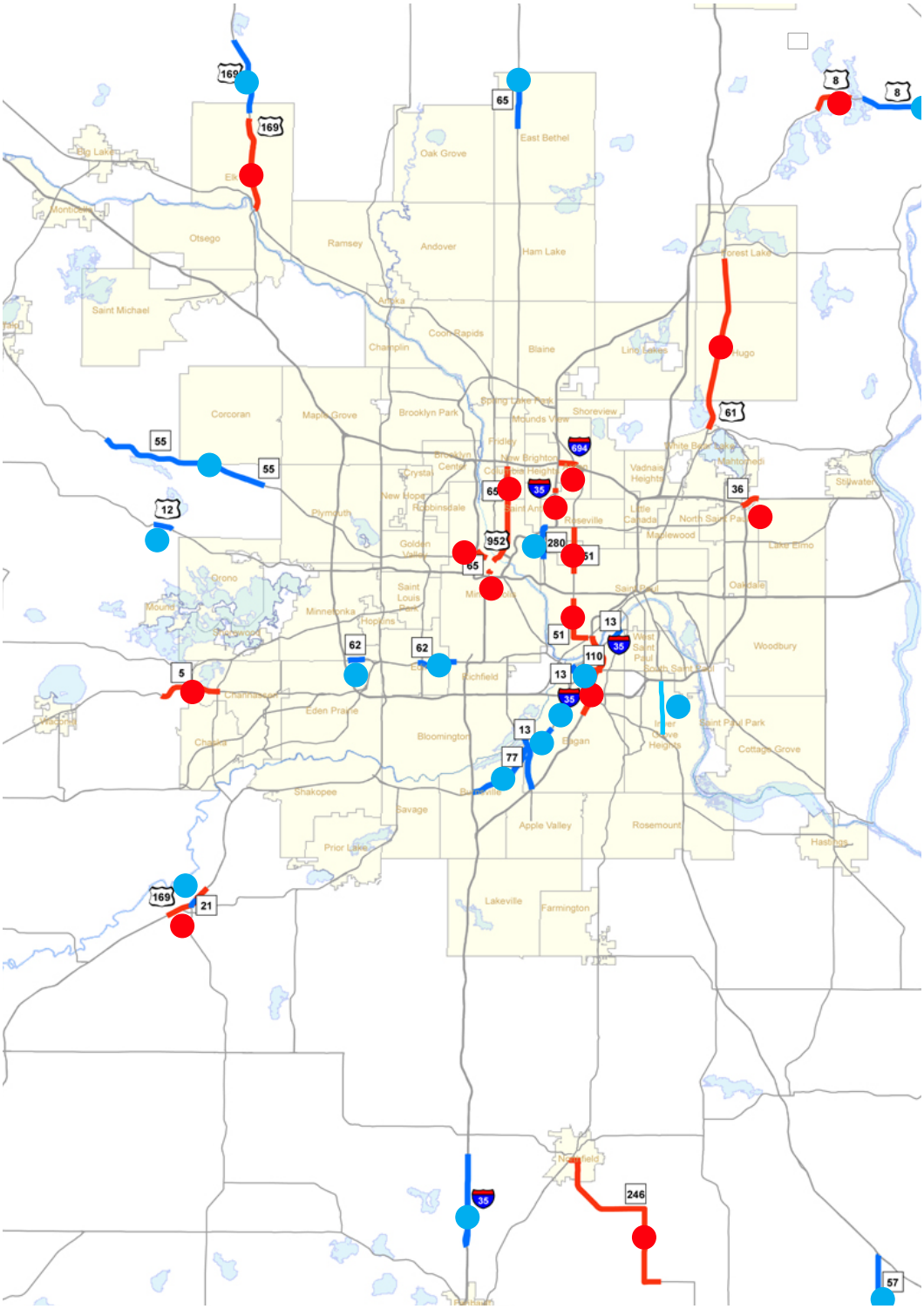


Figure 3-7: Metro Better Roads Pavement Projects and State Transportation Improvement Program Pavement Projects

Source: MnDOT, Better Roads for Minnesota

Bridge Conditions

On August 1, 2007 the I-35W bridge over the Mississippi River in Minneapolis collapsed. In 2008, the Minnesota State Legislature enacted legislation known as the Trunk Highway Bridge Improvement Program Chapter 152. Under this program, MnDOT developed a program for the accelerated repair and replacement of trunk highway bridges throughout the state, focusing on bridges classified as either structurally deficient or fracture critical. The program identified 172 bridges that met the program criteria. The status of these bridges as listed in the 2013 annual report was as follows:

- 76 bridges substantially complete (i.e., open to traffic)
- 13 bridges will be complete by the end of the 2013 construction season
- 53 bridges scheduled to be under contract for repair or replacement in 2014-2018
- 27 bridges judged toned only routine maintenance until beyond 2018
- 3 bridges are either privately owned or do not carry state trunk highway traffic

MnDOT uses a measure to assess system-wide trunk highway bridge performance. The measure is the Bridge Structural Condition Rating, which is based on the National Bridge Inventory (NBI) scale from 0 to 9 and uses a combination of Condition Code and Appraisal Rating to assign a good, fair, or poor condition.

While in the early 2000's the metro bridge ratings fell below the goal, by 2007 the Twin Cities region's bridges carrying principal arterials and non-principal arterials met the target established in MnDOT's state plan. However, the area of bridges carrying principal arterials that are in poor condition exceed the target. The area of bridges in the metro carrying non-principal arterials exceeds MnDOT's target.

Statewide, the bridges carrying principal arterials fail to meet MnDOT's target, but the non-principal bridges do meet the target for bridges in good condition.

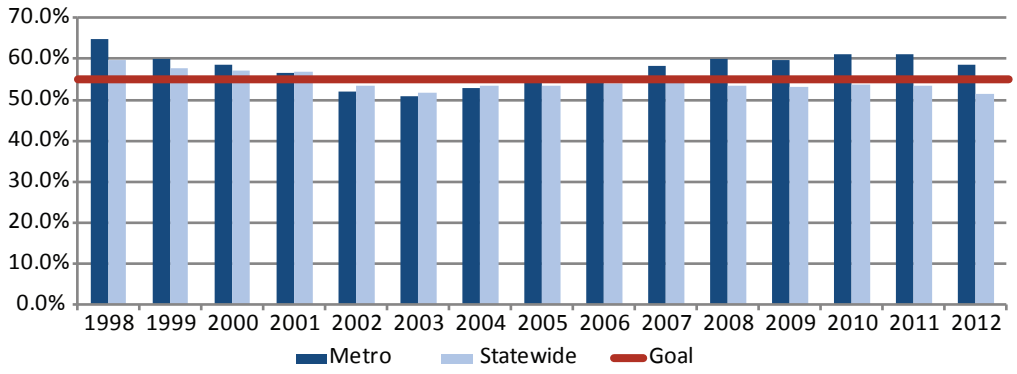


Figure 3-8: Percent Principal Arterial Bridge Area in Good Category
Preferred scores are above the goal (red line)

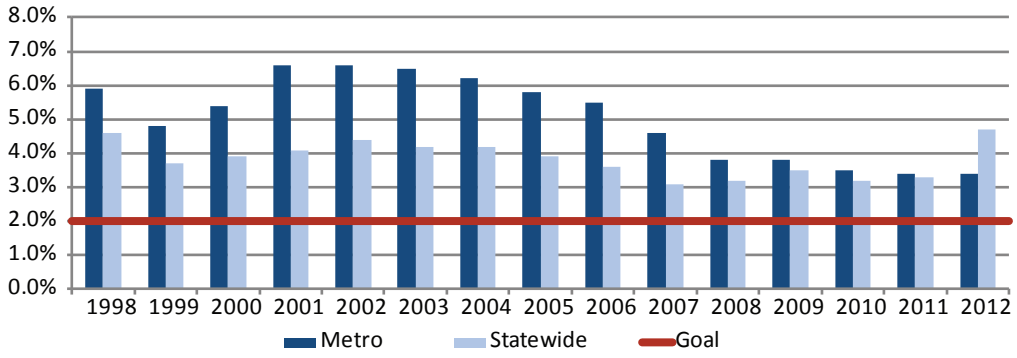


Figure 3-9: Percent Principal Arterial Bridge Area in Poor Category

Preferred scores are below the goal (red line)

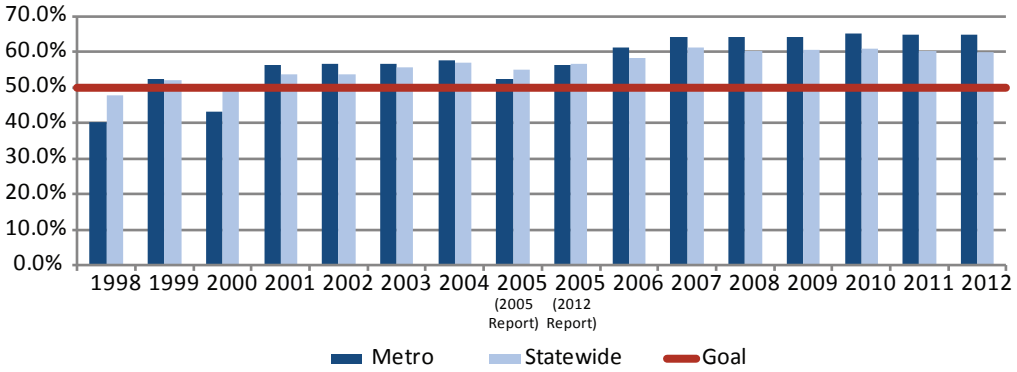


Figure 3-10: Percent Non-Principal Arterial Bridge Area in Good Category

Preferred scores are above the goal (red line)

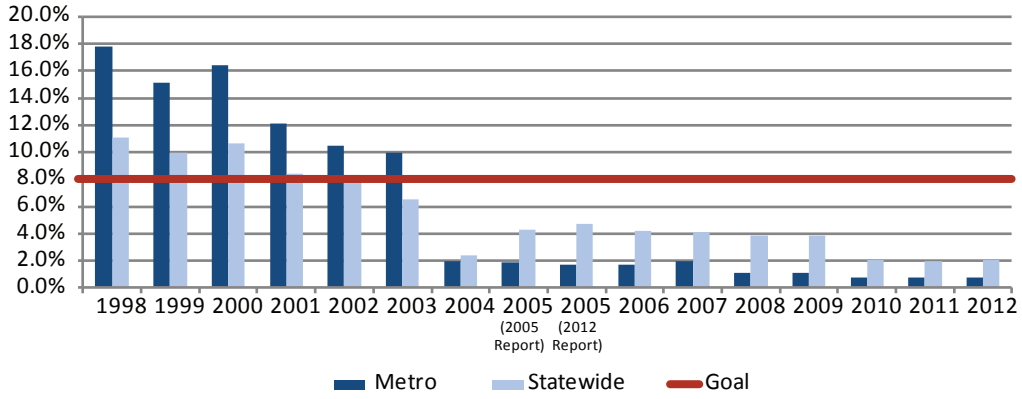


Figure 3-11: Percent Non-Principal Arterial Bridge Area in Poor Category

Preferred scores are below the goal (red line)

Use of the Highway System

The Twin Cities region had an estimated population of 2.8 million in 2010 (US Census). This is an increase of almost 8% since the 2000 census. Since 1980, the Twin Cities region's population has increased by more than 43%.

Over the same period (1980 to 2010) employment has grown faster than population. There were an estimated 1.5 million people employed in the region in 2010. This is a decline of almost 4% since 2000 and but an increase of almost 49% since 1980. This decline in employment between 2000 and 2010 has implications and impacts on many of the measures of highway use.

Vehicle-Miles Traveled

A typical measurement of road system usage is the daily vehicle-miles traveled (VMT), which is the number of miles driven by vehicles in the region. According to the Minnesota Department of Transportation, VMT has increased between 2000 and 2010 similar to the increases seen in previous decades.

Table 3-3: 2010 Vehicle-Miles Traveled by Functional Class - Seven-County Metro

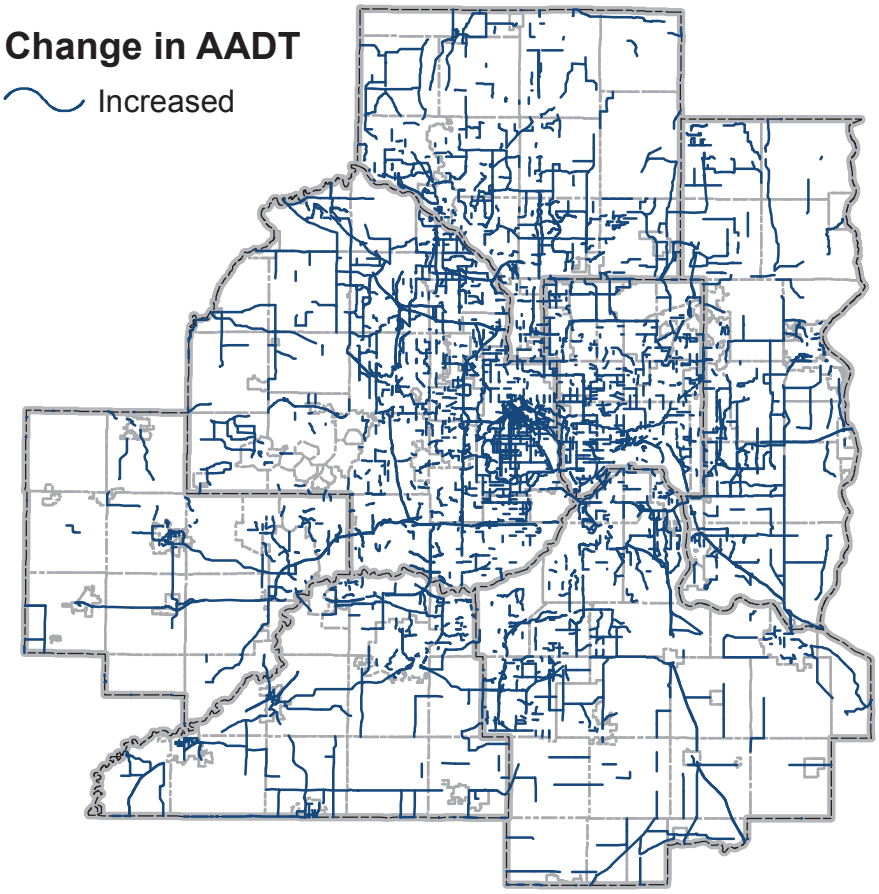
Functional Class	Miles
Principal Arterial - Freeway	29,870,155
Principal Arterial - Other	7,835,310
Minor Arterial	20,991,308
Collector	5,416,585
Local Systems	8,790,957
2010 Total	**72,904,315**
2000 Total	**67,229,583**
2000 – 2010 % Change	**8.4%**

Source: MnDOT

Freeway principal arterials carry a disproportionate amount of the vehicle traffic compared to other system roads. In the Twin Cities region, freeway principal arterials comprise of 5.3% of lane miles but carry 41% of the vehicle-miles traveled.

Recent trends have shown a reverse of this long-term trend. In terms of vehicle-miles-traveled, daily travel in 2010 is lower than any year from 2006 – 2009. This reduced VMT can be due to several factors, such as shorter trips, an increase in carpooling, conversion to other modes, the cost of gasoline, and the economy. VMT only decreases when people either decide to make fewer vehicle trips or by deciding not to make the trips at all. MnDOT data on traffic counts on the major roads in the region indicate that many of the roads show a decline in the number of vehicle trips they carry. Figure 3-12 shows those roads that experienced an increase or decline in traffic counts between 2005 and 2010. Of the roads that had AADT data to assess the change between the two years, almost 58% of the roadway miles (tabulated directionally) experienced a decline in AADT between 2005 and 2010.

The balance between freeway system and arterial street use has remained essentially constant between 1990 and 2010. In the 20 years between 1990 and 2010, daily VMT on the freeways has increased almost 59%, while daily VMT has increased just over 60% on arterial streets and total system VMT has



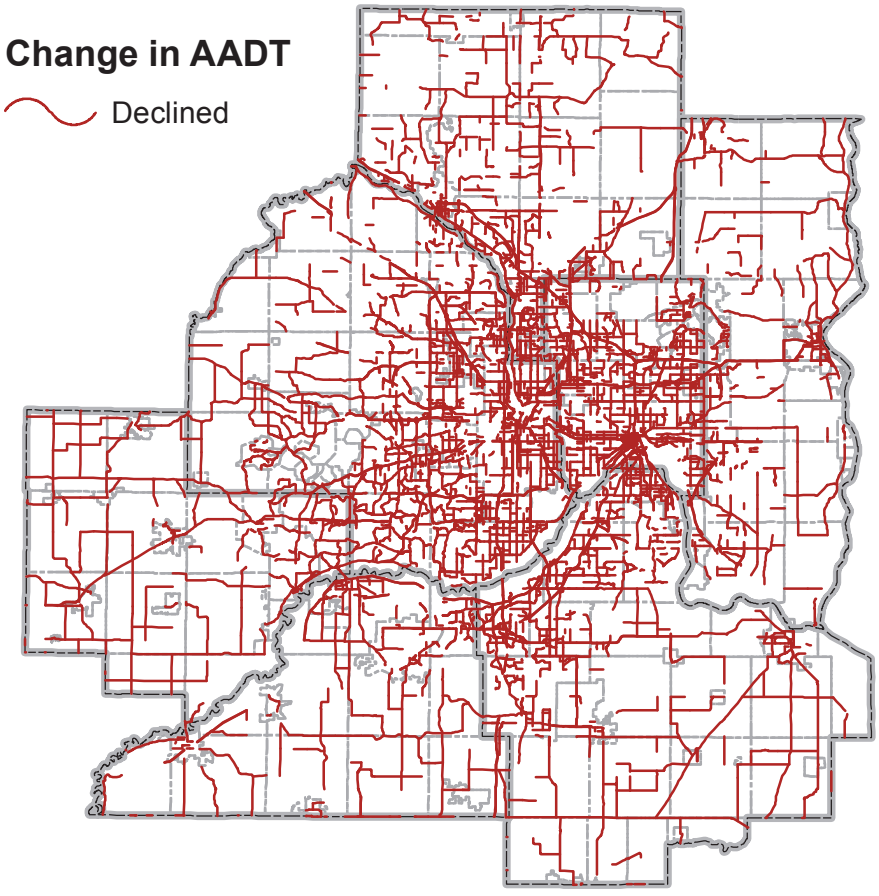


Figure 3-12: Change in AADT from 2005 to 2010

increased almost 60%. Almost all of this growth occurred during the 1990s, as VMT has remained relatively constant since 2000. Between 1990 and 2000, the system showed a growth in VMT of more than 49%, but from 2000 to 2010 the growth was just under 7%.

Daily VMT per person has increased from 16 in 1990 to a peak of almost 21 daily VMT per person in 2001 then dropping back down to more than 19 in 2010. Over the last decade, people have traveled about two miles more per person per day than in the region's peer regions and large cities. As the figures on next page show, daily VMT per person has declined over the last several years for the Twin Cities region and the in the region's peer cities.

The number of vehicle-miles traveled on roads in the Twin Cities region has been generally increasing constantly during the last 20 years. However, a couple of years late in the last decade did show an annual decline. Daily VMT has increased most considerably on principal arterials. Per capita daily VMT is higher in the Twin Cities than in peer regions and in other large cities.

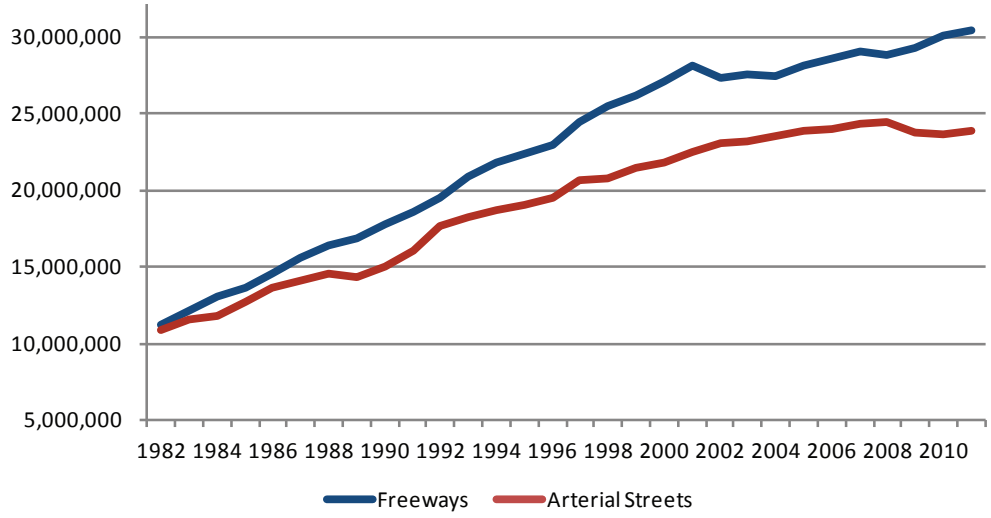


Figure 3-13: Daily Vehicle Miles Traveled - Twin Cities Area

Source: TTI 2011 Urban Mobility Report

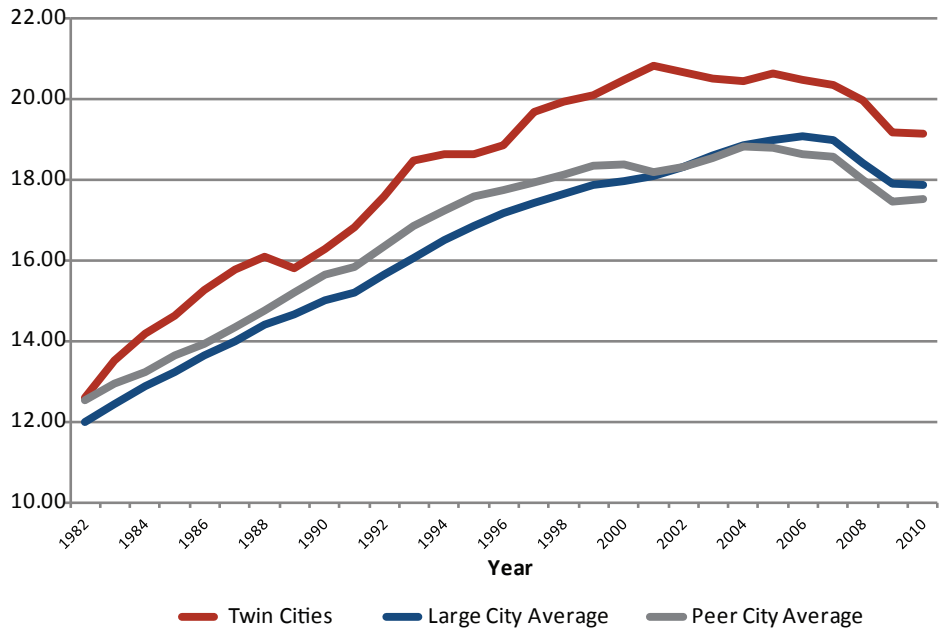


Figure 3-14: Daily VMT per Person

Source: TTI 2011 Urban Mobility Report

Peak Period Travelers

TTI data also show an increase in peak period travel in the Twin Cities region, a trend that has never been interrupted in the last several decades. Between 1990 and 2010, the number of travelers on the roadways during the peak period increased by 74%.

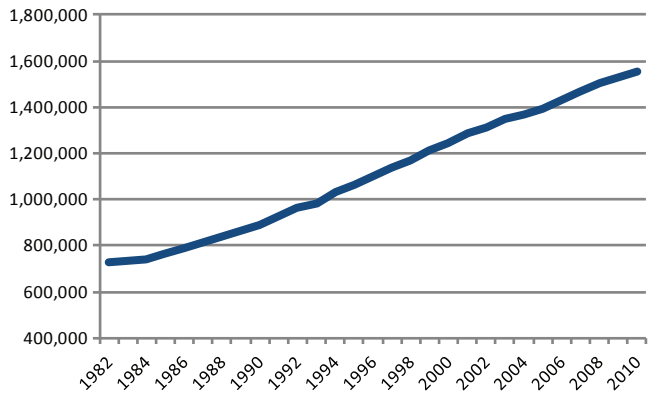


Figure 3-15: Peak Period Travelers

Source: TTI 2011 Urban Mobility Report

Truck Vehicle-Miles Traveled

The Minnesota Department of Transportation maintains data on daily truck (heavy commercial) miles traveled on trunk highways. In the seven-county metro area, truck miles have increased steadily for the past 15 years.

Table 3-4: Truck Vehicle Miles Traveled - Seven-County Metro

Year	Miles
1995	2,051,671
2000	2,149,382
2005	2,215,744
2010	2,320,686
Change: 1995 - 2010	**13.1%**
Change: 2000 - 2010	**8.0%**
Change: 2005 - 2010	**4.7%**

Daily Traffic on the Highway System

Average daily traffic (ADT) on the Twin Cities' highway system grew throughout the system during the last 20 years. The busiest segments of the highway system remained along I-94 and I-35, but traffic along them grew slower than or at a rate comparable to the rest of the system.

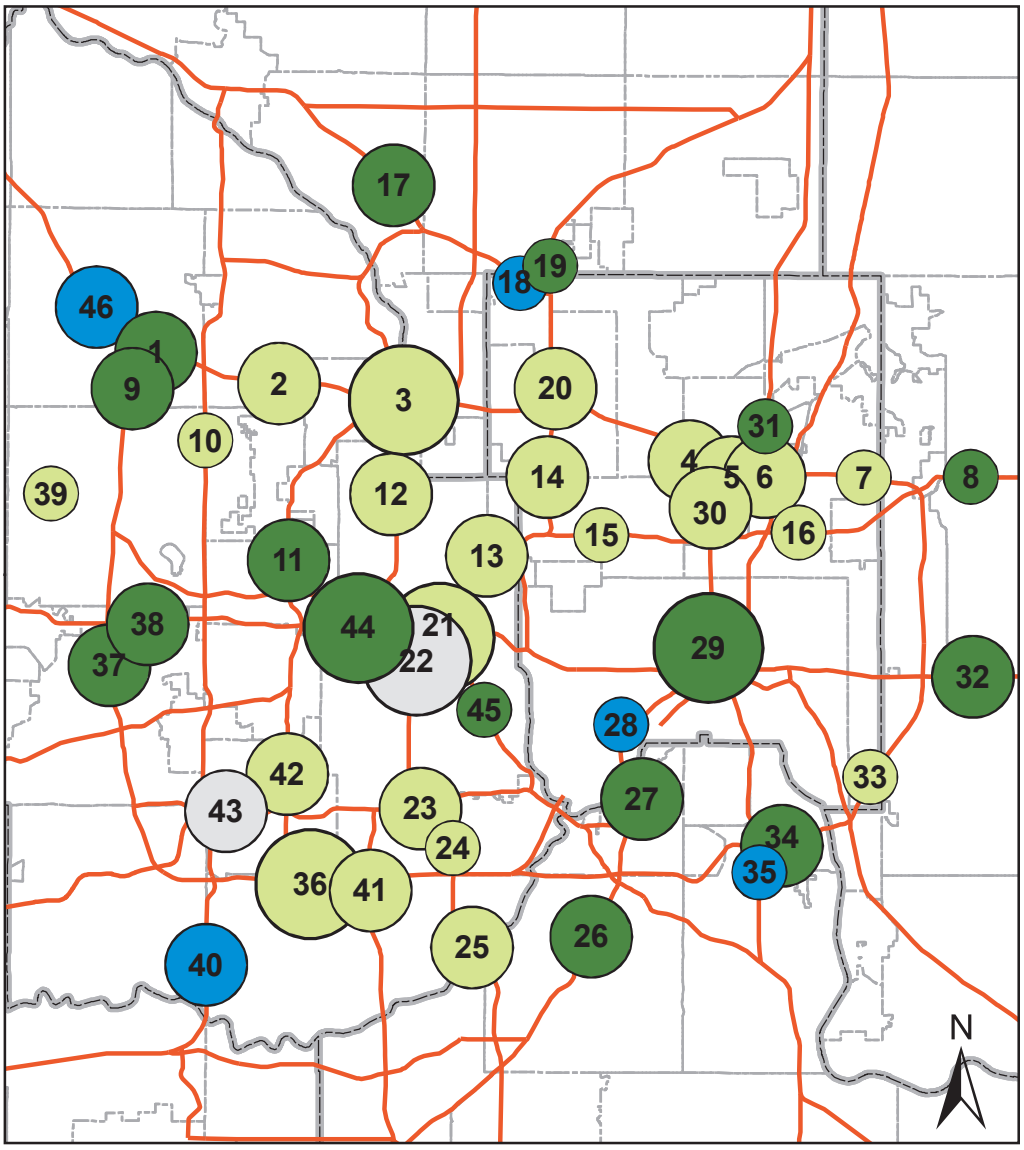


Figure 3-16: Daily Traffic Volume 1990 to 2010

Table 3-6: AADT for selected sites from Figure 3-16

Id	1990 AADT (1000s)	2010 AADT (1000s)	% Change
1	68	119	75%
2	91	109	20%
3	105	145	38%
4	71	101	42%
5	81	120	48%
6	59	84	42%
7	47	70	49%
8	24.5	39.5	61%
9	49.5	81	64%
10	64	77	20%
11	49	88	80%
12	96	115	20%
13	89	97	9%
14	87	100	15%
15	67	79	18%
16	46	54	17%
17	50	89	78%
18	18.5	74	300%
19	34.5	59	71%
20	89	107	20%
21	220	267	21%
22	171	158	-8%
23	79	81	3%
24	43	64	49%
25	65	90	38%
26	50	96	92%
27	46.5	80	72%
28	27	72	167%
29	92	145	58%
30	82	101	23%
31	44	75	70%
32	50	89	78%
33	44	59	34%
34	62	93	50%
35	16	61	281%
36	130	164	26%
37	61	106	74%
38	53	100	89%
39	27	38	41%
40	20.5	80	290%
41	105	106	1%
42	84	111	32%
43	87	82	-6%
44	81	143	77%
45	24.5	38	55%
46	55	112	104%

Crashes and Fatalities

Based on historical information, crashes on the trunk highway system have remained relatively constant, though they have shown a distinct decline between 2005 and 2010. While some of the decline may be attributed to the decline in VMT discussed earlier in this section, the magnitude of the decline in crashes is significantly greater than the decline in VMT.

Table 3-5: Crashes on Trunk Highway System Seven-County Area

2005	2010	Percent Change in Crashes	Percent Change in VMT
19,420	16,756	-14%	-2%

The greater rate of decline in crashes over the five-year period has resulted in a decrease in the crash rate on trunk highways in the metro area from 1.26 per million vehicle-miles in 2005 to 1.11 per million vehicle-miles in 2010.

In 2004, several state agencies joined with Federal Highway Administration, the University of Minnesota Center for Transportation Studies and Minnesota county engineers in the Toward Zero Deaths partnership. The mission of the

partnership focuses on education, engineering, enforcement, and emergency medical services.

The Twin Cities region has seen a decline in the number of fatal crashes over the five-year period.

Table 3-7: Fatal Crashes in Seven-County Metro

2005		2010		Percent Change ('05-'10)	
Trunk Hwy	All Roads	Trunk Hwy	All Roads	Trunk Hwy	All Roads
68	155	38	97	-44%	-37%

Current Highway Management Programs

HOV Lanes

One strategy to improve highway system performance is to make carpooling, transit and other high-occupant vehicle modes more appealing. To this end, the region currently operates two demand-sensitive High-Occupancy Toll (HOT) lanes with preference still given to buses, carpools and motorcycles. One is located on I-394 and the other on I-35W between Burnsville and downtown Minneapolis. The I-394 lane was an HOV lane and converted to a HOT lane in 2005. The I-35W lane also started as an HOV lane, but was extended and converted to a HOT lane through a project funded by the federal Urban Partnership Agreement (UPA) program. The following tables describe HOV usage at select points along I-394 and I-35W after the MnPass HOT lanes went into effect for the years 2000 and 2010. Another purpose of the toll-lanes is to provide a congestion-free option for high-occupant vehicles or willing to pay for it.

On I-394 eastbound at both Penn Ave and Louisiana Ave. in the AM peak period both the number of vehicles and the number of people moved in the MnPASS lane have increased between 2000 and 2010. Over the same period, the number of vehicles and people in the general purpose lanes have declined. This same trend is also exhibited on I-35W northbound at the Minnesota River in the AM peak period.

Table 3-8: I-394 (Eastbound at Penn Ave.) in AM Peak Period (0600-0900)	2000 (2nd Qtr)	2010 (2nd Qtr)
Vehicles Moved		
In MnPass Lane	3,198	4,490
In General Purpose Lanes	16,516	14,963
In all Lanes	19,714	19,453
People Moved in Autos		
In MnPass Lane	9,625	11,562
In General Purpose Lanes	16,784	15,211
In All Lanes	26,409	26,772
Number of Buses Using Facility	**115**	**171**
People in Buses	**3,276**	**4,763**
Percent of Vehicles in MnPass Lane	**16.2%**	**23.1%**
Percent of People in MnPass Lane	**43.5%**	**51.8%**

Table 3-9: I-394 (Westbound at Penn Ave.) in PM Peak Period (1500-1800)	2000 (2nd Qtr)	2010 (2nd Qtr)
Vehicles Moved		
In MnPass Lane	3,390	3,981
In General Purpose Lanes	17,025	17,680
In all Lanes	20,415	21,661
People Moved in Autos		
In MnPass Lane	9,708	10,660
In General Purpose Lanes	18,019	18,709
In All Lanes	27,729	29,368
Number of Buses Using Facility	**108**	**164**
People in Buses	**2,890**	**4,355**
Percent of Vehicles in MnPass Lane	**16.6%**	**18.4%**
Percent of People in MnPass Lane	**41.1%**	**44.5%**

Table 3-10: I-394 (Eastbound at Louisiana Ave.) in AM Peak Period (0600-0900)	2000 (2nd Qtr)	2010 (2nd Qtr)
Vehicles Moved		
In MnPass Lane	2,273	2,625
In General Purpose Lanes	11,379	10,989
In all Lanes	13,652	13,514
People Moved in Autos		
In MnPass Lane	6,173	7,070
In General Purpose Lanes	11,948	11,539
In All Lanes	18,121	18,609
Number of Buses Using Facility	**67**	**115**
People in Buses	**1,761**	**3,204**
Percent of Vehicles in MnPass Lane	**16.6**	**19.4%**
Percent of People in MnPass Lane	**40%**	**47%**

Table 3-11: I-394 (Westbound at Winnetka Ave.) in PM Peak Period (1500-1800)	2000 (2nd Qtr)	2010 (2nd Qtr)
Vehicles Moved		
In MnPass Lane	2,351	1,930
In General Purpose Lanes	13,641	15,823
In all Lanes	15,992	17,753
People Moved in Autos		
In MnPass Lane	6,112	5,753
In General Purpose Lanes	15,031	17,431
In All Lanes	21,143	23,184
Number of Buses Using Facility	**63**	**110**
People in Buses	**1,602**	**2,861**
Percent of Vehicles in MnPass Lane	**14.7%**	**10.9%**
Percent of People in MnPass Lane	**33.9%**	**33.1%**

Table 3-12: I-35W (Northbound at Minnesota River.) in AM Peak Period (0600-0900)	2000 (2nd Qtr)	2010 (2nd Qtr)
Vehicles Moved		
In MnPass Lane	2,233	2,521
In General Purpose Lanes	13,260	11,558
In all Lanes	15,493	14,079
People Moved by Auto		
In MnPass Lane	4,948	5,022
In General Purpose Lanes	13,638	11,892
In All Lanes	18,587	16,914
Number of Buses Using Facility	**34**	**53**
People in Buses	**1,132**	**1,483**
Percent of Vehicles in MnPass Lane	**14.4%**	**17.9%**
Percent of People in MnPass Lane	**30.8%**	**35.4%**
People Moved per Lane		
MnPASS Lane (Auto + Bus)	6,080	6,505
General Purpose Lanes	6,819	5,946

Table 3-13: I-35W (Northbound at Lake Street) in AM Peak Period (0600-0900)	2009 (4th Qtr)	2010 (2nd Qtr)
Vehicles Moved		
In MnPass Lane	618	690
In General Purpose Lanes	16,271	18,037
In All Lanes	16,889	18,727
People Moved in Autos		
In MnPass Lane	2667	4,244
In General Purpose Lanes	16,752	18,575
In All Lanes	19,419	22,819
Number of Buses Using Facility	**94**	**150**
People in Buses	**2,573**	**4,132**
Percent of Vehicles in MnPass Lane	**3.7%**	**3.7%**
Percent of People in MnPass Lane	**23.8%**	**31.1%**
People Moved per Lane		
MnPASS Lane (Auto + Bus)	5,240	8,376
General Purpose Lanes	4,188	4,644

Table 3-14: I-35W (Southbound at Minnesota River.) in PM Peak Period (1500-1800)	2000 (2nd Qtr)	2010 (2nd Qtr)
Vehicles Moved		
In MnPass Lane	2,650	2,384
In General Purpose Lanes	12,341	13,878
In All Lanes	14,991	16,262
People Moved in Autos		
In MnPass Lane	5,509	5,464
In General Purpose Lanes	13,650	15,349
In All Lanes	19,159	20,813
Number of Buses Using Facility	**32**	**44**
People in Buses	**1,037**	**1,268**
Percent of Vehicles in MnPass Lane	**17.7%**	**14.7%**
Percent of People in MnPass Lane	**32.4%**	**30.5%**
People Moved per Lane		
MnPASS Lane (Auto + Bus)	6,546	6,732
General Purpose Lanes	6,825	7,675

Another indicator of the usage of the I-394 HOV lane is the use of the Third Avenue Distributor (TAD) garages. These are the garages constructed in the northwest area of Downtown Minneapolis at the eastern end of I-394. The number of HOV contracts generally peaked in the late 1990s to early 2000s at around 2,200 contracts. Since 2002, the number of HOV contracts has been dropping. The overall use of the garages peaked in 2001 and has been in a general decline since that point. The portion of the monthly contracts that were HOVs was strongest when the garages first opened, constituting roughly two-thirds of the contracts. By 2010 that relationship had reversed, with HOV contracts only accounting for one-third of all contracts.

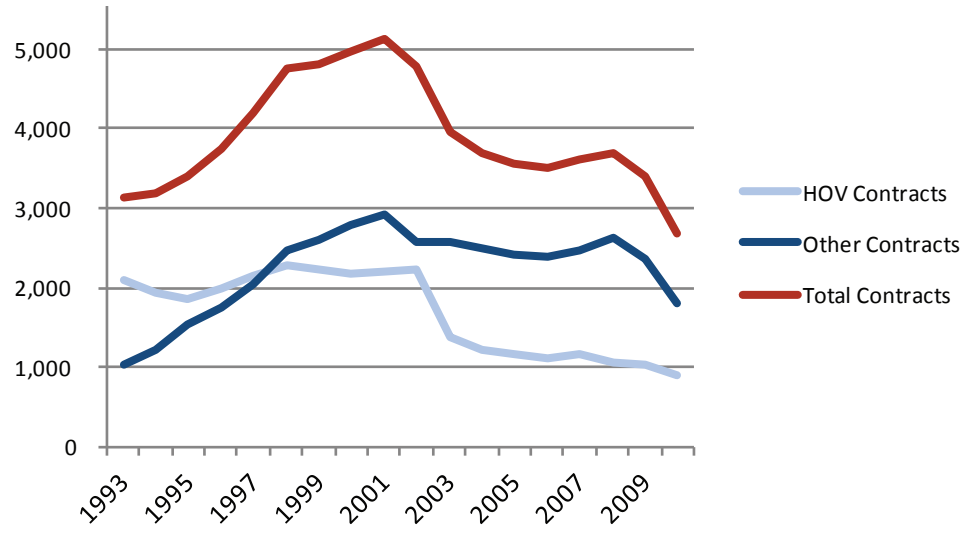


Figure 3-17: Average Monthly Carpool Parking Contracts – 1993 to 2010

The ability of the HOT lanes to provide travel time advantages for HOV users, buses and tolled vehicles can be assessed by comparing the average peak period speeds in those tolled lanes versus the adjoining general purpose lanes.

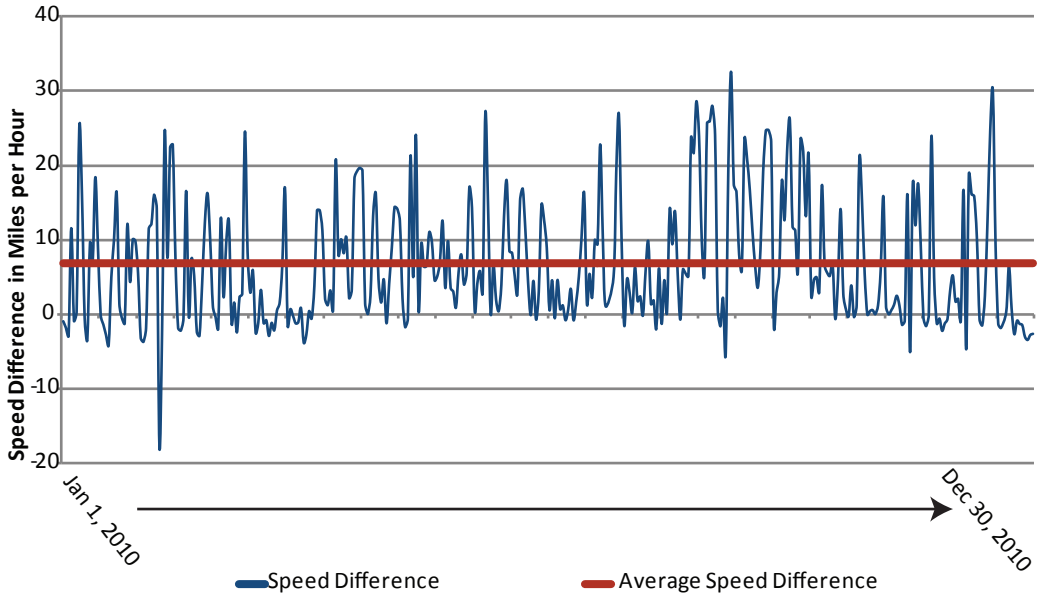


Figure 3-18: Speed Difference HOV to General Purpose Lane Average Speeds, 2010, AM Peak, I-394 Eastbound at Penn Ave

Note: Speed difference values of less than zero indicate a period when the average speed in the HOV managed lane was lower than that in the general purpose lanes.

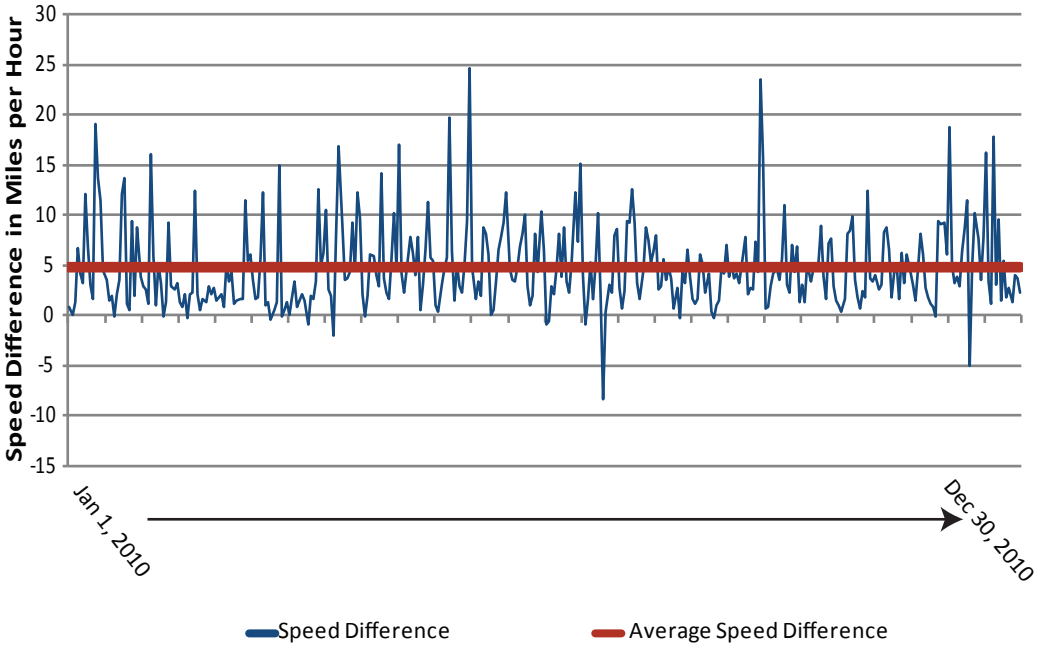


Figure 3-19: Speed Difference HOV to General Purpose Lane Average Speeds, 2010, PM Peak, I-394 Westbound at Penn Ave

Note: Speed difference values of less than zero indicate a period when the average speed in the HOV managed lane was lower than that in the general purpose lanes.

Ramp Metering

MnDOT installed the first ramp meters in the Twin Cities region on I-35E in St. Paul in 1969. They now have 433 ramp meters in the Twin Cities region to manage freeways in the Twin Cities region so that they move more smoothly and maintain high-average speeds throughout the system. In 2000, MnDOT conducted a study of the effectiveness of the ramp meters in the region involving the shutdown of the ramp-meter system. The study reported the following summary of the annual benefits of ramp metering:

- Traffic Volumes and Throughput: After the meters were turned off, there was an average of a 9% traffic-volume reduction on freeways and no significant traffic-volume change on parallel arterials included in the study. Also during peak-traffic conditions, freeway mainline throughput declined by an average of 14% in the "without meters" condition.
- Travel Time: Without meters, the decline in travel speeds on freeway facilities more than offsets the elimination of ramp delays. This results in annual system-wide savings of 25,121 hours of travel time with meters.
- Travel-Time Reliability: Without ramp metering, freeway travel time is almost twice as unpredictable as with ramp metering. The ramp metering system produces an annual reduction of 2.6 million hours of unexpected delay.
- Safety: In the absence of metering and after accounting for seasonal variations, peak period crashes on previously metered freeways and ramps increased by 26%. Ramp metering results in annual savings of 1,041 crashes or approximately four crashes per day.
- Emissions: Ramp metering results in net annual savings of 1,160 tons of emissions.
- Fuel Consumption: Ramp metering results in an annual increase of 5.5 million gallons of fuel consumed. This was the only criteria category that worsened by ramp metering.
- Benefit/Cost Analysis: Ramp metering results in annual savings of approximately $40 million to the Twin Cities traveling public. The benefits of ramp metering out-weigh the costs by a significant margin and result in a net benefit of $32 million to $37 million per year. The benefit/cost ratio indicates that benefits are approximately five times greater than the cost of entire congestion management system and more than 15 times greater than the cost of the ramp metering system alone.

Vehicle Occupancy

Increases in employment, decreases in household size and increases in the overall population of the region have driven the growth in the demand on the highway system. However, another reason that vehicle-miles traveled has increased over the long term is that the average number of people in a vehicle declined.

Vehicle occupancy declined steadily in the years preceding the 1980s. During the 1980s, vehicle occupancy remained practically unchanged. The 1990s saw a reversal of this trend with more people making non-work trips in vehicles with more than one person. Work-trip vehicle occupancy peaked in 1970 at 1.19 passengers per vehicle and has steadily declined to the point where it was just 1.05 in 2000. Both the dispersion of work sites and the decline in household size have made car-pooling more. The Twin Cities regional travel demand model of the Metropolitan Council predicts average vehicle occupancy to increase modestly in the next 25 years.

Table 3-15: Average Vehicle Occupancy

Trip Purpose	1970	1982	1990	2000	2030
Home Based Work Related	1.21	1.15	1.07	1.05	1.10
Home Based Other	1.69	1.40	1.38	1.51	1.55
Non-Home Based Work	1.50	1.24	1.09	1.09	1.16
Average	**1.51**	**1.30**	**1.29**	**1.35**	**1.52**

Source: Metropolitan Council

Congestion

In assessing the performance of the freeway system, MnDOT has embedded detectors that measure the speed of traffic. Free-flow conditions are speeds above 45 miles per hour and speeds below that are deemed congested. MnDOT calculates the percentage of miles on the freeway system that operate at speeds lower than this for any length of time. Tracking trends in congestion over time is difficult using the MnDOT data since the data-collection methods have been altered at various points prior to 2002 and because the usage of detectors has been expanding over time. However, the data shows the same trend as the TTI data with congestion increasing considerably during the 1990s and leveling off somewhat during the early 2000s. The miles of congestion declined between 2007 and 2008, but then rose again the following two years.

In the Urban Mobility Report, TTI estimates the annual cost imposed by congestion. In 2010, the estimate for the Minneapolis-St. Paul region was $916 annually per auto commuter. For comparison, the average for the peer city's was just under $744 and $642 for large areas (as defined by TTI). Figure 3-21 illustrates the trend between 1982 and 2010. Between 1982 to 2006, the annual cost showed a continuous rise, but then a significant drop for 2007.

Table 3-16: Miles of Directional Congestion (AM Plus PM)

	Early 2000	Late 2000	2002	2003	2004	2005	2006	2007	2008	2009	2010
Severe	41	125	70	83	72	83	64	82	51	55	82
Moderate	68	93	84	105	105	94	97	112	104	107	127
Low	105	82	101	106	104	101	107	111	108	114	117
Total*	**214**	**300**	**255**	**293**	**280**	**277**	**267**	**305**	**263**	**276**	**326**

**Total may not equal Severe +Moderate + Low due to rounding.*

Source: MnDOT Metropolitan Freeway System 2010 Congestion Report

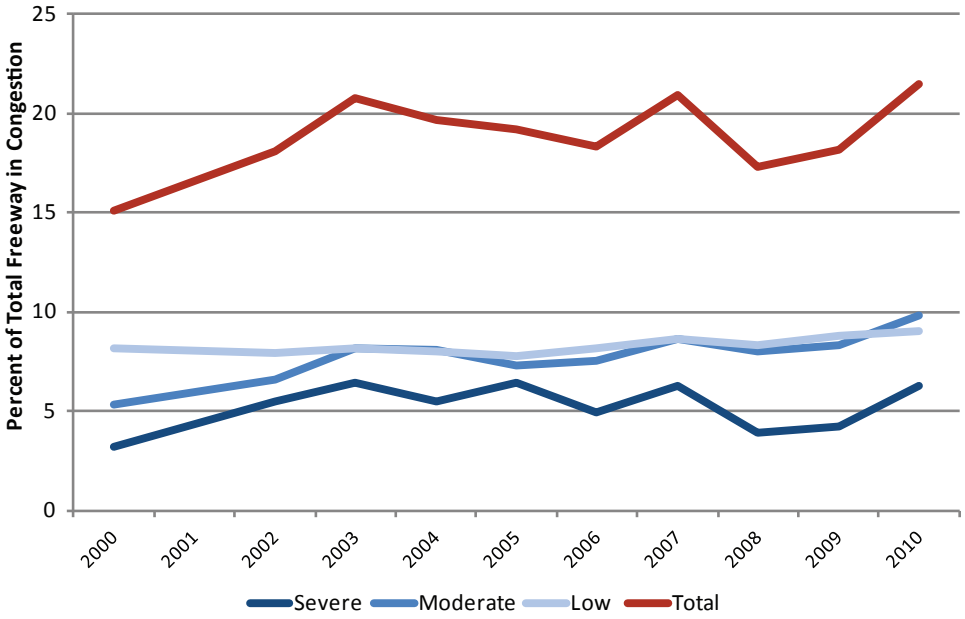


Figure 3-20: Percent of Miles of Directional Congestion (AM Plus PM)

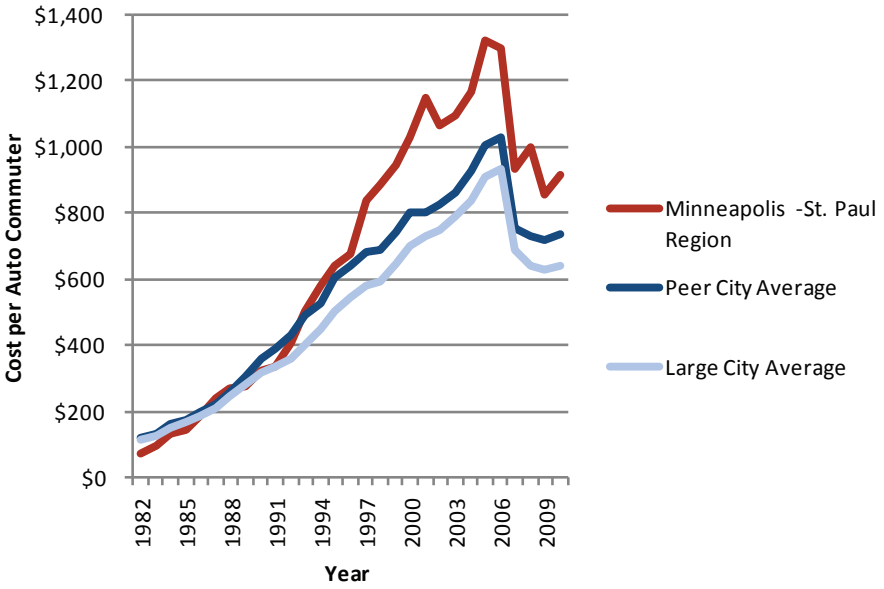


Figure 3-21: Annual Cost of Congestion 1982 – 2010 per Auto Commuter

Since 2007, TTI has also been estimating the annual cost of congestion on trucks.

Table 3-17: Annual Truck Congestion Cost ($millions)

Year	Minneapolis – St. Paul Region	Peer City Average	Large Area Average
2007	$300	$275	$148
2008	$305	$265	$135
2009	$288	$287	$149
2010	$300	$289	$148

The cost of congestion significantly affects not only the commuters of the region, but also the region's economic competitiveness. Congestion costs on trucks are higher than the average of the peer regions and generally twice that of the TTI average for large cities.

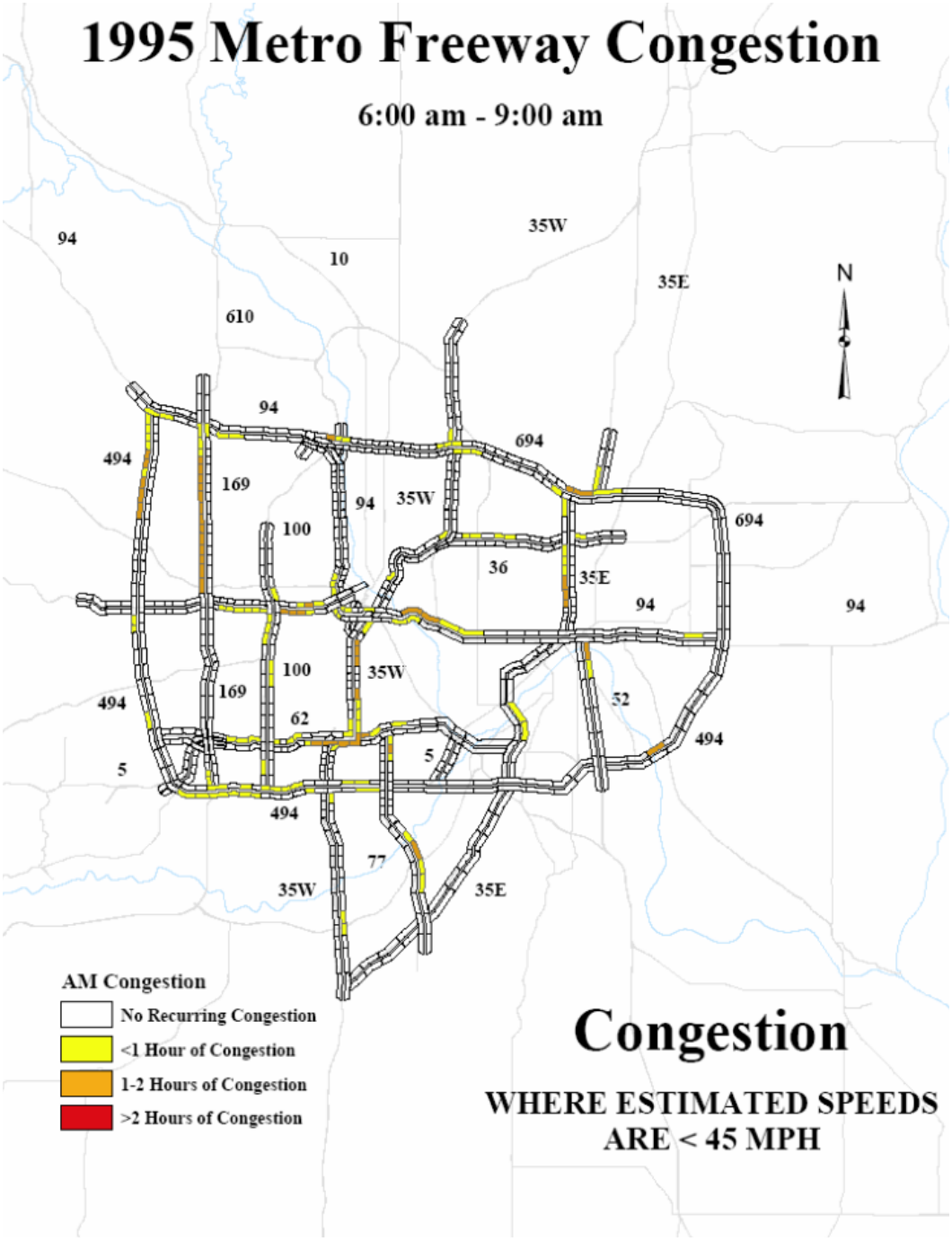


Figure 3-22: 1995 AM Congestion

Source: MnDOT

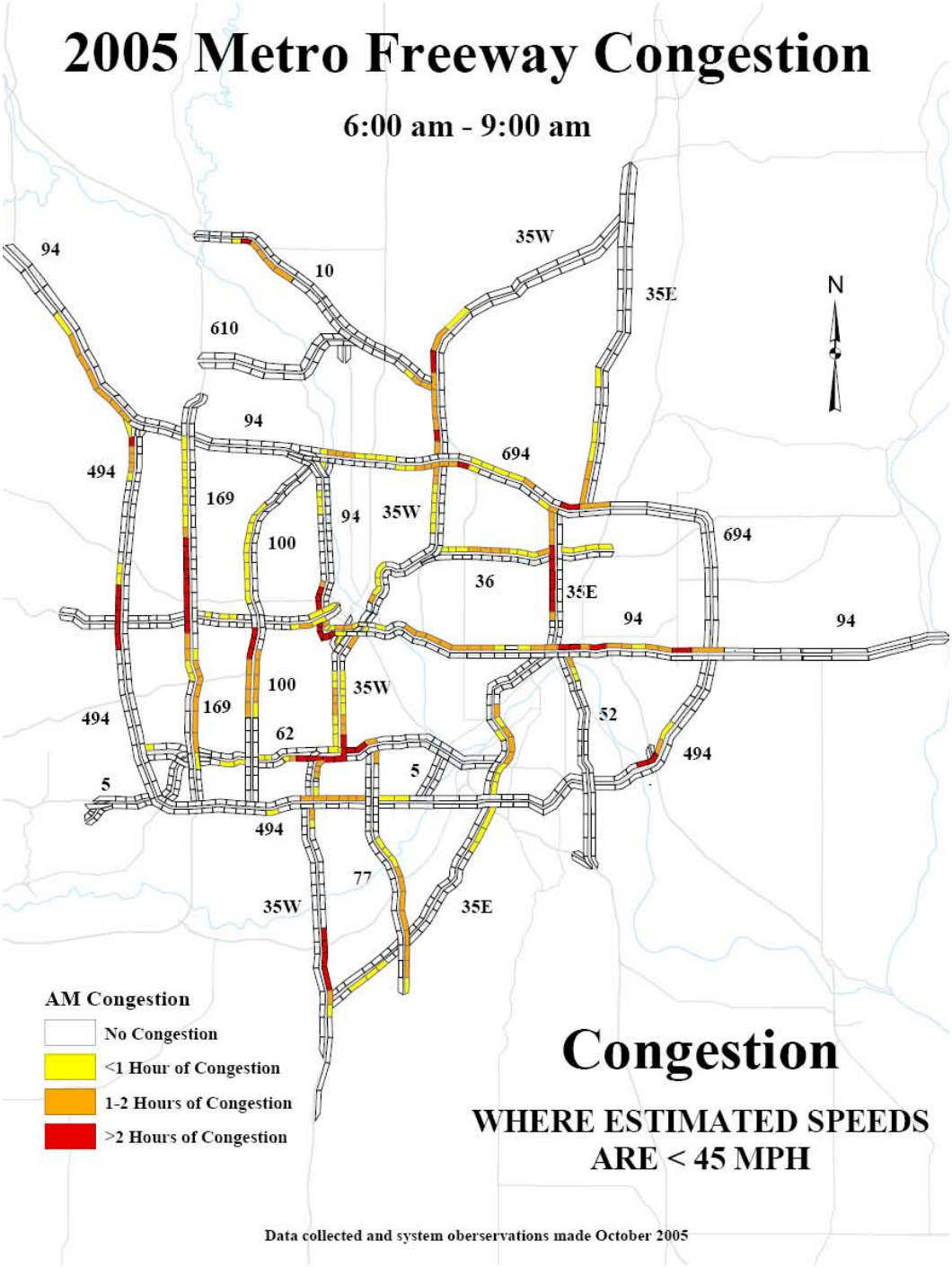


Figure 3-23: 2005 AM Congestion

Source: MnDOT 2005 Congestion Report

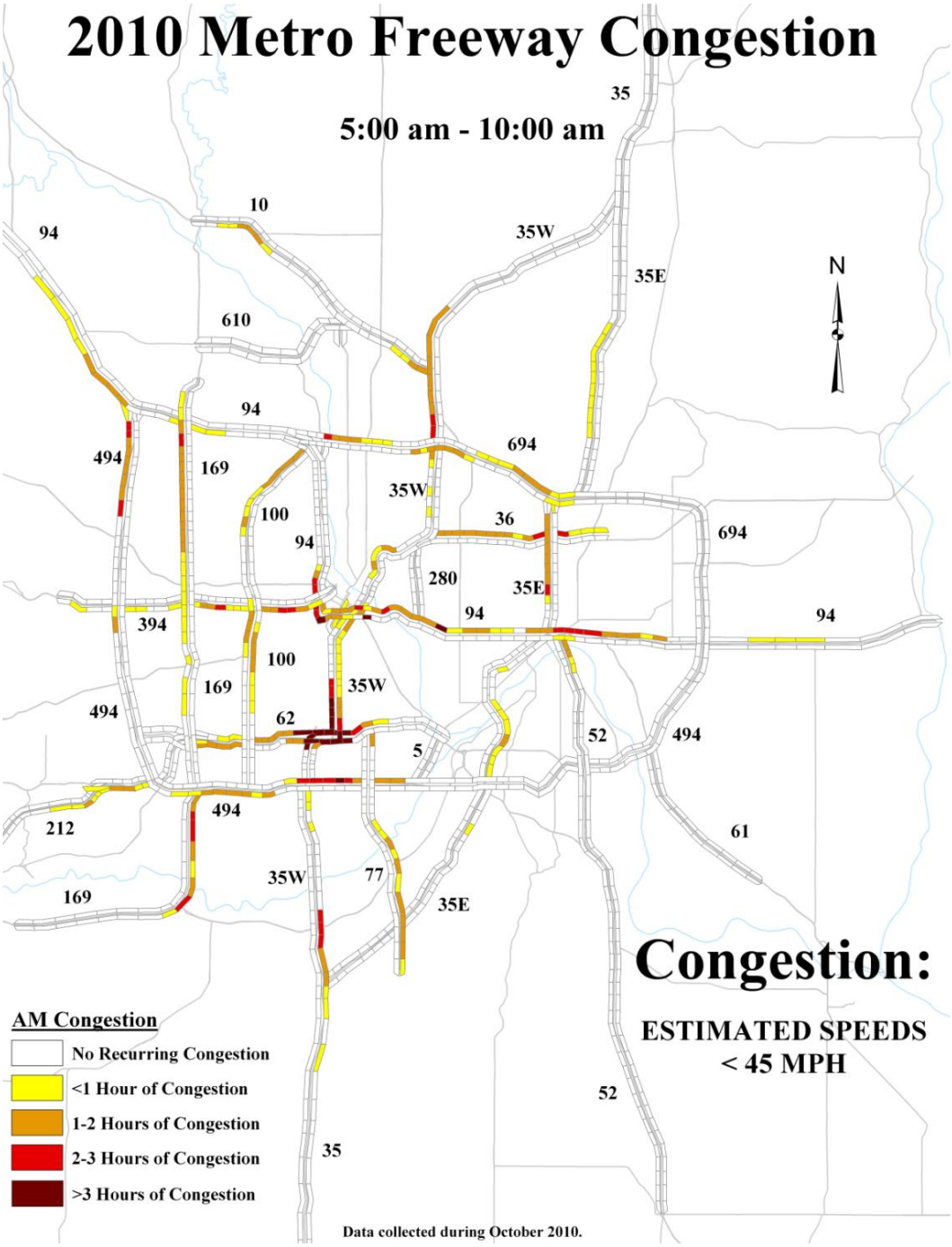


Figure 3-24: 2010 AM Congestion

Source: MnDOT 2010 Congestion Report

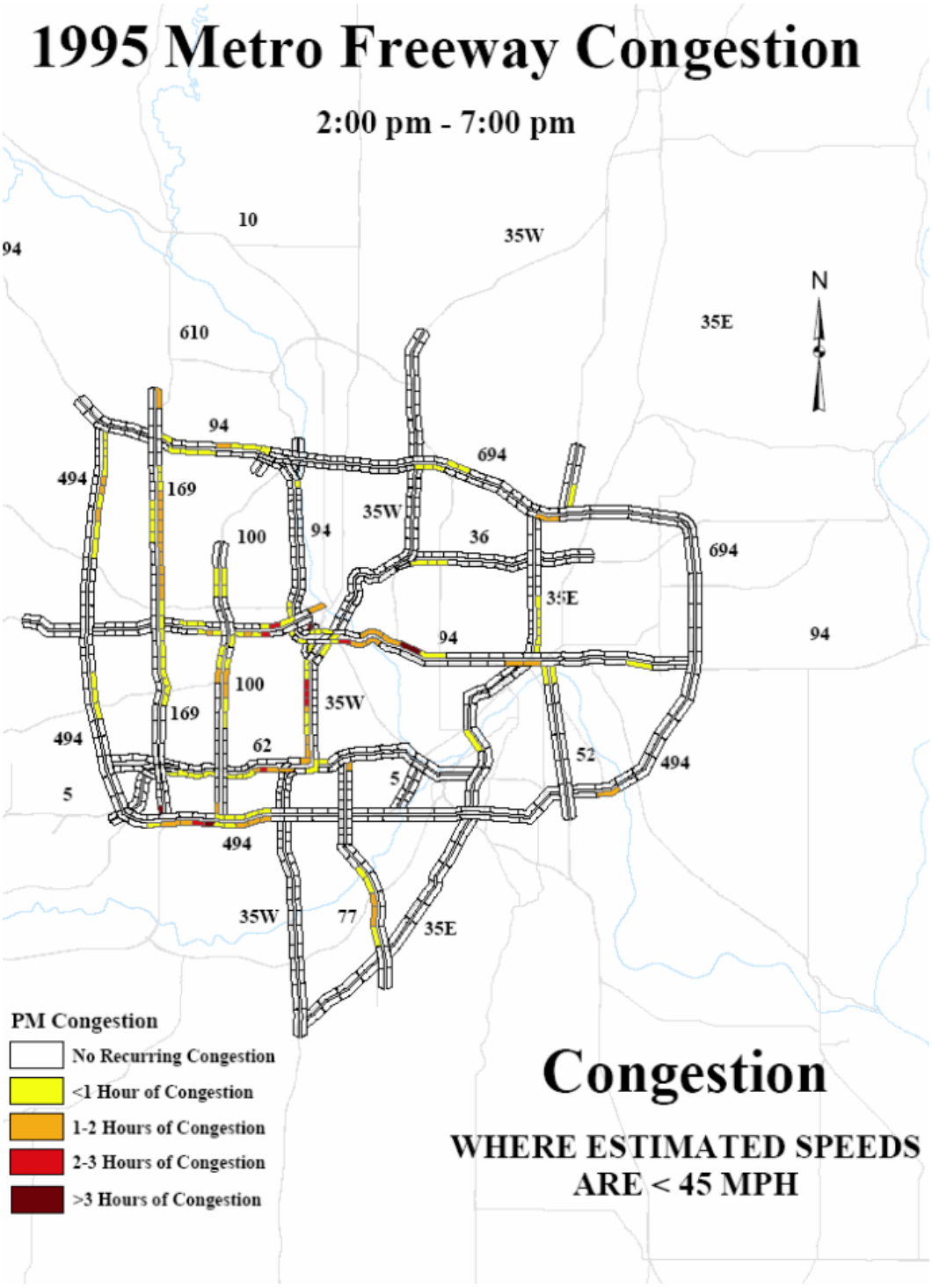


Figure 3-25: 1995 PM Congestion

Source: MnDOT

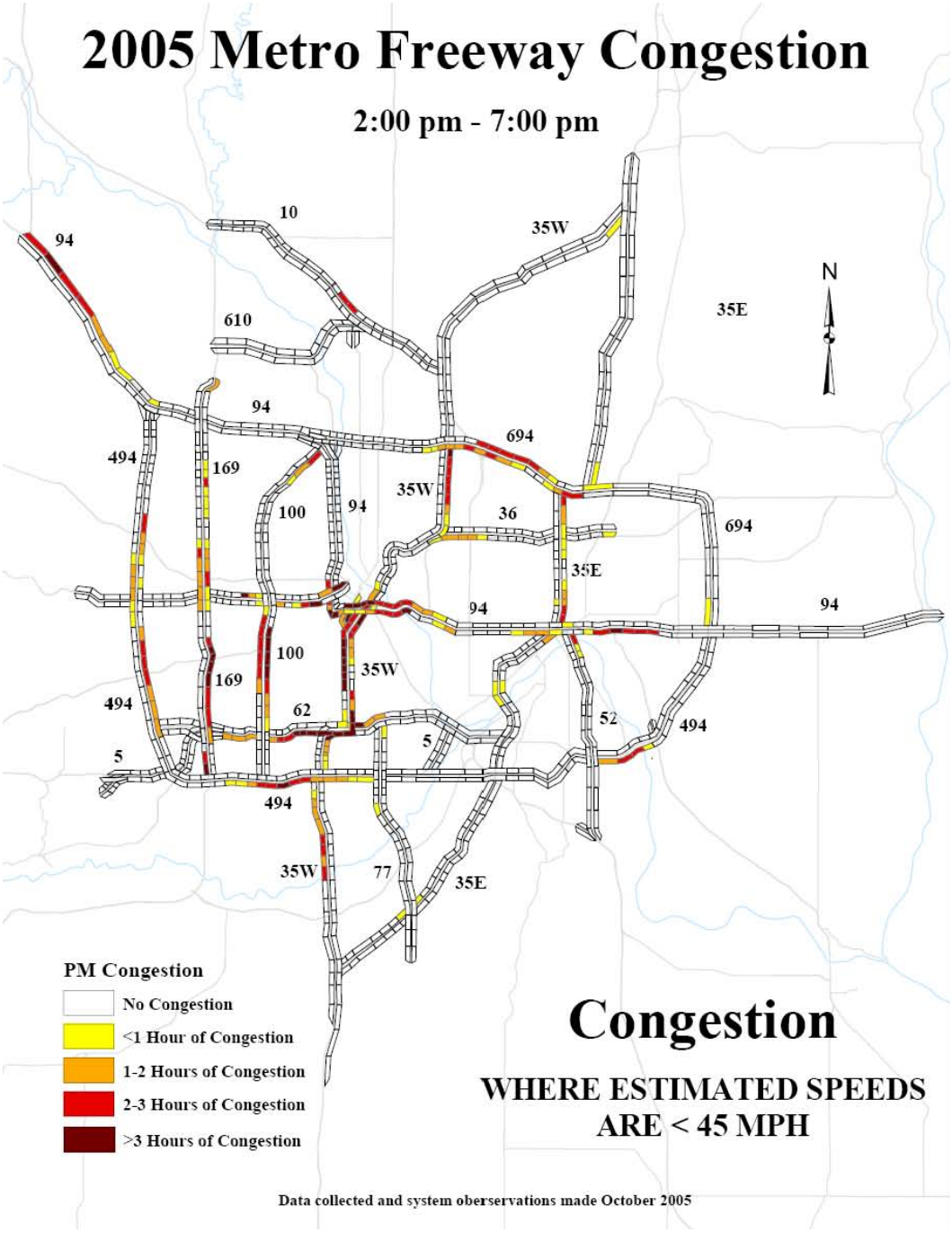


Figure 3-26: 2005 PM Congestion

Source: MnDOT 2005 Congestion Report

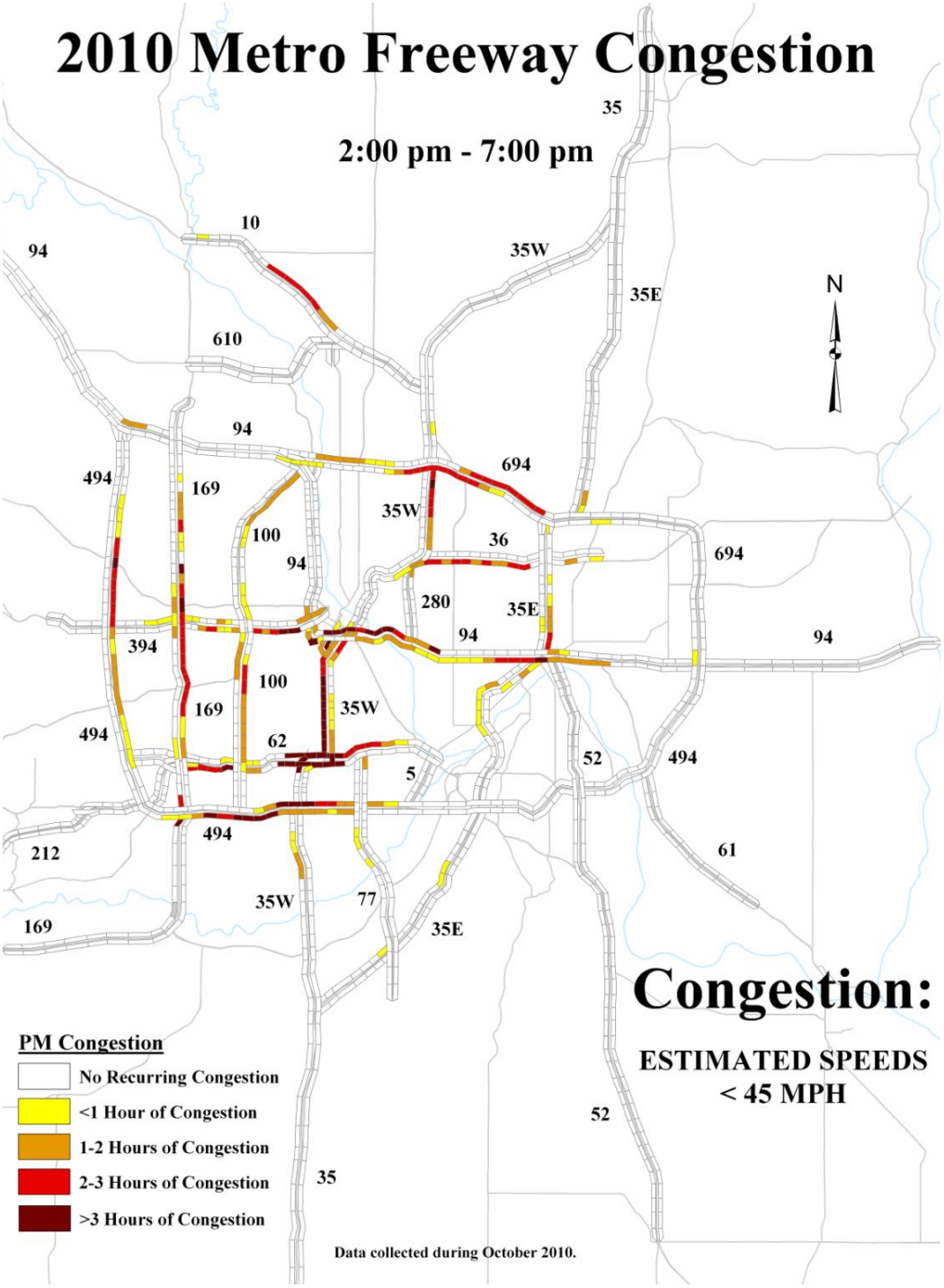


Figure 3-27: 2010 PM Congestion

Source: MnDOT 2010 Congestion Report

Traveler's Time Spent in Delay

More important than the number of miles of congestion is the amount of time spent in congestion. In 2010, the average Twin Cities auto commuter spent 45 hours delayed in traffic. Among the 11 peer urban areas, the Twin Cities went from tenth in 2000 to ninth in 2010 in terms of hours of delay per capita.

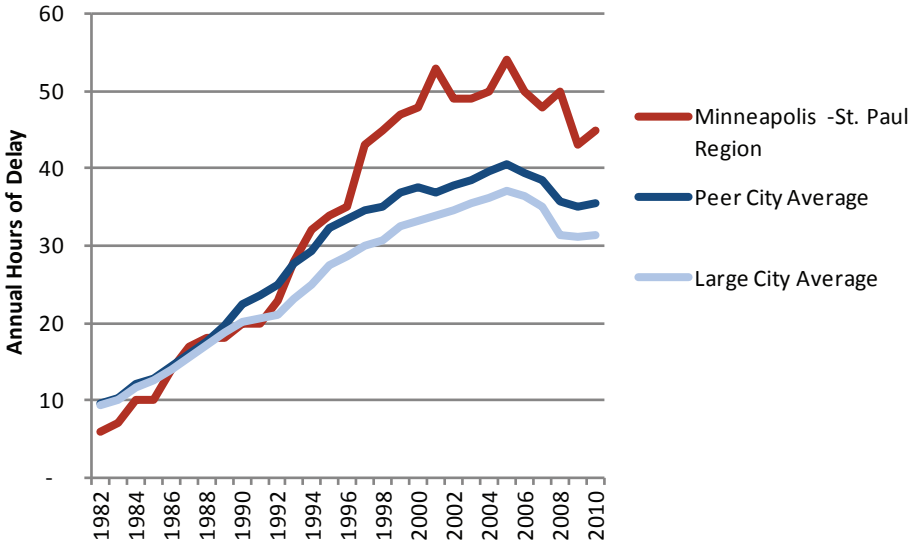


Figure 3-28: Annual Hours of Delay per Peak Auto Commuter

Source: TTI 2010 Urban Mobility Report

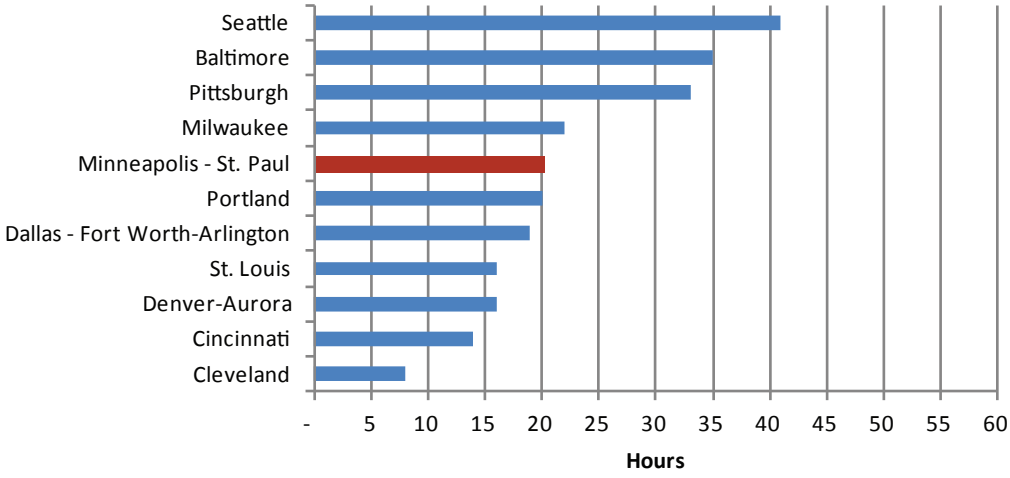


Figure 3-29: 1990 Annual Delay per Peak Commuter

Source: TTI 2010 Urban Mobility Report

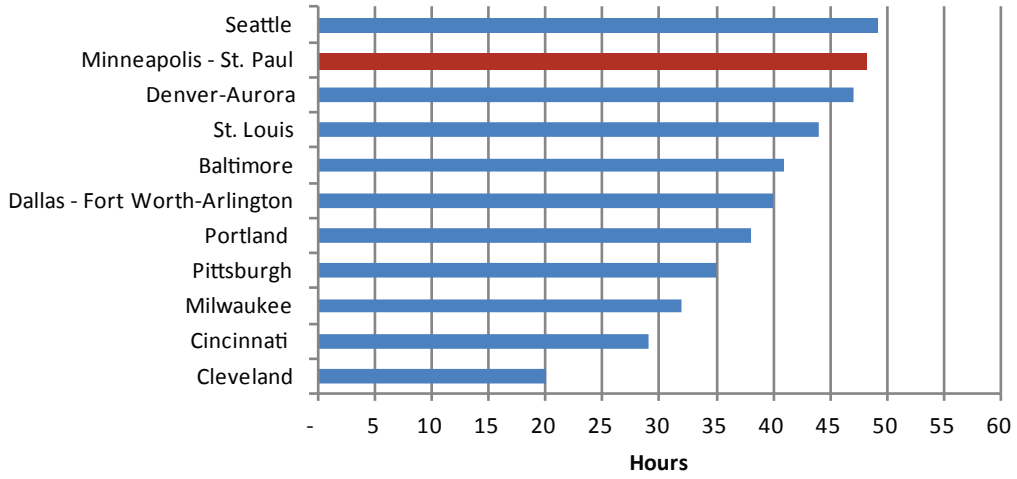


Figure 3-30: 2000 Annual Delay per Peak Commuter

Source: TTI 2010 Urban Mobility Report

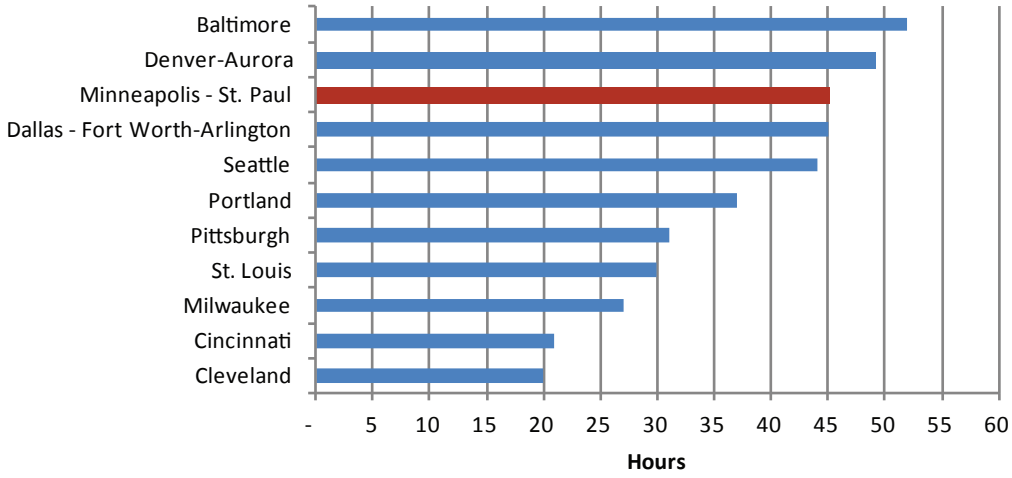


Figure 3-31: 2010 Annual Delay per Peak Commuter

Source: TTI 2010 Urban Mobility Report

Between 1990 and 2010, delay for peak auto travelers in the Twin Cities increased by 125%, whereas the peer city and large city averages increased by 64% and 55%, respectively. In other words, growth in the delay per traveler in the Twin Cities was nearly twice the average growth in delay for peer urban areas and well over twice the average growth of the large city average.

Twin Cities residents spent more time in delay than residents of peer urban areas or large cities (on average). Growth in delay per traveler was nearly double that of growth in delay per traveler for comparable cities. In 2010, the average Twin Cities traveler spent 45 hours delayed in traffic according to the TTI Urban Mobility Report.

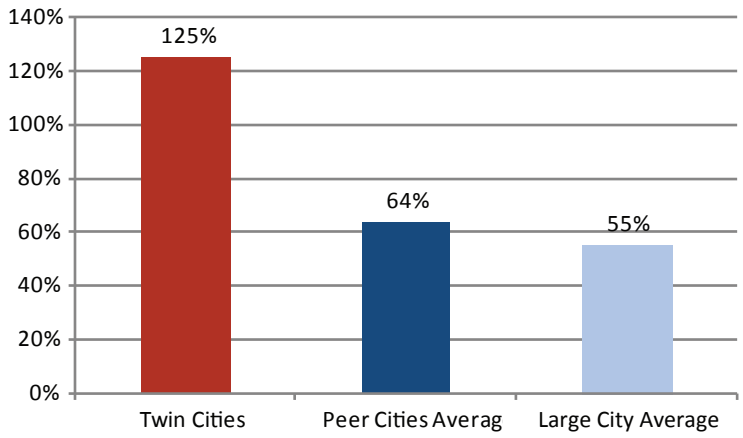


Figure 3-32: Change in Annual Delay per Peak Auto Traveler 1990 to 2010

Source: TTI 2010 Urban Mobility Report

Congestion Impact on Travel Time

Another measure of congestion is the time it takes to make trips in congested conditions versus the time it would take in free-flow conditions. The Travel Time Index is used to assess these impacts. The Travel Time Index measures the amount of additional time that a trip takes because of congestion. A Travel Time Index of 1.30 indicates that it takes 30% longer to make a trip in the peak period than in off peak conditions, when the motorist could travel at free-flow speeds.

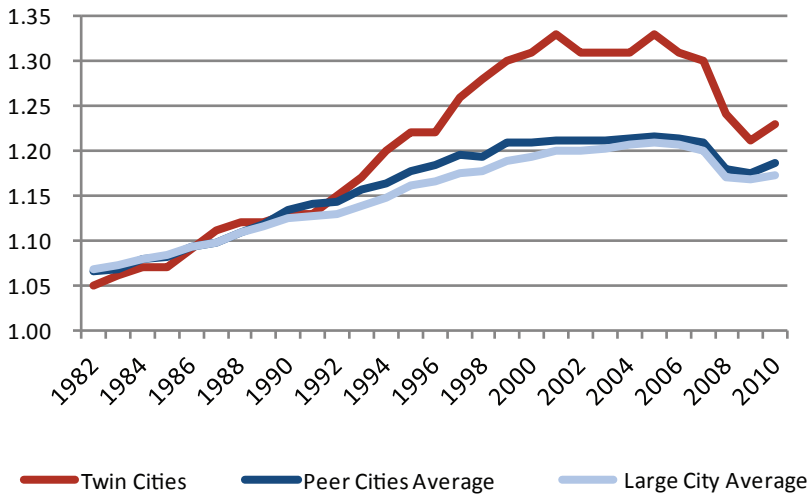


Figure 3-33: Travel Time Index Pattern

Source: TTI 2010 Urban Mobility Report

The Travel Time Index for the Twin Cities urban area was 1.23 in 2010, up from 1.13 in 1990. The average for the region's peer cities was 1.19 and 1.17 for large cities.

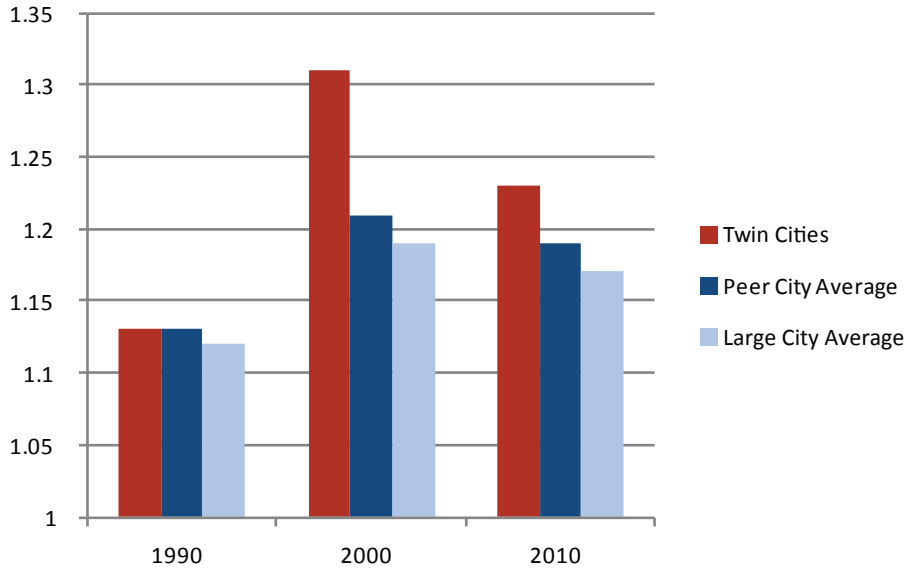


Figure 3-34: Travel Time Indices: 1990, 2000, and 2010

Source: TTI 2010 Urban Mobility Report

Trends

Many of the key indicators for highway travel show improvements in recent years (slowing in growth of VMT, decline in VMT per capita, miles of severe congestion, annual cost of congestion, annual hours of delay, Travel Time Index). However, the cause of these improvements is less clear. Major improvements to the highway system have occurred in the last decade, such as the completion of the new TH 212, the addition of a third land to portion of I-494 in the southwest area of the region, the removal of bottlenecks at the interchanges of I-694/I-35E and I-35W/TH 62, the Urban Partnership Agreement project on I-35W. While these improvements have provided significant benefits to those corridors, the region wide decline in travel as illustrated previously in Figure 3-12 "Change in AADT from 2005 to 2010" is likely due to the larger influence of the change in the economy.

The region grew significantly between 1970 and 2000. Between 2000 and 2010, the rate of growth in population and households was roughly half that of previous decades, and the region's employment showed an actual decline between 2000 and 2010.

Table 3-18: Growth Trends

Decade	Population	Households	Employment
1970 to 1980	6%	26%	34%
1980 to 1990	15%	21%	22%
1990 to 2000	15%	17%	26%
2000 to 2010	8%	9%	-4%

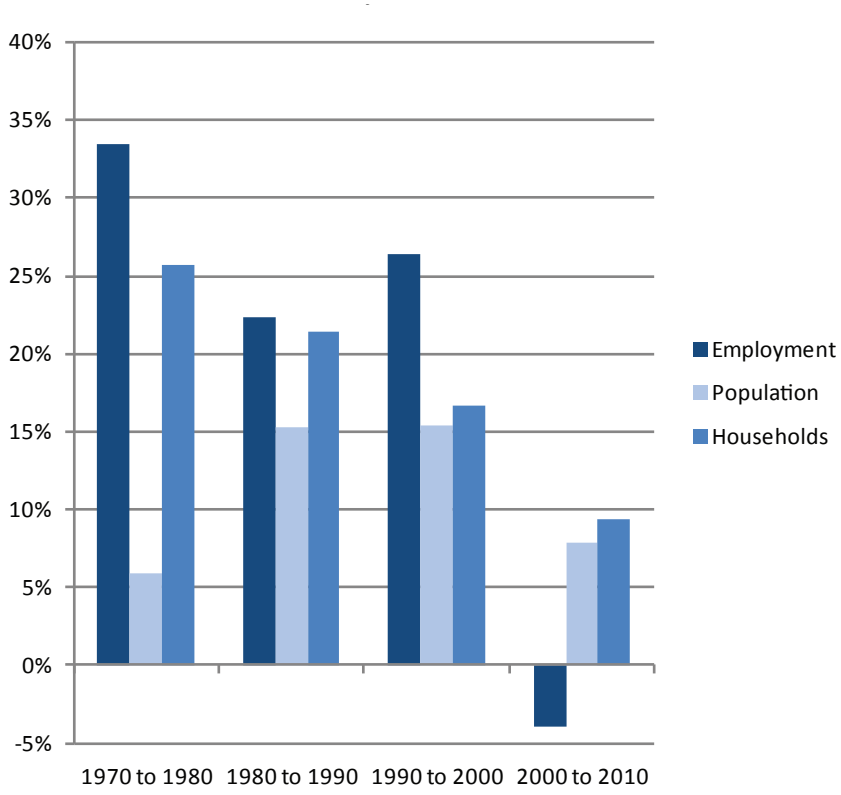


Figure 3-35: Change in Employment, Population, and Households by Decade

Exacerbating the situation was the jump in gas prices in the latter half of the current decade. At the beginning of 2005 the average retail price of a gallon of regular gasoline was around $1.60. By the middle of 2008 it had hit a high of just over $4 a gallon. It did drop precipitately to the 2005 levels in late 2008, but has generally climbed continuously since that time. In mid-2010, the price of a gallon of gas was around $2.50 and up to around $3.50 a year later in mid-2011. This increase in the cost of gas has influenced people's driving habits. The result: fewer auto trips, more trip combination (trip chaining), and shorter trips. While this behavior results in the observed reduction of use of the highway system and the impacts of that use, an improvement in the economy would likely reverse many of these trends. Also, as the cost of gasoline increases, the introduction of more fuel efficient vehicles into the general mix of autos (hybrids, alternative fuel vehicles, electric vehicles) will reduce the influence of high gas prices on travel behavior.

Chapter 4: Transit System

Characteristics of the Transit System

There are currently five modes of public transit service in the Twin Cities area: commuter rail service, light-rail transit service, regular-route bus service, dial-a-ride service, and vanpool service.

- Light-rail transit (LRT) service was added to the regional system in 2004.
- Commuter rail service was added to the region in late 2009.
- Regular-route service is provided on a fixed schedule along specific routes, with vehicles stopping to pick up and drop off passengers at designated locations.
- Dial-a-ride (DAR) service does not follow a fixed route. Passengers board and arrive at prearranged times and locations within the designated service area. Typically, each trip is scheduled separately.
- Vanpool service provides vehicles and financial incentives to groups, typically five to 15 people, sharing rides to a common destination or area not served by regular-route transit service.

Twin Cities Transit Providers

Metropolitan Council

Metro Transit

Metro Transit, an operating division of the Metropolitan Council, is the largest provider of regular-route transit service in the Minneapolis/St. Paul metropolitan area.

Metro Transit Bus: In December 2011, Metro Transit provided direct service on 119 routes – 66 local routes and 53 express routes.

Table 4-1: 2011 Operating Statistics: Metro Transit Bus

2011 NTD Statistics	Operating Cost	Fare Revenue	Ridership	Revenue Hours	Subsidy Per Pass[4]	Pass. Per Rev. Hour
Urban Local Bus	$191,156,000	$51,458,500	58,769,500	1,623,000	$2.38	36.2
Suburban Local Bus	$7,038,000	$1,452,400	1,631,700	59,500	$3.42	27.4
Express Bus	$37,352,000	$17,651,400	7,992,900	243,200	$2.46	32.9
Other[1]	$4,306,000	$2,679,800	629,600	16,300	-	-
In Contracted Fares[2]	-	$1,951,700	-	-	-	-
In Maple Grove[3]	$3,172,000	$1,916,400	758,900	17,900	-	-
Metro Transit Bus Total	$239,852,000	$73,242,100	69,023,700	1,942,000	$2.41	35.5

1. "Other" includes special event service operated for the Minnesota State Fair and other special events.
2. Non-cash fare revenue for MTS contracted regular routes reported to the National Transit Database (NTD) by Metro Transit.
3. Figures were reported to NTD by Metro Transit but are credited to the agencies that own the actual service. These figures are excluded from Metro Transit's totals.
4. Pass = Passenger

Metro Transit Light Rail: Metro Transit began operating the region's first light rail service, the 12-mile Hiawatha Line (subsequently renamed the METRO Blue Line), in 2004. The line currently serves 19 stations. Improvements to expand stations to allow service from 3-car train sets, which allow for additional capacity during high-demand periods, were completed in 2010. Metro Transit is also working on construction of the METRO Green Line, projected to being operations in 2014.

Table 4-2: 2011 Operating Statistics: Metro Transit Light Rail

2011 NTD Statistics	Operating Cost	Fare Revenue	Ridership	Revenue Hours	Subsidy Per Pass.	Pass. Per Rev. Hour
Metro Transit Light Rail Total	$25,716,000	$10,138,600	10,400,900	67,700	$1.50	153.6

Metro Transit Commuter Rail: Metro Transit began operating the region's first commuter rail service, the 40-mile Northstar line, in late 2009. There were six stations in operation as part of the initial project build with an additional station recently completed in November 2012 in the city of Ramsey. The line operates with six locomotives and 18 passenger cars that are maintained at a service facility in Big Lake.

Table 4-3: 2011 Operating Statistics: Metro Transit Commuter Rail

2011 NTD Statistics	Operating Cost	Fare Revenue	Ridership	Revenue Hours	Subsidy Per Pass.	Pass. Per Rev. Hour
Metro Transit Commuter Rail Total	$15,474,000	$2,670,800	703,400	3,900	$18.20	180.4

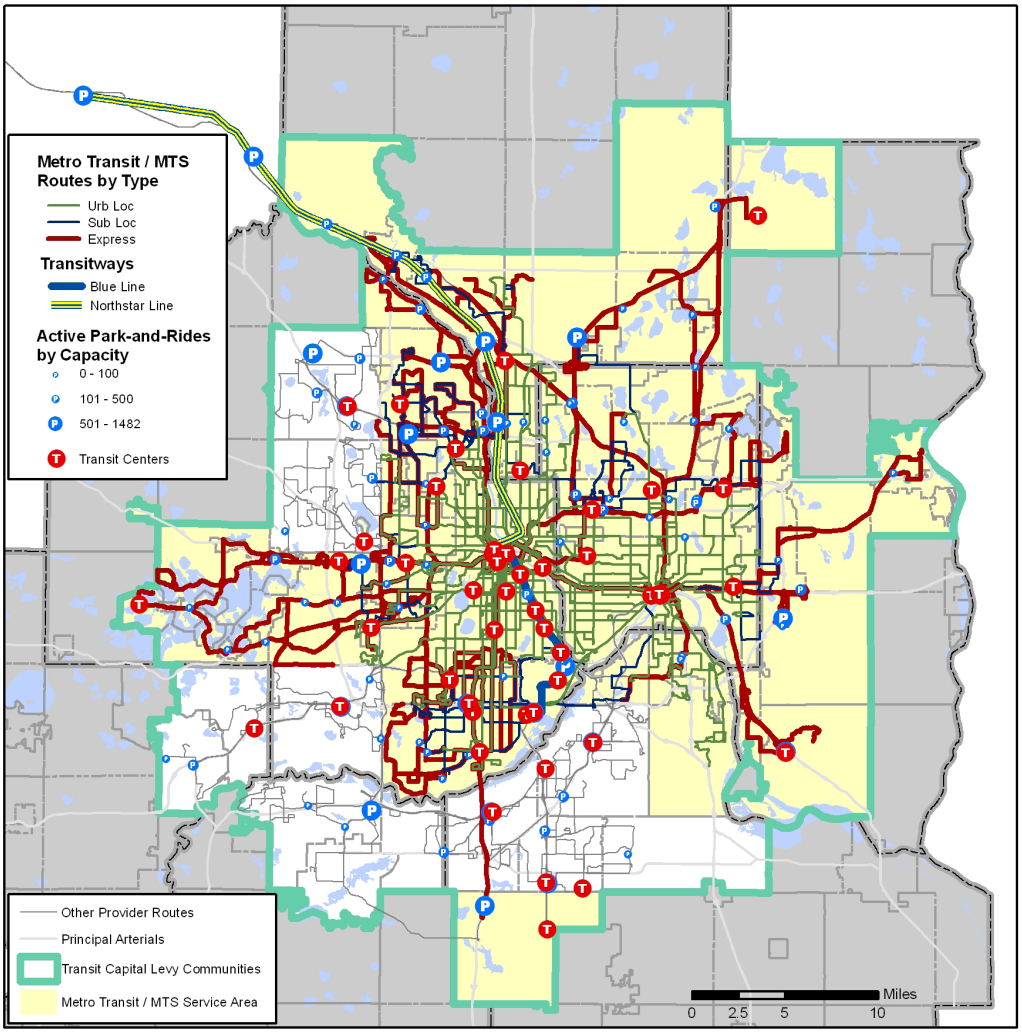


Figure 4-1: Metro Transit and Met Council Regular Route Service

Metropolitan Transportation Services (MTS)

MTS Contracted Regular-Route Service: Metropolitan Council provides bus service on 33 routes through 10 contracts with private transportation companies. Some of the larger contracted services include the Bloomington-Edina routes, Anoka County routes, and the Brooklyn Circuit.

Table 4-4: 2011 Operating Statistics: MTS Contracted Regular Routes

2011 NTD Statistics	Operating Cost	Fare Revenue	Ridership	Revenue Hours	Subsidy Per Pass.	Pass. Per Rev. Hour
Urban Local Bus	$3,056,000	$690,200	671,700	36,100	$3.52	18.6
Suburban Local Bus	$8,180,000	$1,755,300	1,947,100	132,000	$3.30	14.8
Express Bus	$1,685,000	$716,300	309,500	12,300	$3.13	25.2
Met Council Bus Total	**$12,921,000**	**$3,161,800**	**2,928,300**	**180,400**	**$3.33**	**16.2**

Metro Mobility: This service is provided as required by the Americans with Disabilities Act (ADA) to persons whose disabilities prevent them from using the regular-route transit system. These services are provided through contracts with two private companies, two private nonprofit entities, and two local government units. Service is also provided to areas required through Minnesota Statute 473.386 to the non-ADA areas within the Metro Mobility service area (see map).

Table 4-5: 2011 Operating Statistics: Metro Mobility

2011 NTD Statistics	Operating Cost	Fare Revenue	Ridership	Revenue Hours	Subsidy Per Pass.	Pass. Per Rev. Hour
Metro Mobility Total[1]	$41,297,000	$5,407,900	1,579,700	759,900	$22.72	2.1

1. Metro Mobility statistics reflect all costs and statistics provided with funding through Metro Mobility, including those provided under contract to other dial-a-ride programs.

Transit Link: MTS implemented a significant restructuring of its general public dial-a-ride programs during 2010. Transit Link, a region-wide contracted service, was implemented early in the year after significant stakeholder input. As part of the reorganization, MTS phased out annual subsidies to locally controlled community-based dial-a-ride programs and replaced it with the coordinated and uniform program available region-wide. The new Transit Link program provides rides in parts of the region not served by—and integrates fully with—regular route transit.

Table 4-6: 2011 Operating Statistics: Transit Link Dial-a-Ride

2011 NTD Statistics	Operating Cost	Fare Revenue	Ridership	Revenue Hours	Subsidy Per Pass.	Pass. Per Rev. Hour
Transit Link Total	$6,984,000	$768,200	329,900	117,000	$18.84	2.8

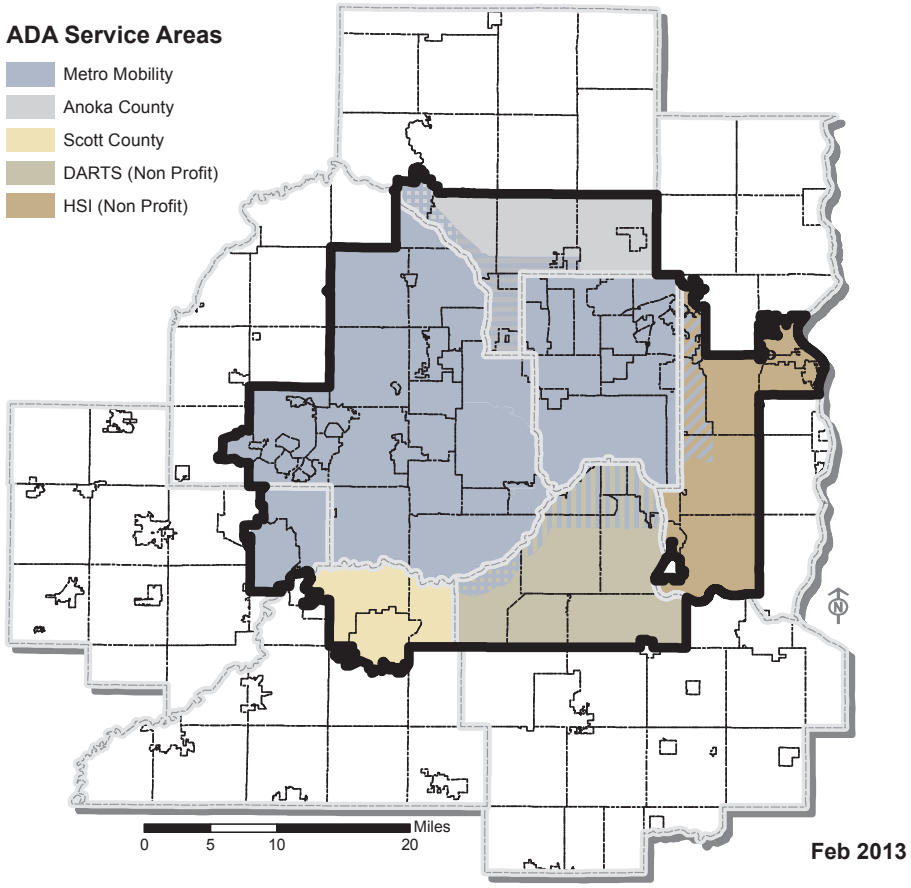


Figure 4-2: ADA Service Areas

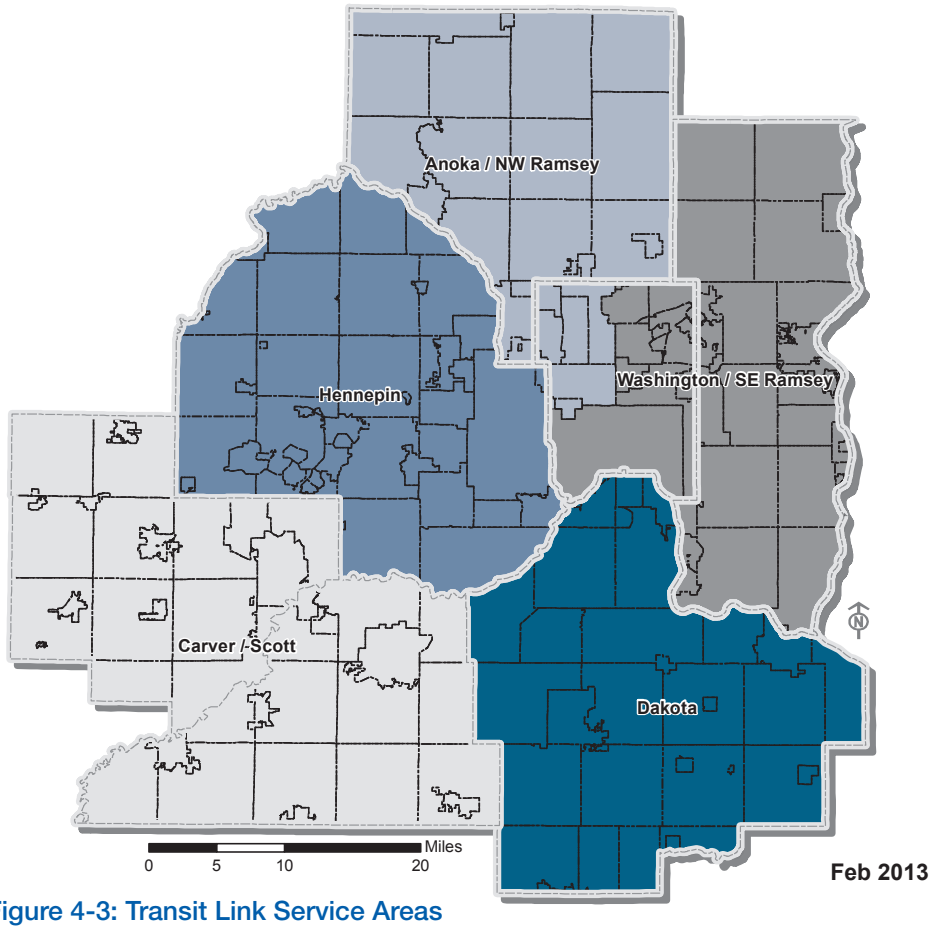


Figure 4-3: Transit Link Service Areas

VanGo!: The Metropolitan Council subsidizes a commuter vanpool program called Van-GO! This program started in 2001 as a way of providing transit service for people living or working in areas not served by regular route service. People driving long distances from low-density areas add a disproportionate number of vehicle miles traveled (VMT). Removing or reducing these trips on the road network leads to significant benefits in term of traffic congestion, air pollution, and greenhouse gas emissions.

Table 4-7: 2011 Operating Statistics: Vanpools

2011 NTD Statistics	Operating Cost	Fare Revenue	Ridership	Revenue Hours	Subsidy Per Pass.	Pass. Per Rev. Hour
Vanpool Total	$1,481,000	$774,000	189,800	26,500	$3.72	7.2

Suburban Transit Providers

Prior to 1982, the Metropolitan Transit Commission (the predecessor to Metro Transit) levied a property tax throughout the region to provide funding for transit operations. In 1982, certain communities were allowed to retain up to 90% of the property tax levied in their communities to "opt out" of Metro Transit's service and to provide transit service themselves rather than fund the regional system. Twelve communities have chosen to provide their own transit service through special state legislation.

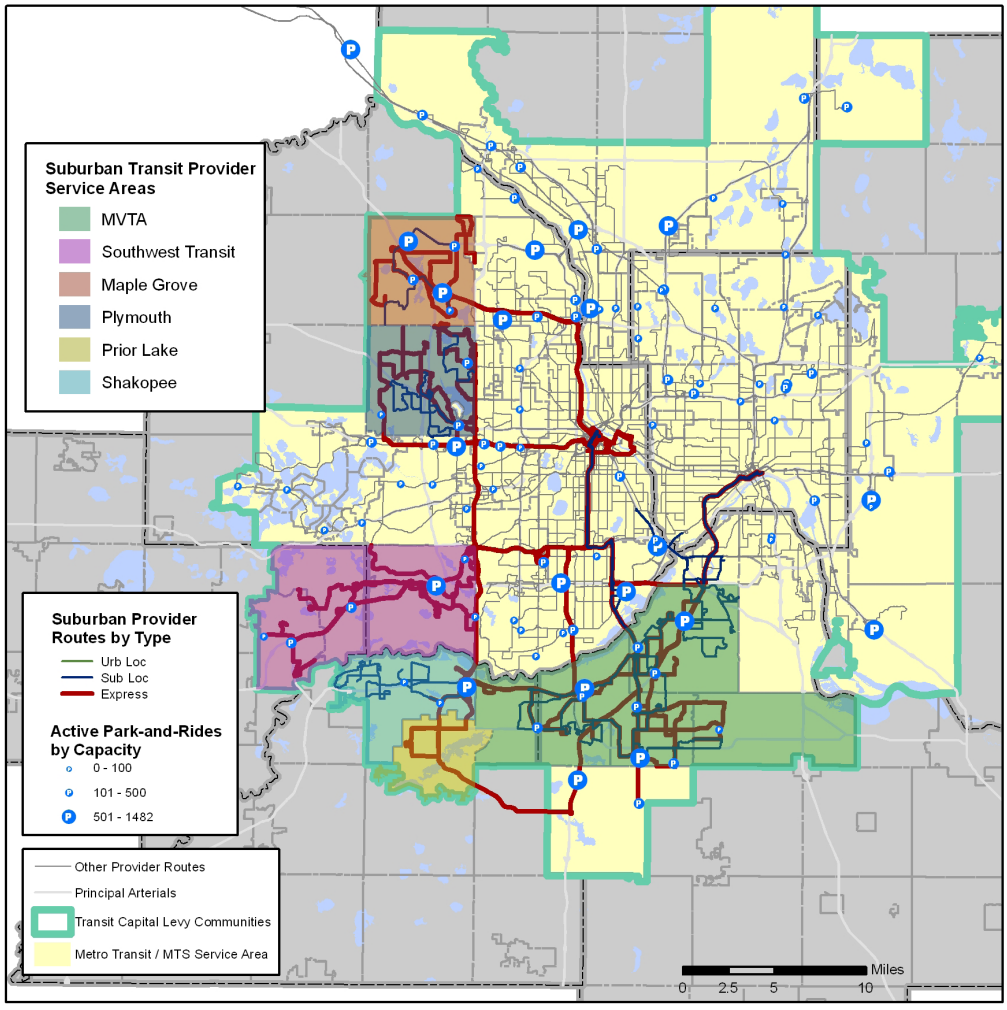


Figure 4-4: Suburban service areas with routes by route type highlighted

Minnesota Valley Transit Authority (MVTA)

The MVTA was established as a Joint Powers Board in 1990 and serves the residents and businesses of Apple Valley, Burnsville, Eagan, Rosemount, and Savage. At the end of 2011, the MVTA operated a total of 25 routes: three flex-routes and/or shuttles operating in the suburban area, 10 express routes into downtown Minneapolis, two express routes into downtown St. Paul, seven local routes, and three peak-period reverse-commute services. MVTA operates services to 11 park-and-ride facilities out of two bus garages.

Table 4-8: 2011 Operating Statistics: MVTA

2011 NTD Statistics	Operating Cost	Fare Revenue	Ridership	Revenue Hours	Subsidy Per Pass.	Pass. Per Rev. Hour
Suburban Local Bus	$6,948,000	$703,500	778,200	67,200	$8.02	11.6
Express Bus	$10,285,000	$4,316,700	1,757,100	53,900	$3.40	32.6
Other	$137,000	$132,3006	52,900	1,200	-	-
MVTA Total	**$17,370,000**	**$5,152,500**	**2,588,200**	**122,300**	**$4.72**	**21.2**

SouthWest Transit (SWT)

The Southwest Transit Commission was formed in July 1986 by a Joint Powers Agreement between the cities of Eden Prairie, Chanhassen, and Chaska. Their bus service is primarily oriented toward service downtown Minneapolis and the University of Minnesota. At the end of 2011, SWT operated eight express routes and two suburban local routes. SWT operates service to 8 park-and-ride facilities.

Table 4-9: 2011 Operating Statistics: SouthWest Transit

2011 NTD Statistics	Operating Cost	Fare Revenue	Ridership	Revenue Hours	Subsidy Per Pass.	Pass. Per Rev. Hour
Suburban Local Bus	$268,000	$18,100	16,600	2,500	$15.05	6.6
Express Bus	$6,955,000	$2,262,300	934,900	32,900	$5.02	28.4
Other	$268,000	$176,100	78,500	1,200	-	-
SouthWest Transit Total	**$7,491,0007**	**$2,456,500**	**1,030,000**	**36,600**	**$4.89**	**28.1**

Maple Grove Transit

Maple Grove Transit was formed in June 1990 to serve the City of Maple Grove. Maple Grove Transit operates a fleet of 41 buses offering commuter express service to and from Minneapolis utilizing 45 round trips on six routes. Maple Grove also offers a local dial-a-ride service operating weekdays from 6:00 a.m. to 6:00 p.m. and 8:00 a.m. to 4:30 pm on Saturdays.

Table 4-10: 2011 Operating Statistics: Maple Grove

2011 NTD Statistics	Operating Cost	Fare Revenue	Ridership	Revenue Hours	Subsidy Per Pass.	Pass. Per Rev. Hour
Dial-a-Ride	$508,000	$42,100	30,800	11,300	$15.13	2.7
Suburban Local Bus	$58,000	$15,500	11,900	900	$3.57	13.2
Express Bus	$3,563,000	$1,900,900	758,700	17,000	$2.19	44.6
Maple Grove Total	**$4,129,000**	**$1,958,500**	**801,400**	**29,200**	**$2.71**	**27.4**

Plymouth Metrolink

Established in 1984, Plymouth Metrolink was formed under the replacement transit service demonstration legislation. Plymouth Metrolink has seven express routes to Minneapolis, two reverse commute routes from Minneapolis, and four local shuttle routes that connect the express routes. The city also operates a dial-a-ride service.

Table 4-11: 2011 Operating Statistics: Plymouth

2011 NTD Statistics	Operating Cost	Fare Revenue	Ridership	Revenue Hours	Subsidy Per Pass.	Pass. Per Rev. Hour
Dial-a-Ride	$784,000	$95,500	37,500	12,800	$18.36	2.9
Suburban Local Bus	$504,000	$64,900	57,600	4,200	$7.62	13.4
Express Bus	$2,583,000	$891,200	420,400	17,300	$4.02	24.4
Plymouth Total	**$3,871,000**	**$1,051,600**	**515,500**	**34,300**	**$5.47**	**15.0**

Prior Lake Transit

Prior Lake was serviced by MVTA until 2002 when the city chose to create its own transit service. The city operates Laker Lines, an express service from Prior Lake to downtown Minneapolis, and Local Laker Link, a summer circulator service within the city boundaries. In July 2007, the city partnered with the City of Shakopee and Scott County to begin operation of BlueXpress.

Shakopee Area Transit

In 1984 and 1985, the city of Shakopee established itself as a local transit provider under the name Shakopee Area Transit. In July 2007, the cities of Shakopee and Prior Lake and Scott County opened the 500-space Southbridge Crossings Transit Station and launched the BlueXpress commuter express service (Route 490) to downtown Minneapolis. In addition, the city operates two circulator routes within the city, a shuttle to the BlueXpress service, and a summer shuttle.

Table 4-12: 2011 Operating Statistics: BlueXpress

2011 NTD Statistics	Operating Cost	Fare Revenue	Ridership	Revenue Hours	Subsidy Per Pass.	Pass. Per Rev. Hour
BlueXpress Total	$1,702,000	$452,100	171,600	6,800	$7.28	25.2

Table 4-13: 2011 Operating Statistics: Suburban Local

2011 NTD Statistics	Operating Cost	Fare Revenue	Ridership	Revenue Hours	Subsidy Per Pass.	Pass. Per Rev. Hour
Shakopee Suburban Local Total	$446,000	$32,900	32,200	6,000	$12.83	5.4

Other Providers

The Ramsey Star Express

Route 856 served the city of Ramsey and downtown Minneapolis. This route began operations in 2007 and 2008 was the first full year of operations. This route was eliminated in November 2012 after the opening of the Ramsey Station on the Northstar Commuter Rail line.

Rush Line Express

The Route 285 Rush Line Express demonstration route began operating in October 2010. The service is comprised of four morning and four evening

trips originating at the Columbus park-and-ride traveling to the Forest Lake Transit Center then into St. Paul (two trips also stop at the White Bear Theatre park-and-ride). Until December 2012, the service was operated by First Transit using leased commuter-type coaches. The Rush Line Task Force contracted with Metropolitan Council to administer the contract and provide customer service, fare equipment leasing, and street supervision in downtown St. Paul. The Rush Line Task Force provided initial funding for this demonstration service. In December 2012, Metro Transit assumed operation of Route 285 and will incorporate the service between downtown St. Paul and White Bear Lake into its system.

Table 4-14: 2011 Operating Statistics: Other Transit Service

2011 NTD Statistics	Operating Cost	Fare Revenue	Rider-ship	Revenue Hours	Subsidy Per Pass.	Pass. Per Rev. Hour
Rush Line Express Service to St. Paul	$406,000	$79,000	32,400	2,200	$10.09	14.7
Ramsey Star Express Service	$378,000	$137,100	54,100	1,300	$4.45	41.6

University of Minnesota Parking and Transportation Services

The University contracts with a private provider to operate and maintain a system of buses on four primary routes on the Minneapolis and St. Paul campuses. Free service is provided on three shuttle routes and the high-frequency campus connector. Additionally, the department also provides a free specialized curb-to-curb on-campus transportation service to persons with either temporary or permanent physical disabilities.

Table 4-15: 2011 Operating Statistics: University of Minnesota

2011 NTD Statistics	Operating Cost	Fare Revenue	Ridership	Revenue Hours	Subsidy Per Pass.	Pass. Per Rev. Hour
Urban Local Bus	$5,220,000	-	3,528,700	43,000	$1.48	82.1
Dial-a-Ride	$155,000	-	5,200	2,900	$29.81	1.8
University of MN Total	**$5,375,000**	**-**	**3,533,900**	**45,900**	**$1.52**	**77.0**

Summary of Transit System Statistics

Metro Transit carries 85% of the riders in the region. Light rail, despite only one line being open, carries about one out of every nine regional transit trips.

Metro Transit provides the largest number of transit service hours of any provider in the region. Metro Mobility, despite being only 1.7% of the regional ridership, accounts for 22.5% of the regional service hours.

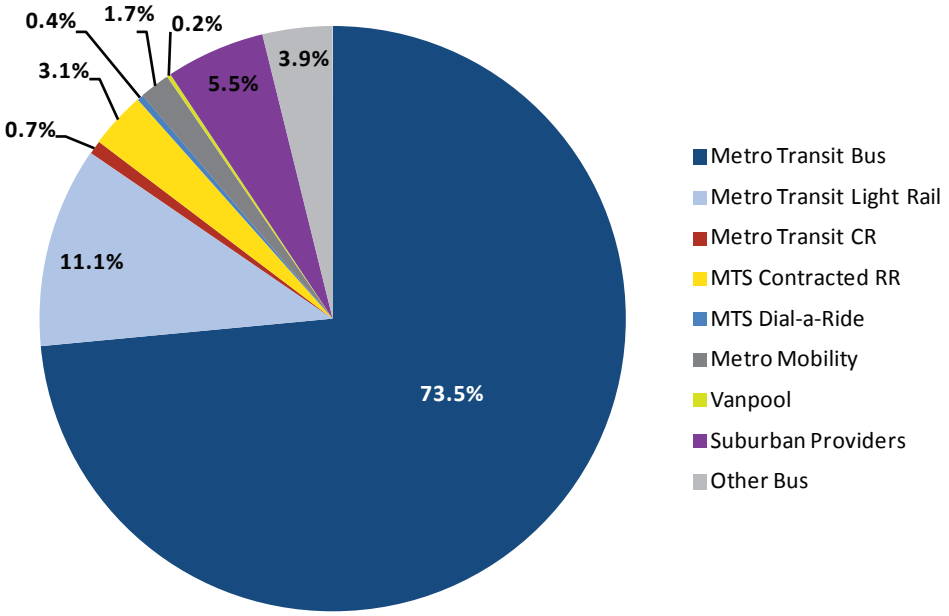


Figure 4-5: 2011 Ridership by Provider

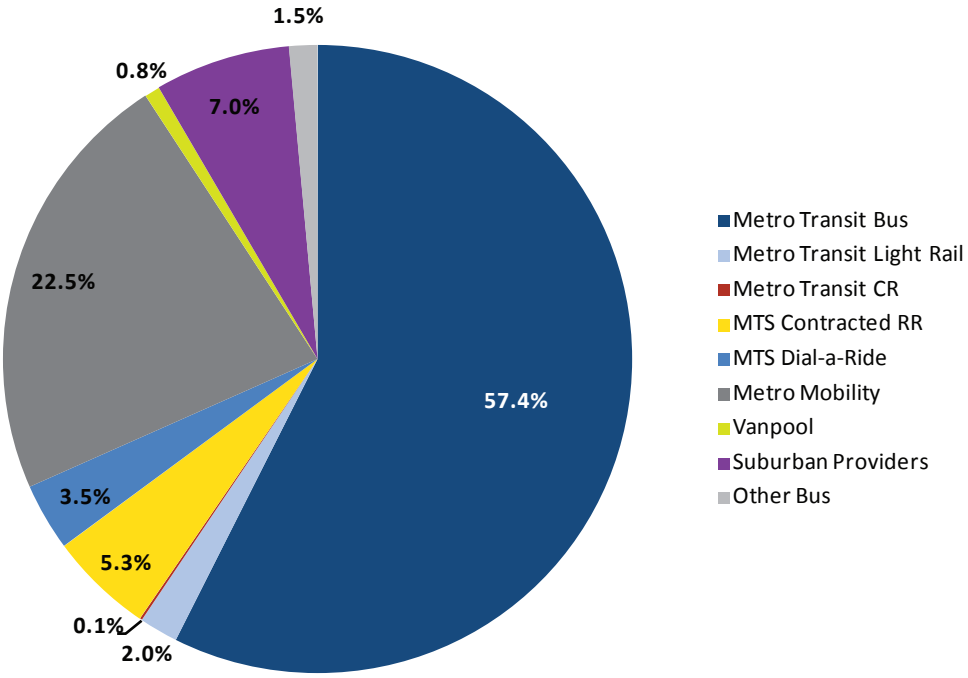


Figure 4-6: 2011 Revenue Hours by Provider

Table 4-16: 2011 Regional Transit Operating Statistics, by Provider

System (2011 NTD statistics)	Operating Cost	Fare Revenue	Passen-gers	Revenue Hours	Subsidy Per Pas-senger	Pass. Per Rev. Hour
Metropolitan Council – Directly Operated[1]						
Metro Transit Bus	$239,852,000	$73,242,100	69,023,700	1,942,000	$2.38	35.5
Metro Transit LRT	$25,716,000	$10,138,600	10,400,900	67,700	$1.50	153.6
Metro Transit CR	$15,474,000	$2,670,800	703,400	3,900	$18.20	180.4
Metro Transit Subtotal	$281,042,000	$86,051,500	80,128,000	2,013,600	$2.43	39.8
Metropolitan Council – MTS Contracted						
Metro Mobility	$41,297,000	$5,407,900	1,579,700	759,900	$22.72	2.1
Contracted RR	$12,921,000	$3,161,800	2,928,300	180,400	$3.33	16.2
Dial-a-Ride	$6,984,000	$768,200	329,900	117,000	$18.84	2.8
Vanpool	$1,481,000	$774,000	189,800	26,500	$3.72	7.2
MTS Subtotal	$62,683,000	$10,111,900	5,027,700	1,083,800	$10.46	4.6
Non-Metropolitan Council Providers						
Suburban Providers	$35,009,000	$11,104,100	5,138,900	235,200	$4.65	21.8
Rush Line to St. Paul	$406,000	$79,000	32,400	2,200	$10.09	14.7
Ramsey Star	$378,000	$137,100	54,100	1,300	$4.45	41.6
University of Minn.	$5,375,000	$0	3,533,900	45,900	$1.52	77.0
Non-Council Subtotal	$41,168,000	$11,320,200	8,759,300	284,600	$3.41	30.8
Regional Total	**$384,893,000**	**$107,483,600**	**93,915,000**	**3,382,000**	**$2.95**	**27.8**

1. Metro Transit also carries certain regional costs for the transit system, such as the cost of selling fare media, distribution of schedules, and other regionwide costs.

Table 4-17: 2011 Regional Transit Operating Statistics, by Mode/Type

System (2011 statistics)	Operating Cost	Fare Revenue	Passengers	Revenue Hours	Subsidy/ Passenger	Cost / Rev. Hour	Fare Recov.	Pass. Per Rev. Hr.
Urban Local	$199,432,000	$52,148,700	62,969,900	1,702,100	$2.34	$117.17	26.1%	37.0
Suburban Local	$23,442,000	$4,042,600	4,475,300	272,400	$4.33	$86.06	17.2%	16.4
Express	$64,909,000	$28,407,000	12,431,600	386,800	$2.94	$167.81	43.8%	32.1
Bus Subtotal	$287,783,000	$84,598,300	79,876,800	2,361,300	$2.54	$121.87	29.4%	33.8
Light Rail	$25,716,000	$10,138,600	10,400,900	67,700	$1.50	$379.85	39.4%	153.6
Commuter Rail	$15,474,000	$2,670,800	703,400	3,900	$18.20	$3,968	17.3%	180.4
Dial-a-Ride	$49,728,000	$6,313,700	1,983,100	903,900	$21.89	$55.01	12.7%	2.2
Vanpool	$1,481,000	$774,000	189,800	26,500	$3.72	$55.89	52.3%	7.2
Other	$4,711,000	$2,988,200	761,000	18,700	-	-	-	-
Regional Total	**$384,893,000**	**$107,483,600**	**93,915,000**	**3,382,000**	**$2.95**	**$113.81**	**27.9%**	**27.8**

Ridership

Regional transit ridership was consistently growing until 2009, when the economic recession resulted in job losses and lowered transit demand. In 2010 and 2011, transit ridership returned to the trend of consistent growth at 2.4% and 3.1%, respectively. The growth is slower than in previous years as the country and region continue to recover from the economic recession.

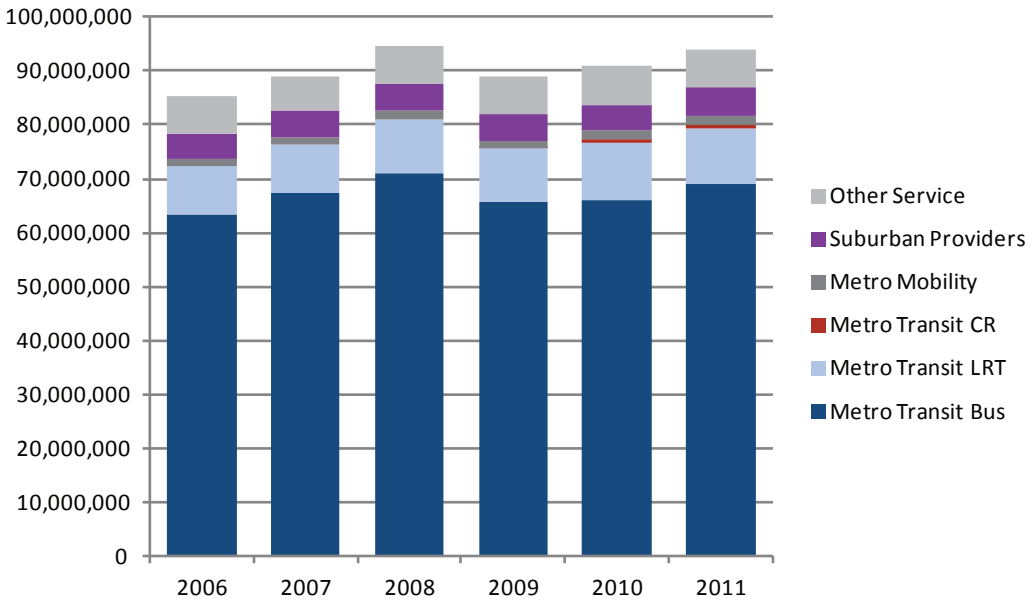


Figure 4-7: Transit Ridership by Program Type

Table 4-18: Regional Transit Ridership, 2006-2011

	2006	2007	2008	2009	2010	2011
Metro Transit Bus[1]	63,517,300	67,270,100	70,852,400	65,689,000	66,169,600	69,023,700
Metro Transit Light Rail	8,957,900	9,101,000	10,221,700	9,863,000	10,455,900	10,400,900
Metro Transit Commuter Rail	-	-	-	78,800	710,400	703,400
Suburban Transit Providers	4,583,700	4,786,300	5,286,500	4,772,900	4,821,100	5,138,900
MTS Contracted Regular Route	2,439,500	2,293,800	2,539,300	2,429,400	2,774,600	2,928,300
MTS Dial-a-Ride	495,600	491,000	454,000	390,100	334,700	329,900
Metro Mobility / ADA	1,287,100	1,363,700	1,430,200	1,445,000	1,512,400	1,579,700
Vanpool	157,500	176,300	209,800	193,500	182,500	189,800
Subtotal	81,438,600	85,482,200	90,993,900	85,861,400	86,961,200	90,294,600
Other	181,900	188,000	224,700	196,000	59,900	86,500
University of Minnesota	3,687,600	3,273,100	3,551,100	3,873,200	4,044,200	3,533,900
Regional Total	**85,308,100**	**88,943,300**	**94,769,700**	**88,930,900**	**91,065,300**	**93,915,000**

1. Metro Transit provides service under contract to some Suburban Transit Providers. These statistics are reported only under Suburban Transit Provider statistics in this section.

Revenue Hours and Revenue Miles

In the past six years, there are not been significant changes to regional transit service levels, as measured by miles and hours of service.

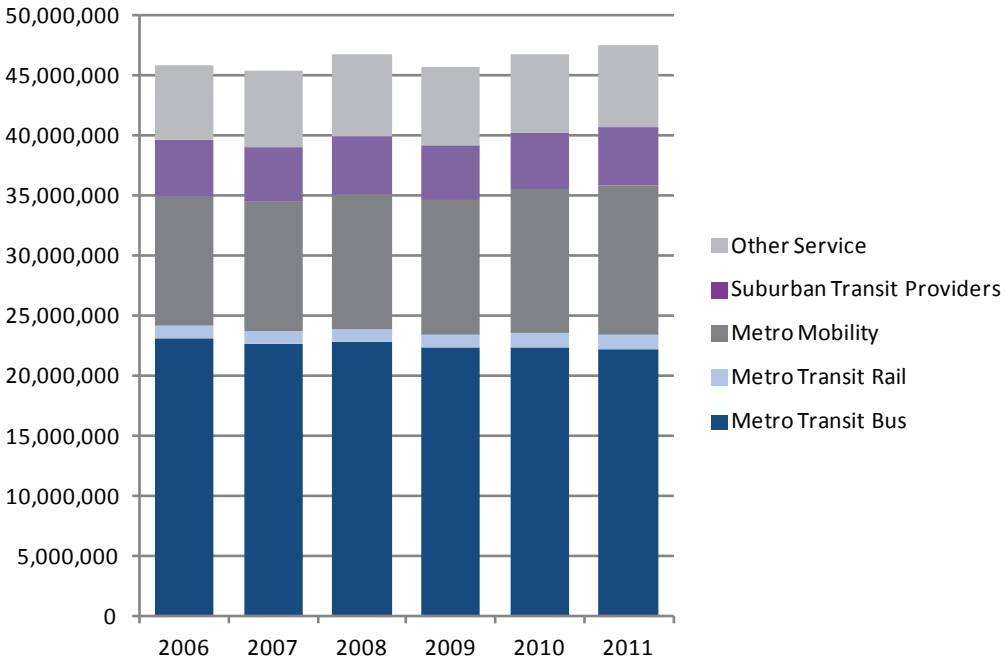


Figure 4-8: Transit Revenue Miles by Program Type

Table 4-19: Regional Transit Revenue Miles, 2006-2011

	2006	2007	2008	2009	2010	2011
Metro Transit Bus[1]	23,167,000	22,745,000	22,864,000	22,386,000	22,396,000	22,245,000
Metro Transit Light Rail	1,033,000	1,018,000	1,046,000	1,027,000	1,043,000	994,000
Metro Transit Commuter Rail	-	-	-	18,000	146,000	146,000
Suburban Transit Providers	4,641,000	4,696,000	4,891,000	4,623,000	4,706,000	4,858,000
MTS Contracted Regular Route	2,348,000	2,252,000	2,636,000	2,714,000	2,694,000	2,692,000
MTS Dial-a-Ride	2,241,000	2,207,000	2,206,000	1,854,000	1,962,000	2,144,000
Metro Mobility / ADA	10,778,000	10,671,000	11,171,000	11,203,000	12,020,000	12,542,000
Vanpool	1,004,000	1,125,000	1,248,000	1,222,000	1,219,000	1,231,000
Subtotal	45,212,000	44,714,000	46,062,000	45,047,000	46,186,000	46,852,000
Other	136,000	184,000	190,000	173,000	65,000	115,000
University of Minnesota	461,000	498,000	518,000	520,000	532,000	529,000
Regional Total	**45,809,000**	**45,396,000**	**46,770,000**	**45,740,000**	**46,783,000**	**47,496,000**

1. Metro Transit provides service under contract to some Suburban Transit Providers. These statistics are reported only under Suburban Transit Provider statistics in this section.

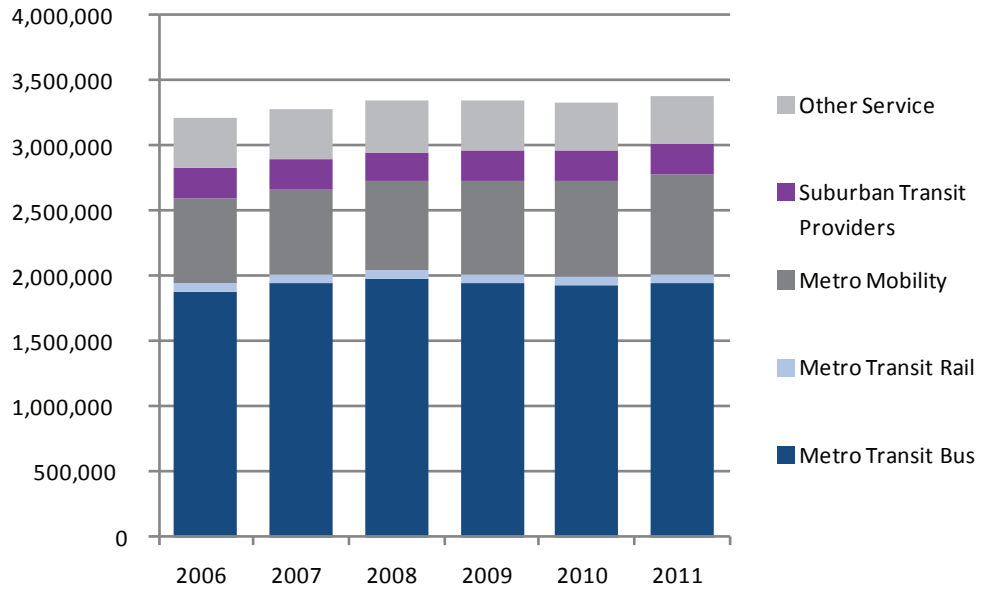


Figure 4-9: Transit Revenue Hours by Program Type

Table 4-20: Regional Transit Revenue Hours, 2006-2011

	2006	2007	2008	2009	2010	2011
Metro Transit Bus[1]	1,885,000	1,939,700	1,970,900	1,946,700	1,926,900	1,942,000
Metro Transit Light Rail	67,300	66,900	69,500	68,700	69,700	67,700
Metro Transit Commuter Rail	-	-	-	400	4,000	3,900
Suburban Transit Providers	235,400	225,400	230,200	230,500	229,500	235,200
MTS Contracted Regular Route	161,800	156,500	174,500	178,900	180,600	180,400
MTS Dial-a-Ride	158,000	155,100	150,600	124,800	115,500	117,000
Metro Mobility / ADA	644,100	663,100	682,900	712,600	730,200	759,900
Vanpool	23,800	27,300	29,700	28,800	26,800	26,500
Subtotal	3,175,400	3,234,000	3,308,300	3,291,400	3,282,200	3,332,600
Other	3,500	4,700	4,900	4,500	1,800	3,500
University of Minnesota	37,000	35,800	38,400	43,100	44,300	45,900
Regional Total	**3,215,900**	**3,274,500**	**3,351,600**	**3,339,000**	**3,329,300**	**3,382,000**

1. Metro Transit provides service under contract to some Suburban Transit Providers. These statistics are reported only under Suburban Transit Provider statistics in this section.

Transit Performance Measures

Operating subsidy per passenger measures the net government cost of providing transit service per trip, after accounting for fare revenue. In 2011, the regional average was $2.95, up from $2.60 in 2008 but down from $3.00 in 2010. Subsidy per passenger varies by type of service. Light rail is the most cost-effective service in the region.

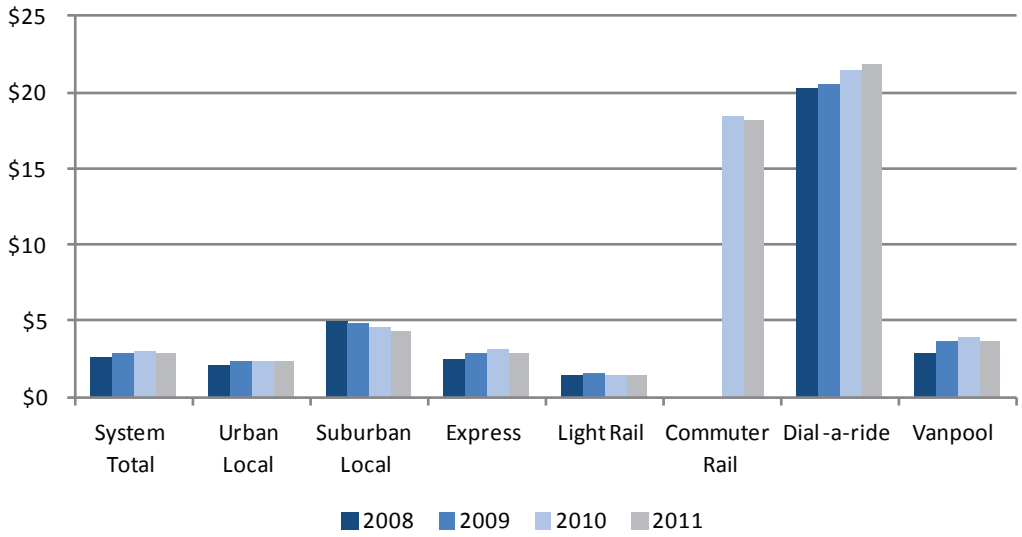


Figure 4-10: Subsidy per Passenger

Passengers per hour of transit service measures the efficiency of how many people are using a service relative to the amount of service available, measured in hours. The regional system performed at about 27.8 passengers per hour in 2011 and this figure is about the same as it was in 2008. Again, different service types have different performance outcomes. Light rail and commuter rail are the most productive services in the region, on a per hour basis. This can mostly be attributed to their higher capacity vehicles and the demand in the corridors.

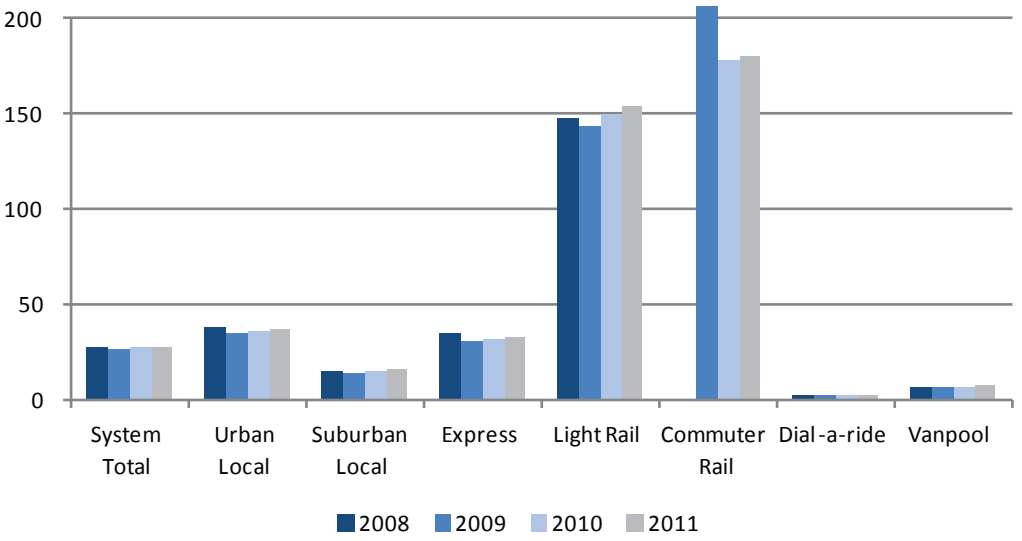


Figure 4-11: Passengers per Hour

Passengers per mile of transit service measures the efficiency of how many people are using a service relative to the amount of service available, measured in miles. The regional system performed at about 1.98 passengers per mile in 2011, down from 2.03 in 2008. Light rail is the most productive service in the region, carrying more than twice as many passengers per mile as the next closest service, commuter rail. Performance of the light rail has increased with the expansion of the system to accommodate three-car train sets.

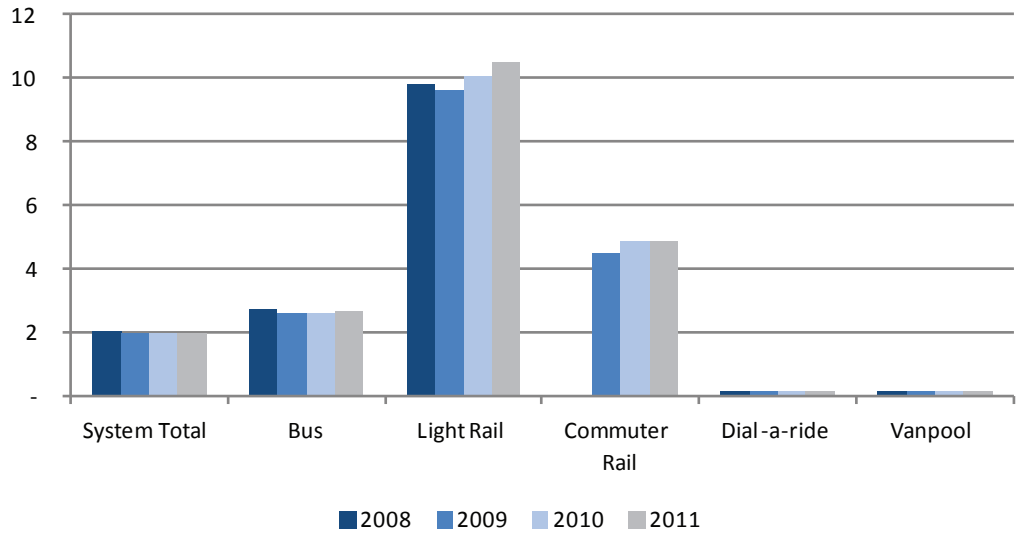


Figure 4-12: Passenger per Mile

Fare recovery is the percent of operating costs recovered through fare revenues from passengers. The regional percent was 27.9% in 2011, down from 28.7% in 2008. Vanpool collects a significant portion of costs from users but the program is not part of the regional fare structure and user costs include more than just fares. The express bus system collects the highest percent of costs from users within the regional fare structure.

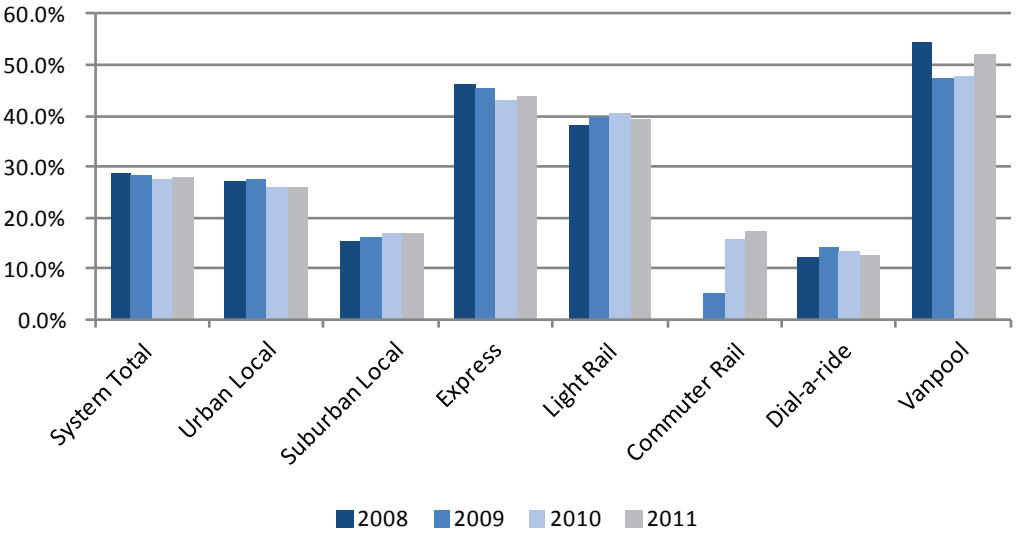


Figure 4-13: Fare Recovery

Transit Capital Resources

Peak Vehicles Operated

The core of any transit system is its vehicles. In 2011, the maximum number of vehicles used on any given day in the Twin Cities was 1,617. Less than half of these vehicles were used by Metro Transit bus and rail, with the remaining vehicles used by the other programs and providers in the region. The majority of these vehicles are buses, large and small, but there are a small number of vans as well. The relative number of transit trips taken by rail (11.8%) is in stark contrast to the number of vehicles operated as part of the regional system (2.9%).

The maximum number of vehicles in service overall has increased by only 1.5% since 2007. The greatest growth in regional vehicles operated has been in the Metro Mobility system, which has grown by nearly 29% since 2007. This growth has been driving largely by demand for the Metro Mobility service. By contrast, the largest reduction in regional vehicles operated has been in the MTS dial-a-ride programs after consolidation under the Transit Link program.

As of 2011, more than two out of every three vehicles are used on regular-route transit, whether bus or rail. The remaining vehicles are used for dial-a-ride service such as Metro Mobility or Transit Link.

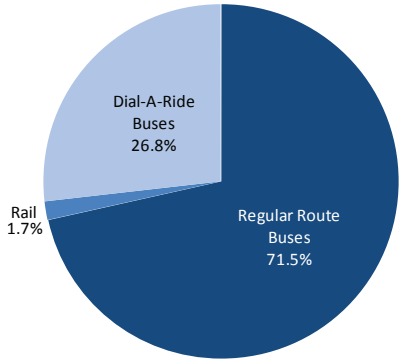


Figure 4-14: 2007 Max Vehicles in Service: 1,593 Total

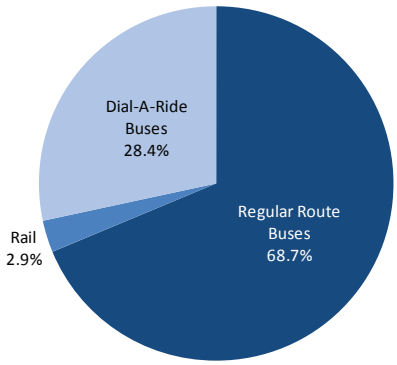


Figure 4-15: 2011 Max Vehicles in Service: 1,617 Total

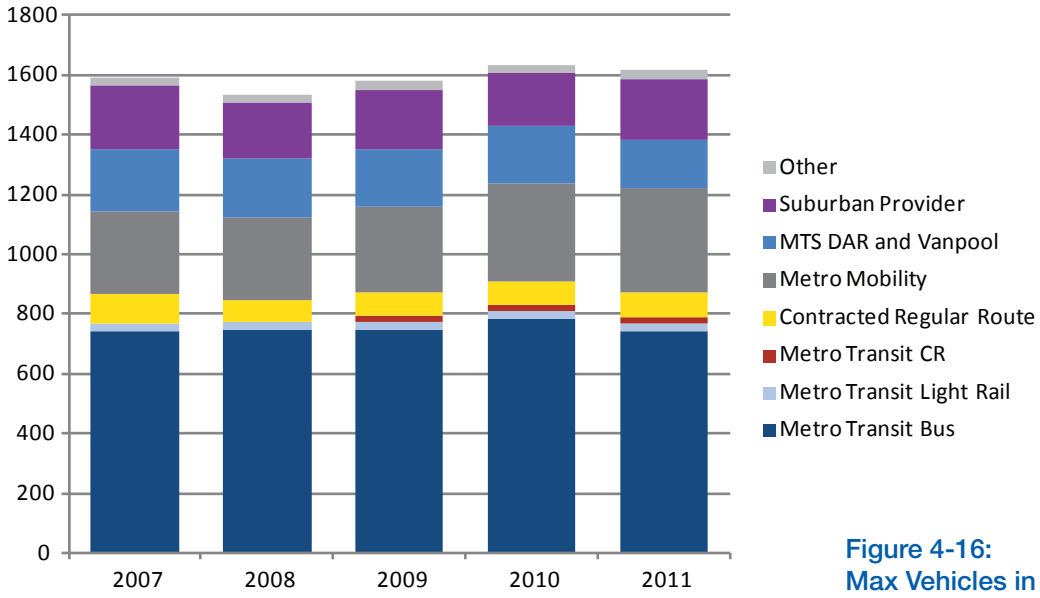


Figure 4-16: Max Vehicles in Service

Table 4-21: Maximum Vehicle Requirement, by Year and Provider

Max In-Service Vehicles	2007			2008			2009			2010			2011		
	Regular Route	Dial-a-Ride	Total	Regular Route	Dial-a-Ride	Total	Regular Route	Dial-a-Ride	Total	Regular Route	Dial-a-Ride	Total	Regular Route	Dial-a-Ride	Total
Metropolitan Council															
Metro Transit Bus	740	-	740	747	-	747	746	-	746	782	-	782	741	-	741
Metro Transit Light Rail	27	-	27	27	-	27	27	-	27	27	-	27	27	-	27
Metro Transit Commuter Rail	-	-	-	-	-	-	23	-	23	23	-	23	20	-	20
MTS Contracted	101	-	101	72	-	72	78	-	78	77	-	77	84	-	84
MTS Dial-a-Ride	-	140	140	-	128	128	-	126	126	-	135	135	-	92	92
Metro Mobility	-	273	273	-	274	274	-	283	283	-	326	326	-	351	351
Vanpool	68	-	68	71	-	71	66	-	66	60	-	60	65	-	65
Council Subtotal	936	413	1,349	917	402	1,319	940	409	1,349	969	461	1,430	937	443	1,380
Suburban Transit Providers															
MVTA	90	-	90	91	-	91	96	-	96	99	-	99	99	-	99
SouthWest Transit	61	-	61	42	-	42	48	-	48	48	-	48	50	-	50
Maple Grove	13	4	17	1	4	4	2	4	6	1	4	5	1	5	6
Plymouth	28	8	36	28	7	35	28	7	35	27	6	33	27	9	36
Shakopee	9	-	9	9	-	9	10	-	10	10	-	10	10	-	10
Prior Lake	3	-	3	4	-	4	6	-	6	3	-	3	5	-	5
Suburban Provider Subtotal	204	12	216	175	11	186	190	11	201	165	11	176	192	14	206
Metro Transit/ Suburban[1]	57	-	57	35	-	35	29	-	29	30	-	30	31	-	31
Other Providers															
U of Minnesota	18	2	20	20	2	22	19	2	21	19	2	21	23	2	25
Ramsey Star	2	-	2	2	-	2	2	-	2	2	-	2	2	-	2
NCDA	6	-	6	6	-	6	6	-	6	-	-	-	-	-	-
Rush Line Express	-	-	-	-	-	-	-	-	-	4	-	4	4	-	4
Total	**1,166**	**427**	**1,593**	**1,120**	**415**	**1,535**	**1,157**	**422**	**1,579**	**1,159**	**474**	**1,633**	**1,158**	**459**	**1,617**

1. Metro Transit provides service under contract to the some Suburban Transit Providers. These numbers are reflected in the Metro Transit total but not the Suburban Providers total.

Customer Facilities

The facilities and capacity of the Twin Cities regional park-and-ride system are continuously in flux as new facilities are opened, underutilized facilities are closed, facilities are temporarily closed for expansions, and temporary facilities are used during expansion or until permanent facilities can be constructed. The Twin Cities area had 110 active park-and-ride lots as of 2012, with a total capacity of approximately 30,000 spaces. This is up from a capacity of approximately 15,500 spaces in fall 2002, nearly doubling the regional capacity in the past decade years. In 2012, the capacity was about 60% utilized on an average weekday but the capacity is available for projected park-and-ride demand in the future.

Even though there are 111 lots, 54% of spaces are concentrated in the 20 largest lots. The three largest – the Burnsville Transit Station, 28th Avenue Station, and I-35W and 95th Ave. – have approximately 15% of the region's total park-and-ride capacity.

Spaces are provided through three types of arrangements. Some park-and-rides are owned by transit agencies like Metro Transit or Suburban Transit Provider organizations. Others are owned by MnDOT, typically on excess highway right-of-way and used under agreement between MnDOT and the transit agency. And, some are joint use with private entities like theaters, shopping centers, or churches. Park-and-rides are served by Metro Transit and the region's suburban transit agencies. Metro Transit and Metropolitan Council account for about 64% of park-and-ride spaces. MVTA, the suburban transit provider with the most park-and-ride spaces, accounted for 16% of all spaces in 2012.

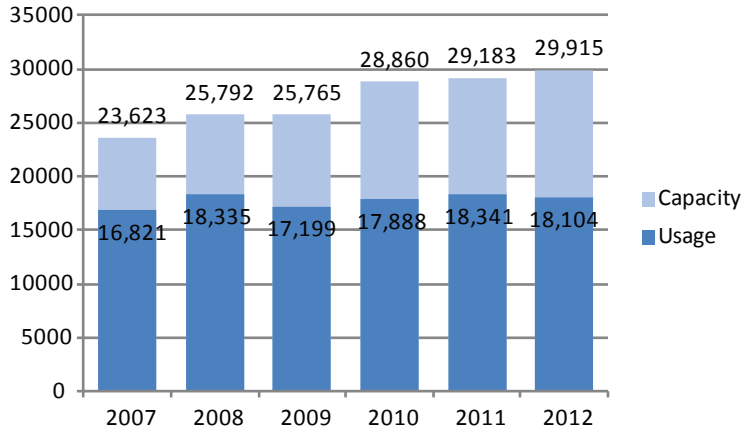


Figure 4-17: Park-and-Ride Usage and Capacity, 2007 - 2012

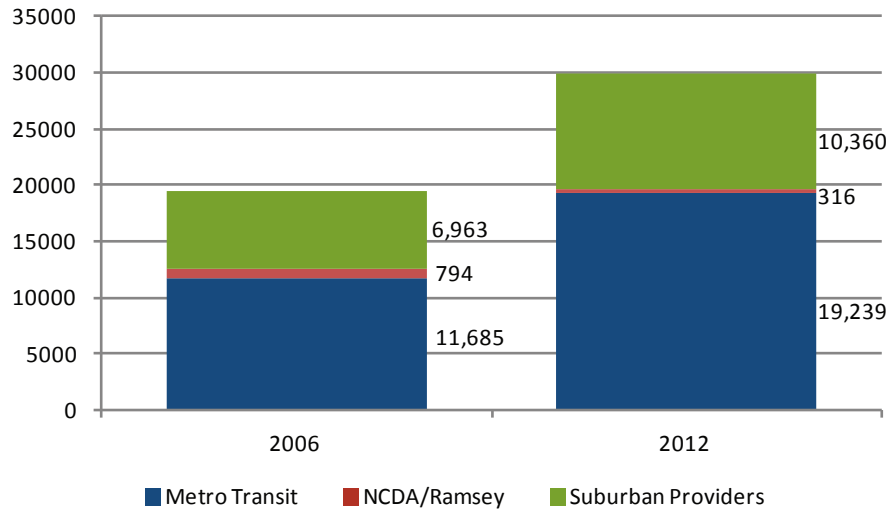


Figure 4-18: Park-and-Ride Spaces, All Providers

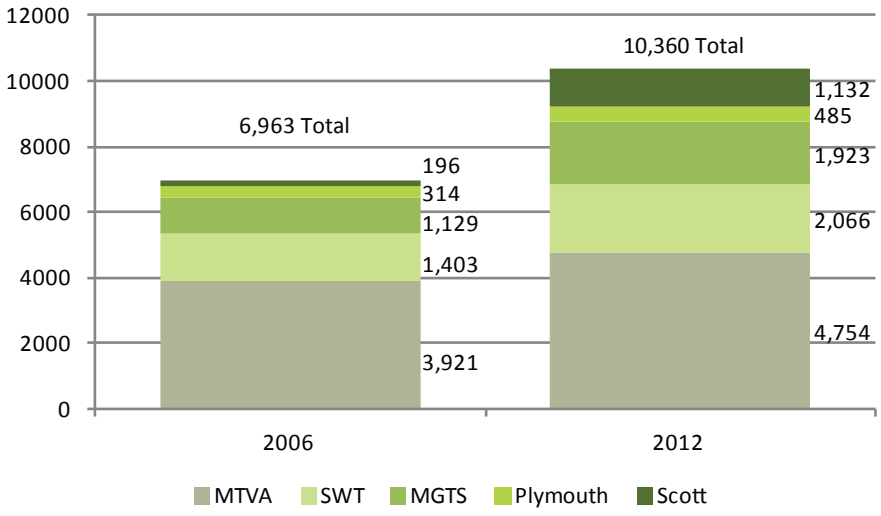


Figure 4-19: Park-and-Ride Spaces, Suburban Providers

Table 4-22: Average Daily Park-and-Ride Capacity and Usage by Provider

	2007		2008		2009		2010		2011		2012	
Provider	**Capacity** / **Usage**	**% Full**	**Capacity** / **Usage**	**% Full**	**Capacity** / **Usage**	**% Full**	**Capacity** / **Usage**	**% Full**	**Capacity** / **Usage**	**% Full**	**Capacity** / **Usage**	**% Full**
Metro Transit	14,026 / 9,840	70.2%	15,220 / 10,899	71.6%	16,029 / 10,685	66.7%	19,232 / 11,642	60.5%	19,177 / 11,682	60.9%	19,239 / 11,497	59.8%
MVTA	4,025 / 3,221	80.0%	4,400 / 3,279	74.5%	4,472 / 2,907	65.0%	4,754 / 2,884	60.7%	4,754 / 3,013	63.4%	4,754 / 2,962	62.3%
SouthWest Transit	1,382 / 1,370	99.1%	1,982 / 1,492	75.3%	1,982 / 1,447	73.0%	1,785 / 1,442	80.8%	1,821 / 1,500	82.4%	2,066 / 1,486	71.9%
Maple Grove	1,601 / 1,216	86.0%	1,601 / 1,353	84.5%	1,601 / 1,239	77.4%	1,601 / 1,234	77.1%	1,923 / 1,356	70.5%	1,923 / 1,333	69.3%
Plymouth	484 / 317	65.5%	485 / 279	57.5%	485 / 221	45.6%	485 / 248	51.1%	485 / 258	53.2%	485 / 288	59.4%
Prior Lake/ Shakopee	708 / 229	32.3%	707 / 275	38.9%	707 / 334	47.2%	707 / 284	40.2%	707 / 359	50.8%	1,132 / 362	32.0%
NCDA/City of Ramsey	1,397 / 628	45.0%	1,397 / 758	54.3%	489 / 405	82.8%	296 / 154	52.0%	316 / 173	54.7%	316 / 176	55.7%
Total	**23,623** / **16,821**	**71.2%**	**25,792** / **18,335**	**71.1%**	**25,765** / **17,198**	**66.7%**	**28,860** / **17,888**	**62.0%**	**29,183** / **18,341**	**62.8%**	**29,915** / **18,104**	**60.5%**

Every other year, the region surveys park-and-ride facilities to determine the home location of users. The most recent survey was conducted in fall 2012. Park-and-ride users come from throughout the region including outside the Transit Capital Levy Communities and even beyond the seven-county metropolitan boundary.

Table 4-23: 2012 Park-and-Ride User Home Origin Survey

User Home Origins	% of Total
Inside Transit Capital Levy Communities (TCLC)	73%
Outside TCLC but Inside 7-County Metro	10%
Outside of the 7-County Metro Area	17%
Total	**100%**
Minnesota Users	97%
Wisconsin Users	3%
Total	**100%**

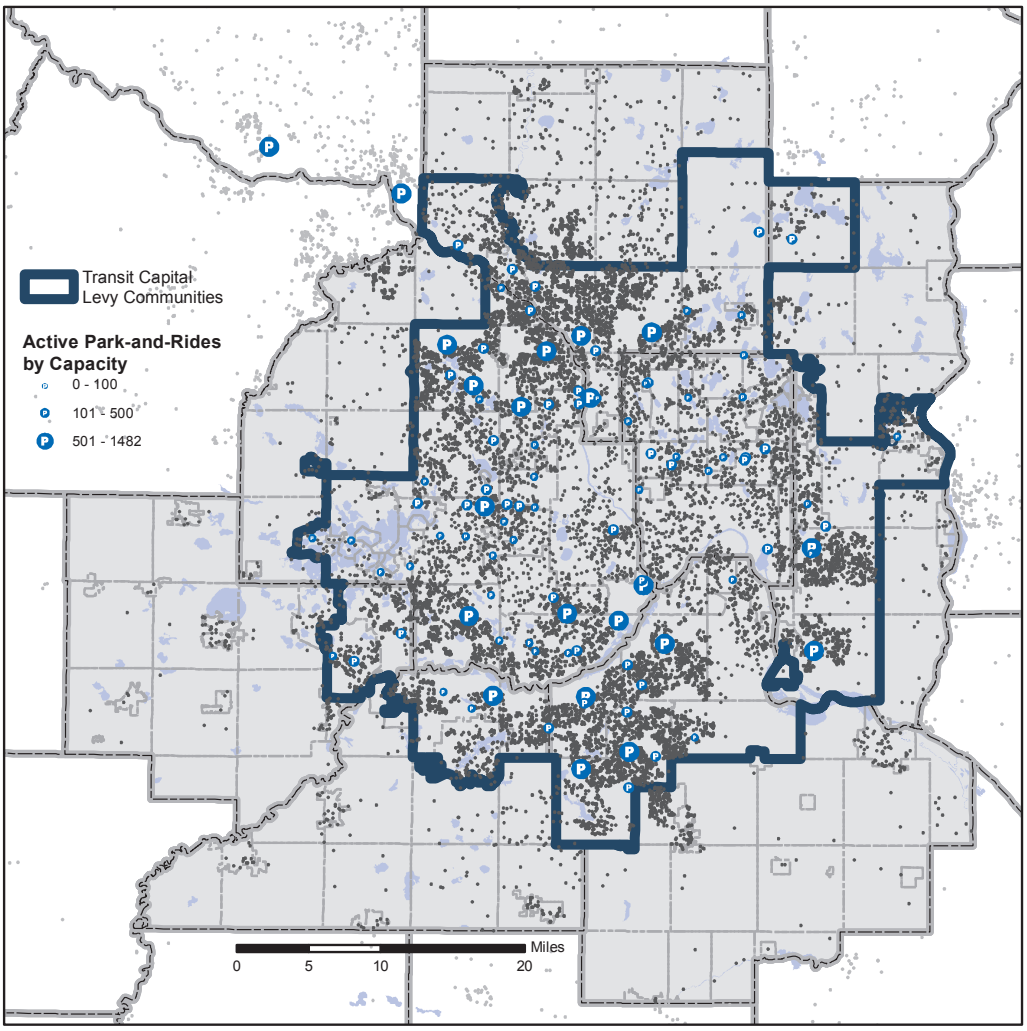


Figure 4-20: Park-and-Ride Users home locations – survey Fall 2012

Transit centers and stations are built to improve waiting conditions and facilitate transfers among buses and trains. Currently, there are 28 transit centers throughout the system, of which 10 are located adjacent to a park and ride. Riders access the light-rail and commuter rails system at 25 stations. In 2013, four bus rapid transit stations will be served by the new METRO Red Line BRT service.

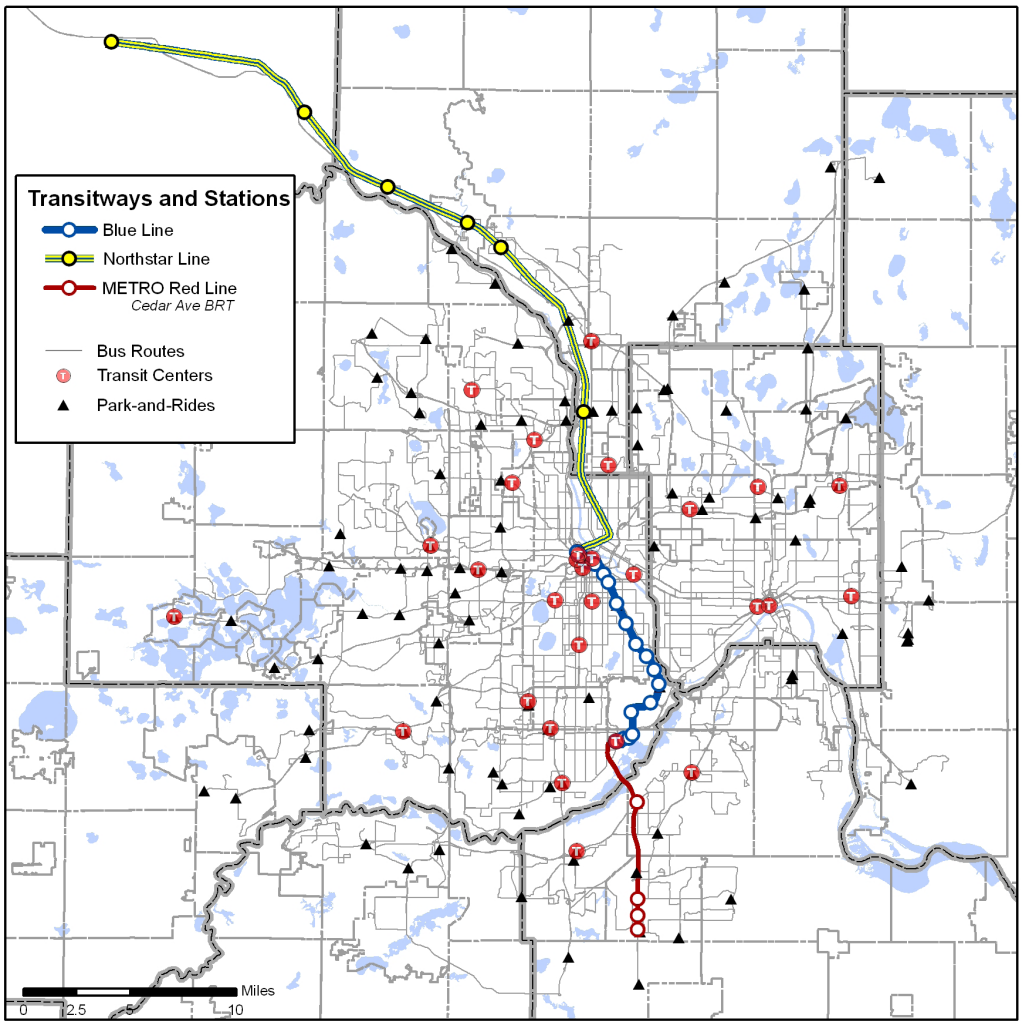


Figure 4-21: Map of Transit Centers and Stations

Support Facilities

The Twin Cities Transit System is served by a variety of support facilities. Metro Transit currently has 12 vehicle and facility-related support facilities with the other facilities servicing Metro Mobility, Suburban Transit Providers, MTS, and other contracted service vehicles. Metro Transit also has a transit control center (TCC) and other operations-related facilities. All facilities, except those located in Big Lake, are located in the seven-county metro area. Several facilities are shared between providers and services.

Table 4-24: Contracted Support Facilities

Garages	Location	Regular Route	Dial-a-Ride	Providers
First Transit	Blaine	12	-	MTS
First Transit	Mpls. – Spring Street	45	8	Plymouth, MTS
First Transit	Mpls. – Como	68	-	MTS, U of MN, Plymouth
First Transit	Roseville	-	201	Metro Mobility
Lorenz Bus Service	Blaine	15	-	MTS
Lorenz Bus Service	Spring Lake Park	8	-	MTS
Schmitty & Sons	Lakeville	18	-	Prior Lake, Shakopee, MVTA
Transit Team	Minneapolis	-	155	Metro Mobility
Canvas Health	Stillwater Township	-	7	Metro Mobility
DARTS	West St. Paul	-	46	MTS, Metro Mobility
Midwest Paratransit	Hassan Twp	1	39	MTS, Maple Grove
MV Transportation	Coon Rapids	8	17	Anoka County (MTS)

Table 4-25: Directly Operated (Owned) Support Facilities

Facilities	Location	Regular Route	Dial-a-Ride	Providers
MVTA	Eagan	57	-	MVTA
MVTA	Burnsville	58	-	MVTA
Southwest Transit	Eden Prairie	61	-	SouthWest Transit
Scott County	Shakopee	7	27	MTS, Metro Mobility, Prior Lake, Shakopee
Heywood Garage	Minneapolis	248	-	Metro Transit
Ruter Garage	Brooklyn Center	149	-	Metro Transit
South Garage	Minneapolis	141	-	Metro Transit
Nicollet Garage	Minneapolis	166	-	Metro Transit
East Metro Garage	St. Paul	205	-	Metro Transit
Overhaul Base	St. Paul	N/A	-	Metro Transit
Light Rail Facility	Minneapolis	28	-	Metro Transit
Maintenance of Way	Minneapolis	N/A	-	Metro Transit
Hoover Street	Minneapolis	N/A	-	Metro Transit
BNSF Crew Facility	Minneapolis	N/A	-	Metro Transit
Northstar Facility	Big Lake	3	-	Metro Transit
Hiawatha Rail Support Facility	Minneapolis	N/A	-	Metro Transit

Transit Advantages

Transit is able to make use of facilities in the transportation system that give it a travel time and flow advantage over regular traffic.

State law allows shoulder lanes on highways to be used by buses to bypass congestion and to improve travel times over automobiles. Most of these bus shoulders are 10 to 12 feet wide, wider than the typical shoulder that was constructed solely for automobile breakdowns and emergency vehicles. These lanes are also signed as being for bus use only. In 1992, the Twin Cities first bus only shoulder was constructed. Since that time, there has been a dramatic growth in the number of bus-only shoulders in the Twin Cities. The growth of bus-only shoulders continues to be restricted by funding and the decreasing availability of potential bus only shoulder sites, whether through completion of such shoulders or physical constraints. In 2008, the opening of new Highway 212 in Carver County contributed to a significant increase in bus-only shoulder lanes in the metro area.

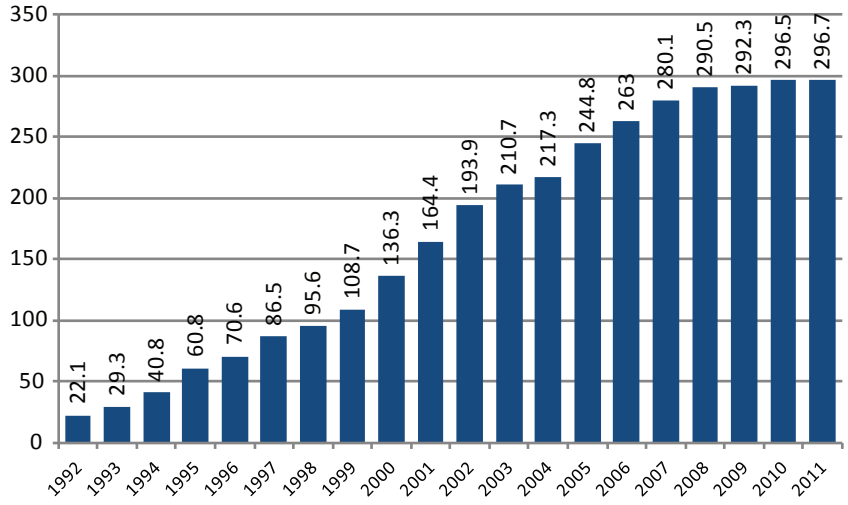


Figure 4-22: Miles of Bus-Only Shoulder

In addition to bus-only shoulders, the region has several other transit facilities that give an advantage to transit vehicles. Those include:

- High-occupancy toll (HOT) lanes
- Ramp meter bypass lanes
- Dedicated busways (U of M transitway)
- Dedicated local bus lanes, primarily in downtown Minneapolis and St. Paul

Table 4-26: 2012 Summary of Existing Transit Advantages

Year	Shoulder Lane Miles	High-Occupancy Toll Lane Miles	Ramp Meter Bypasses	Busway Lane Miles	Bus Lane Miles (Local)
2012	296.7	53.4	94	6.2	12.5

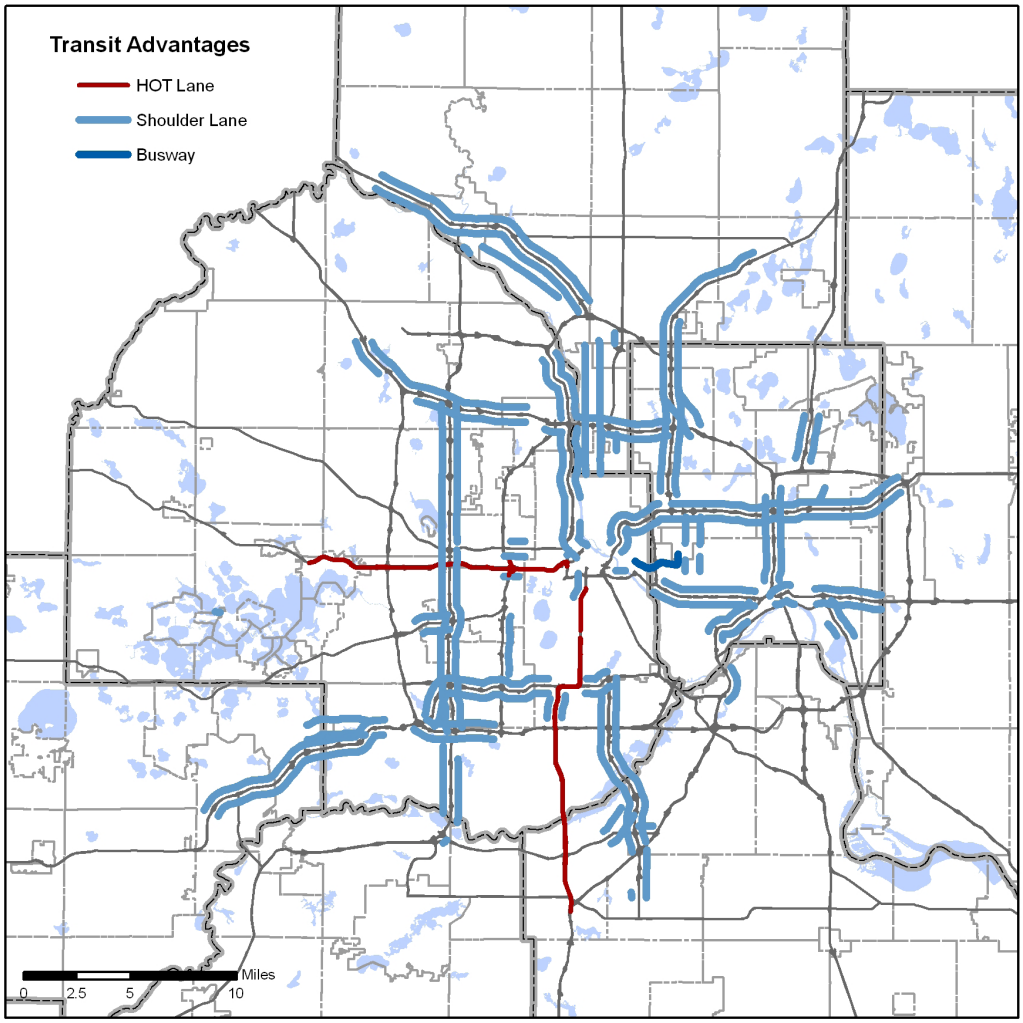


Figure 4-23: Map of Bus Shoulders and HOT Lanes

Transitways

The *2030 Transportation Policy Plan* (TPP) envisions the development of a network of transitways. Transitways are investments in high-demand corridors that allow for fast, reliable travel between regional destinations. Beginning with the opening of the Hiawatha light rail line (now the METRO Blue Line) in 2004, the Twin Cities region has started a build out of a network of transitways throughout the metropolitan area. In 2009, the Northstar commuter rail line, the first of its kind in the region, opened in the northwest metro. In 2012, two transitways were undergoing construction; the Cedar Avenue bus rapid transit (METRO Red Line) and the Central Corridor light rail (METRO Green Line), projected to open in 2013 and 2014, respectively. In addition to the lines under construction, several transitways are in the design or engineering phases, including I-35W South bus rapid transit (METRO Orange Line) and the Southwest light rail (METRO Green Line extension). The opening timeframe for these lines will become more clear as the projects progress.

Transitway	Mileage	Stations (When Open)
Complete		
I-394 HOT Lane Express Bus Service	11	4 corridor park-and-rides (24 off-corridor facilities provide service utilizing HOT lanes)
Hiawatha Light Rail (Blue Line)	12	19
Northstar Commuter Rail	40	7
Construction		
Central Corridor (Green Line)	9 new miles *(2 existing miles in Minneapolis)*	18 new stations *(Also will serve 5 existing Hiawatha stations in Minneapolis)*
Cedar Ave Bus Rapid Transit (Red Line) – Phase I	Lakeville to Mall of America – 11	4 new stations *(Connects to 2 existing Hiawatha LRT stations in Bloomington)*
Design/Engineering		
I-35W South BRT (Orange Line)	16	6 stations *(Does not include downtown stops)*
Southwest LRT (Green Line Extension)	15	17 new stations proposed *(Also will serve 5 existing Hiawatha stations in Minneapolis)*

In addition to the lines that are open or in development, there are numerous transitway project under study or planning where the final project mode and alignment have yet to be determined.

Transitway	Transitway Status
Corridor Studies	
Bottineau Transitway	Hennepin County Regional Railroad Authority has been leading an Alternatives Analysis (AA) to study light rail and bus alternatives between the northwest suburbs and downtown Minneapolis. In June 2012, HCRRA recommended a 13-mile light rail line to Brooklyn Park for amendment into the region's TPP. As of February 2013, the Metropolitan Council was hosting a public comment period on the proposed amendment.
Gateway Corridor	The Gateway Corridor Commission has been leading an AA study to look at bus and rail alternatives from Minneapolis and St. Paul to the east with a study area that roughly straddles I-94. In late 2012, the Commission recommended an alignment along Hudson Road to the eastern edge of Woodbury as the preferred alignment, with bus rapid transit in a dedicated guideway and light rail transit still under consideration for modes. Work will continue on a draft environmental impact statement (DEIS) in 2013.
I-35W North	The Minnesota Department of Transportation conducted a managed lanes corridor study on I-35W from downtown Minneapolis north to Forest Lake. The study primarily looked at the feasibility of managed lane concepts in the corridor, but an analysis was also done on the feasibility of highway bus rapid transit in the corridor. The study determined there was significant demand for highway BRT in the corridor and identified concepts for how it might relate to a managed lane investment in the corridor.

Transitway	Transitway Status
Midtown Corridor	Metro Transit is leading an AA study on the Midtown Corridor. The corridor will look at transit options, including the Midtown Greenway and Lake Street, in south Minneapolis between the existing Lake Street Station on the Hiawatha (Blue) Line and the proposed West Lake Station on the Southwest (Green) Line. The study began in 2012 and is expected to conclude in 2014.
Nicollet-Central Urban Circulator	The City of Minneapolis is leading an AA study on Nicollet and Central Avenues in Minneapolis after receiving an FTA 5339 grant award for the project. The study began in 2012 and is focusing on bus and streetcar alternatives in the corridor. The study is expected to conclude in late 2013.
Rush Line Corridor	The Rush Line Task Force analyzed multiple transit alternatives for the corridor in a study completed in 2009. The study concluded that LRT and BRT on two different alignments should be studied through an advanced alternatives study. In addition to the study, the Rush Line Task Force funded a demonstration express bus route from Forest Lake to downtown St. Paul from 2010 to late 2012. At the end of the demonstration service, Metro Transit incorporated some of the demonstration service features into the corridor's regular express bus service.
Red Rock Corridor	A commuter rail feasibility study was completed in 2001 and an AA initiated in July of 2004. The AA identified and analyzed commuter rail, bus rapid transit, and express bus as transit modes that could meet the purpose and need for the corridor. Work has begun on Station Area and Site Master Planning to identify four station sites along the corridor in anticipation of express bus, BRT, or commuter rail. An AA Update (AAU) was initiated in January 2013.
Robert Street Transitway	Dakota County and Ramsey County RRAs are jointly leading an AA study on the Robert Street transitway. The study began in 2012 after an FTA 5339 grant was awarded to the project for the study based on results from a feasibility study completed in 2008. The study is expected to look at several mode and alignment options in the study area and is expected to conclude in 2014.
Multi-Corridor Studies	
Arterial Bus Rapid Transit Corridors	Metro Transit completed an effort to analyze the costs and benefits of arterial BRT in 12 corridors in the region through the Arterial Transitway Corridor Study. The study resulted in concept plans for the nine arterial BRT corridors in the TPP. The study also prioritized corridors for implementation based on project merits and readiness factors. Three additional corridors have been identified for possible arterial BRT implementation. Metro Transit is working toward the development of the first arterial BRT line, the Snelling Avenue corridor, while also organizing resources for future lines. Construction on the first line could begin in 2014.
Highway Transitway Corridors	Metropolitan Council is leading an effort to study highway transitway corridors for bus rapid transit development in order to determine the potential costs and benefits of such a system. Eight corridors will be studied for concept-level investments and the study results are expected to be available in 2013.

Peer Transit Systems

The Twin Cities transit system performance is assessed, in part, using data from the federal National Transit Database (NTD). The area's performance is compared to the performance of a peer group of 11 urban area transit systems. A map of peer regions is Figure 2-3 on page 5 of this report.

Table 4-27: Peer Urban Areas Used in Transit Evaluation

Baltimore	Cleveland	Dallas	Denver	Houston	Milwaukee
Phoenix	Pittsburgh	Portland	San Diego	Seattle	St. Louis

Peer Modes

Peer groups were originally established in 1996 and regions were selected that were similar both in size and in composition of transit service. Over the intervening years, changes in transit agencies, services provided, and regional demographics have led the Council to reevaluate the peer regions and their agencies. Since 1996, two regions have been added to the list (San Diego and Phoenix) while two other regions from past reports were eliminated (Cincinnati and Buffalo).

All regions operate some form of regular bus service. As of 2012, all of the peers except Milwaukee had light rail transit in operation. The Twin Cities area's first light-rail line became operational in June 2004. Other regions, including Houston, Pittsburgh, Denver, Portland, Seattle, Phoenix, and Dallas have added light rail transit or have expanded their existing system in recent years. The other modes operated as of the date of these statistics, the end of 2008, are shown in Table 4-28.

Table 4-28: Peer Region Transit Modes

	Bus	Heavy Rail	Comm. Rail	Light Rail/ Street-car	Van Pool	Other	Other, Description
Baltimore	X	X	X	X			
Cleveland	X	X		X			
Dallas	X		X	X	X		
Denver	X			X	X		
Houston	X			X	X		
Milwaukee	X				X		
Phoenix	X			X	X		
Pittsburgh	X			X	X	X	Inclined Plane
Portland	X		X	X	X		
St. Louis	X			X	X		
San Diego	X		X	X	X		
Seattle	X		X	X	X	X	Trolley Bus, Monorail
Twin Cities	X			X	X		

Commuter rail generally travels longer distances connecting central cities to suburban and exurban sites. It typically operates on existing or abandoned freight rail tracks with greater distances between stations than heavy rail or light rail. Opened in November 2009, the Twin Cities Northstar commuter rail

line is an example of such a technology. Heavy rail typically represents grade-separated rail operating in dense urban environments with shorter station spacing (often underground).

Table 4-29: Peer Region Densities

Region	Population (2010 Urban Area)[1]	Land Area (Sq. Mi.)	Population Density
Baltimore	2,203,663	717	3,073
Cleveland	1,780,673	772	2,307
Dallas	5,121,892	1,779	2,879
Denver	2,374,203	668	3,554
Houston	4,944,332	1,660	2,979
Milwaukee	1,376,476	546	2,521
Peer Average	2,765,079	949	2,915
Phoenix	3,629,114	1,147	3,164
Pittsburgh	1,733,853	905	1,916
Portland	1,849,898	524	3,530
San Diego	2,956,746	732	4,039
Seattle	3,059,393	1,010	3,029
St. Louis	2,150,706	924	2,328
Twin Cities	2,650,890	1,022	2,594

1. Peer regions in Chapter 2: Demographics were compared at the Metropolitan Statistical Area (MSA) level. The urban area numbers used here just represent the developed area of the MSA, thus will be smaller than the MSA totals in Chapter 2.

In addition, demand-response service to meet the requirements of the Americans with Disabilities Act is provided in all areas. In the Twin Cities, this service is provided primarily by Metro Mobility.

Peer Statistics

Population

When looking at the performance of peer region transit systems, it is important to consider both population and density, particularly of the urban area, which fixed-route transit service will be most effective.

The largest two peer regions are Dallas, TX and Houston, TX. However, the most dense peer regions are San Diego, CA and Denver, CO. The varying level of population density contributes to the overall effectiveness of most intensive transit services, such as light rail.

Ridership

Annual transit ridership grew at a faster rate in the Twin Cities from 2005 to 2011 when compared with the peer region average. Most regions experienced ridership growth until 2008 and then drops in ridership in 2009 and 2010 coinciding with the economic recession. The Twin Cities was one of only two regions to begin recovering in 2010 while most peer regions were still seeing ridership decreasing. From 2009-2011, the Twin Cities transit ridership grew faster than all but one peer region. From a longer-term perspective, the Twin Cities has the fourth highest growth rate in ridership from 2001-2011 among peer regions. Ridership in the Twin Cities is expected to grow as the transitway system and supporting bus system is expanded in the next 10 years. Currently, the region has the second largest bus ridership among peer regions

but significantly less rail ridership than many peer regions. With the opening of the Green Line in 2014 and the possible opening of the Green Line extension, regional rail ridership could triple by 2018.

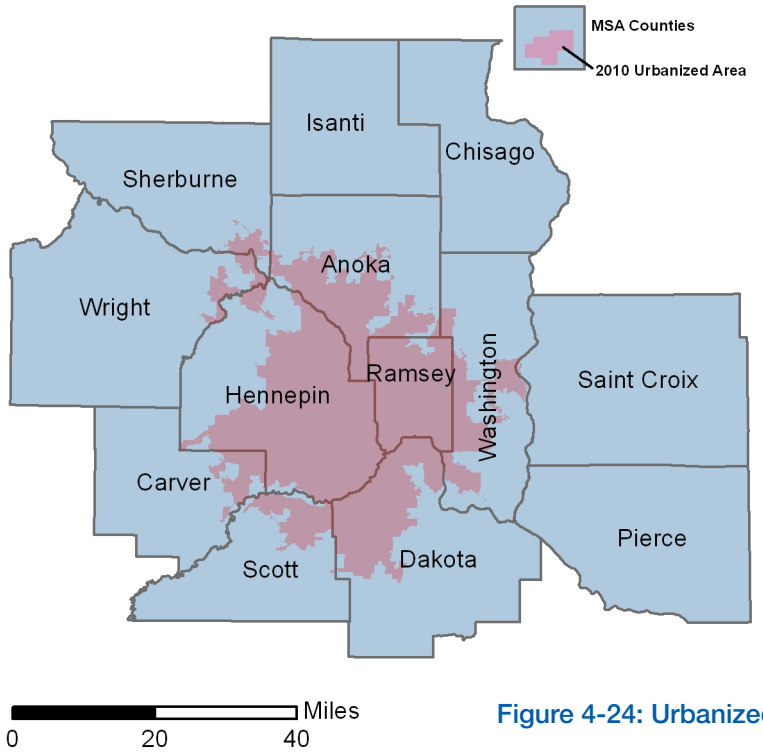


Figure 4-24: Urbanized Area with MSA

Table 4-30: Twin Cities Region Annual Transit Ridership, 2006-2011 (nearest thousand)

	Twin Cites Region Ridership	Peer Region Ridership (Average)
2005	80,768,000	82,913,000
2006	85,308,000	86,106,000
2007	88,943,000	87,273,000
2008	94,770,000	91,247,400
2009	88,931,000	88,494,000
2010	91,065,000	82,828,000
2011	93,915,000	84,671,000

Twin Cities Ridership Change 05 - 11	13,147,000
Twin Cities Ridership Change 05 - 11	16.3%
Ridership Change Peer Group 05 – 11	1,758,000
Ridership Change Peer Group 05 – 11	2.1%

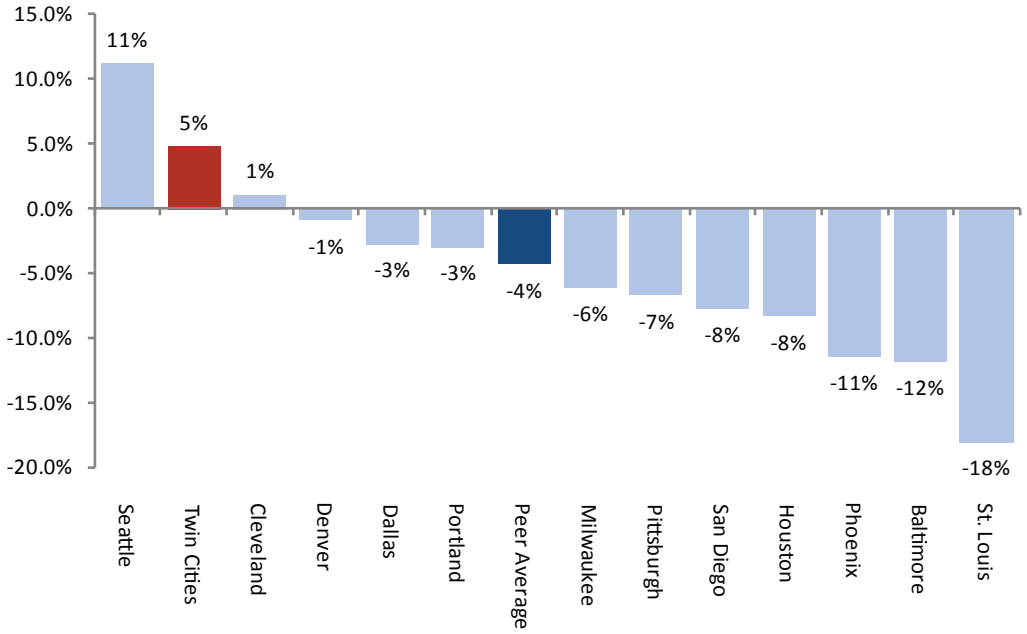


Figure 4-25: Annual Ridership Change 2009-2011

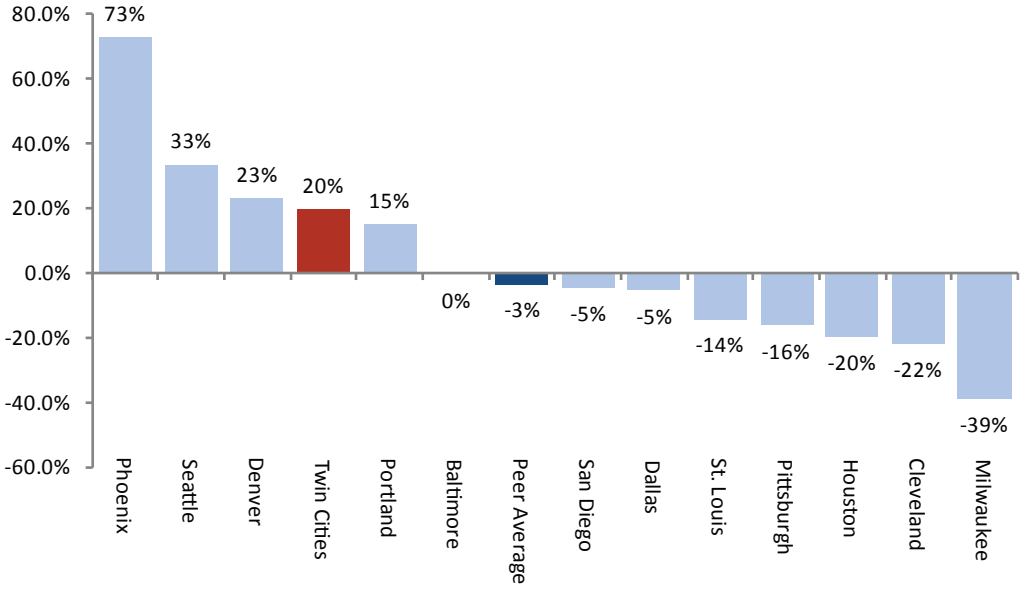


Figure 4-26: Annual Ridership Change 2001-2011

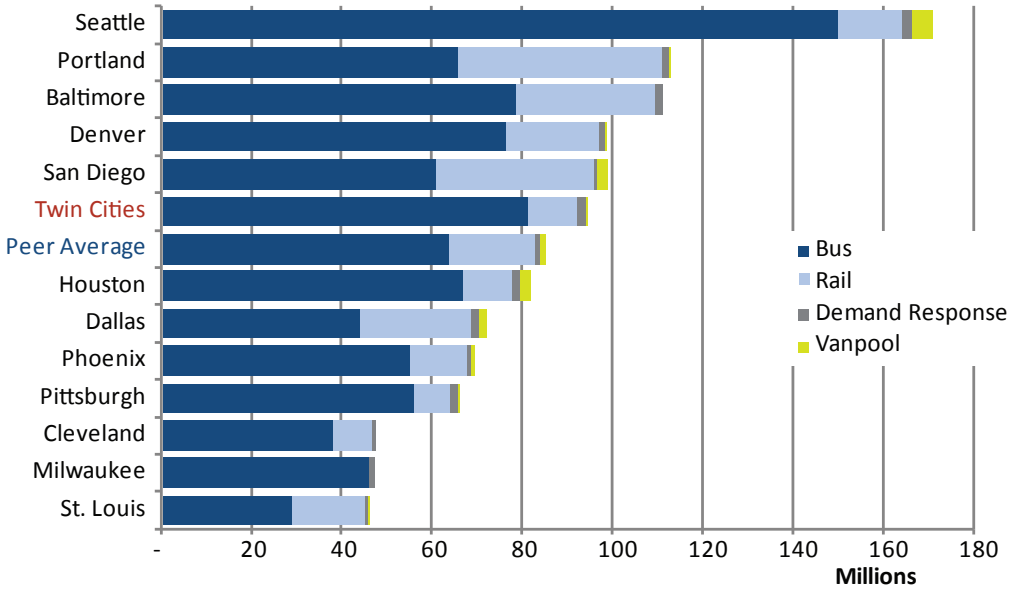


Figure 4-27: 2011 Regional Ridership, by Transit Mode

Expenses

Spending for operating transit in the Twin Cities increased 31.2% between 2005 and 2011 as compared to 33.2% for peer regions. When adjusted for inflation, the rate of increase for the peer regions was about 13.8%, higher than the Twin Cities rate of 12.1%.

Table 4-31: Twin Cities Region Annual Transit Operating Costs, 2005-2011

	Actual	Inflation Adjusted
2005	$293,694,000	$293,694,000
2006	$306,413,000	$296,314,000
2007	$325,944,000	$303,869,000
2008	$346,877,000	$297,057,000
2009	$360,949,000	$319,411,000
2010	$377,601,000	$330,995,000
2011	$385,292,000	$329,196,000
Percent Change 2005-2011		
Twin Cities	31.2%	12.1%
Average 12 Peer Regions	33.2%	13.8%
Average Annual Percent Change 2005-2011		
Twin Cities	5.2%	2.0%
Average 12 Peer Regions	5.5%	2.6%

Inflation adjustment reflects 2005 dollars using, *General freight trucking, local PPI Measures*

Performance Measures

The measure *net government cost per passenger*, or subsidy, is the cost made up by government subsidies after **user** revenues are deducted. The source of this funding is a combination of federal, state, and local tax revenues as well as other revenues such as advertising. The Twin Cities net subsidy per passenger increased by $0.27 or 10%, while the peer region subsidy increased dramatically, reaching an average of $3.54. That is a $0.72 or 25.5% increase over the 2005 subsidy per passenger. In 2011, the Twin Cities subsidy per passenger was 16.4% below that of peer regions.

The number of miles of transit service provided in the Twin Cities is above the peer average of regions. This is consistent with the level of funding provided for transit in the Twin Cities area and trails many similar sized regions that began expanding their systems earlier.

In 2011, the Twin Cities provided about 35.4 transit rides for every person in the region. This was above the peer average of 30.6 but about 41% less than Portland, which has the highest trips per capita of any peer region. This is due to a number of factors. The availability of transit in the Twin Cities is less (see Figure 4-29). In addition, a larger-than-typical portion of the operating cost is recovered through fares, giving an economic disincentive to riders. The Twin Cities also has two downtowns to serve and, therefore, jobs are split between two locations rather than focused on one traditional downtown.

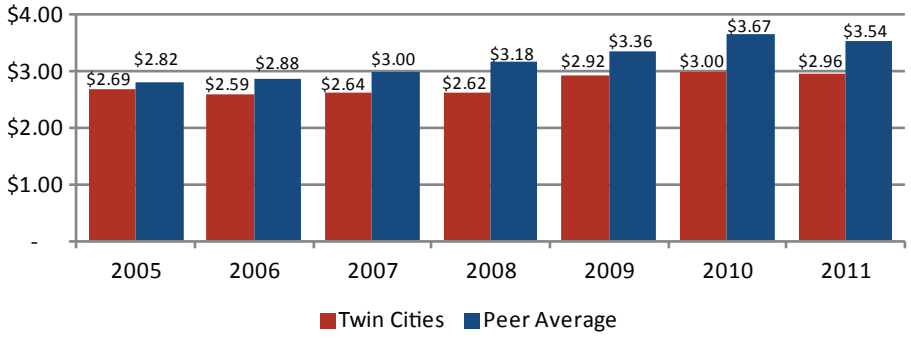


Figure 4-28: Subsidy per Passenger Trip

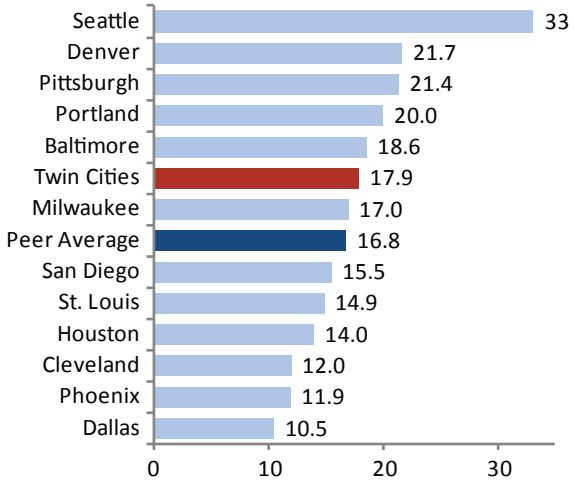


Figure 4-29: Miles of Transit Service per Capita

2011 NTD Regional Figures – Population is 2010 urbanized population

The region ranks third in the peer group in terms of farebox recovery—the percentage of operating costs covered by passenger fares. Fares paid by the region's transit riders cover 28.6% of transit operating costs compared to only 23.1% at the average region in the peer group. Farebox recovery rates for the Twin Cities dropped to a low of 23.8% in 2004, partly due to a transit driver strike. The farebox recovery rate recently increased to 26.7% in 2005 and 28.0% in 2007 with the addition of light rail and ridership increases.

Peer regions provide more funding per capita than the Twin Cities. Over a ten-year period, the peer average was 14% higher than the Twin Cities' average, even though this was the period during which Hiawatha light rail (METRO Blue Line) and Northstar commuter rail were built. Some other regions are building more transit, providing more transit, collecting fares at a lower rate. Seattle provided an additional three times more funding per capita for transit projects and operations than the Twin Cities.

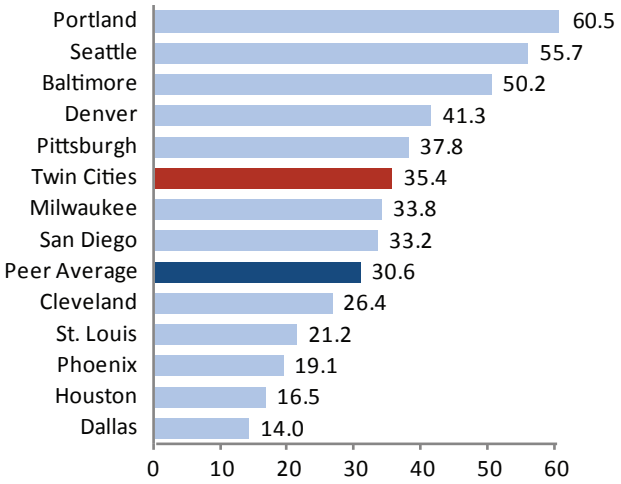


Figure 4-30: Annual Transit Trips per Capita

2011 NTD Regional Figures – Population is 2010 urbanized population

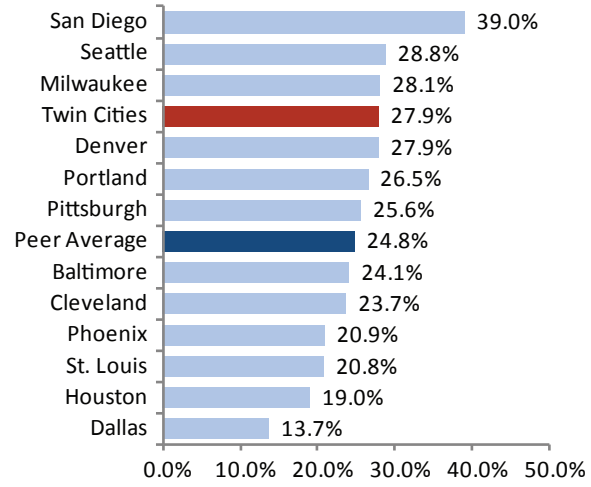


Figure 4-31: Fare Recovery Percentage

2011 NTD Regional Figures – Population is 2010 urbanized population

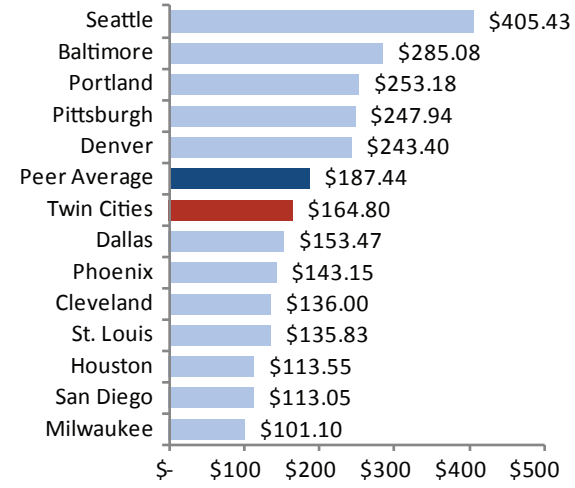


Figure 4-32: Annual Operating and 10-year Average Capital Subsidy per Capita

2011 NTD Regional Figures – Population is 2010 urbanized population

Trends Section

The pattern of change in transit ridership has been reflective of societal changes and system operating changes:

- Gas price increase
- Economic recession starting in 2008
- Beginning of economic recovery
- Opening of LRT and commuter rail

The impacts of these various changes can be seen graphically in Figure 4-33.

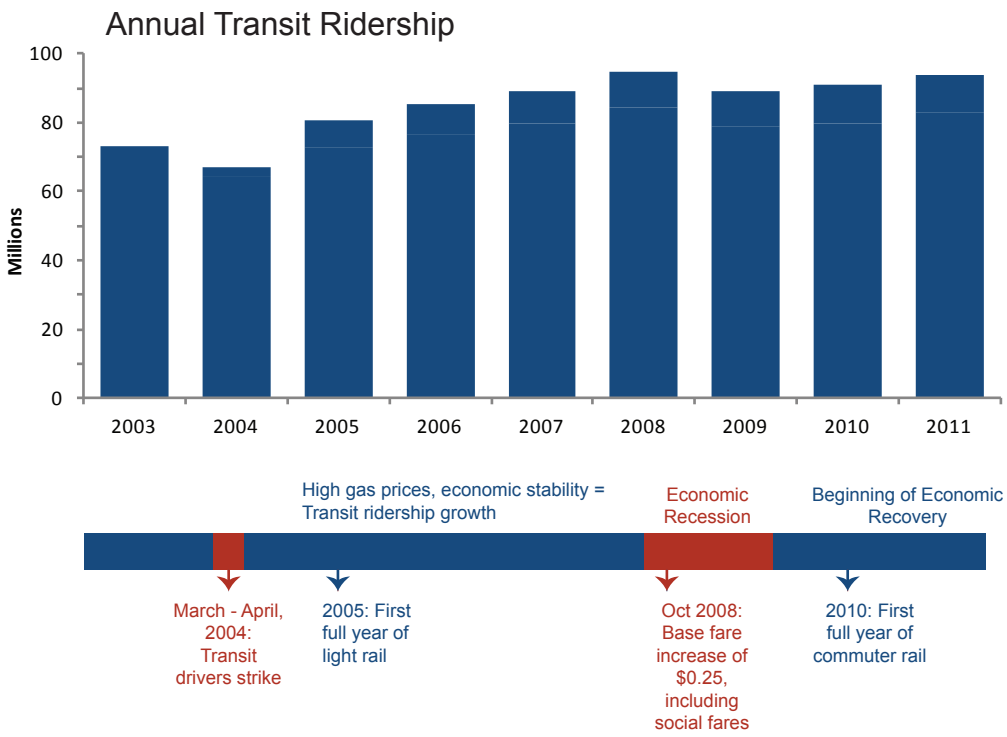


Figure 4-33: Annual Transit System Ridership and notable events

In 2004, the Metropolitan Council adopted the goal of doubling overall transit ridership by 2030. At the end of the year 2011, the Council was about 9 million rides above this goal. In 2004, a transit worker strike reduced ridership substantially but the opening of light rail in 2005 helped the system recovery quickly. By 2008, the region was about 22% ahead of the goal. However, the economic downtown in the late 2000's resulted in ridership decreases across the system in 2009. Ridership growth has returned in 2010 and 2011 thanks to the economic recovery, but the region is now only about 10% ahead of the goal in 2011.

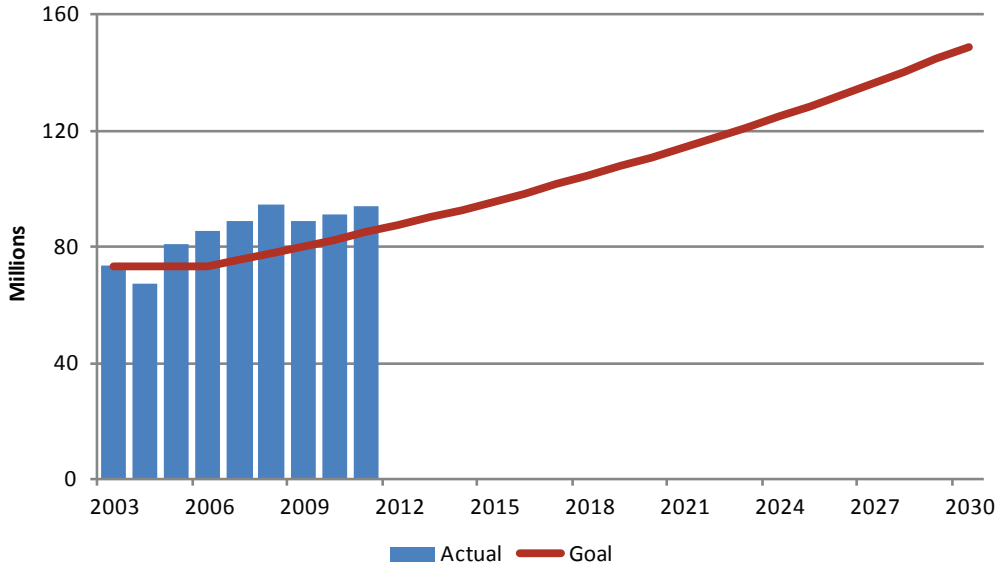


Figure 4-34: Ridership Doubling Goal

Chapter 5: Freight System

Freight System Description

Role of the Freight Transportation System

The freight transportation system plays a critical role in supporting the region's economic status, competitiveness, and quality of life, allowing it to stand out as an important business and transportation hub. The Twin Cities has recently ranked fifth nationally among major cities for transportation infrastructure and Minneapolis also has ranked fifth nationally for business climate. In 2006, *Logistics Today* named the Twin Cities a top 10 logistics-friendly area based on categories such as road conditions, infrastructure, and access to ports and railroads.

Without a safe, efficient, reliable, and robust freight transportation system, many residents would not have access to the goods and materials they need to live, work, and for recreation. Many businesses would not be able to distribute their products to customers or receive shipments needed to manufacture items.

Contributions of Freight Modes

Each freight mode contributes to the region's economy in specific ways:

- **Roadways** provide access for truck freight (including long-haul trucks traveling through the region), direct service to freight-generating industries such as manufacturers and processing plants, and last-mile connections for distribution facilities, ports and rail yards, retail establishments, and home deliveries to consumers.
- **Railroads** move a variety of commodities, especially heavy bulk goods, and containerized freight moved by rail and truck. The region's railroads provide important local and regional connections to the national railroad network, serving national markets and coastal ports for international trade.
- **Waterways** (i.e., **barges**) offer less costly and higher-volume shipping options than other modes, particularly for long-distance bulk freight. A number of key industries rely on the affordability provided by water freight transportation.
- **Air freight and air express services** allow regional businesses to ship low-weight, high-value and/or time-sensitive goods to both domestic and international markets.

Trucks on Highways

Highways have been important to the development of the region's economy. Since the majority of freight in the region moves by truck, highways continue to be a critical element of the freight transportation system and the region's economic sustainability. Interstates, freeways and other roadways, including state and county highways and city arterials, support the movement of goods through the metropolitan region. These routes provide important interregional connectors, providing access to the other major economic centers of the state such as Duluth, Rochester, and St. Cloud.

Interstate 94 provides a particularly important freight link, connecting the Twin Cities region to other parts of the Upper Midwest. Figure 5-1 shows the relationship of Minnesota to the rest of the country via a map of Minnesota-connected truck flows. The heaviest truck activity is via the I-94/I-90 corridor to Chicago and between the Twin Cities and Fargo, North Dakota via I-94. The next highest truck corridor is along I-35 between Des Moines, Iowa and Duluth, Minnesota. The I-94/I-90 corridor to Chicago is of particular signifi-

cance as volumes of freight trucked via I-94/I-90 to that city's rail and air freight hubs continues to grow.

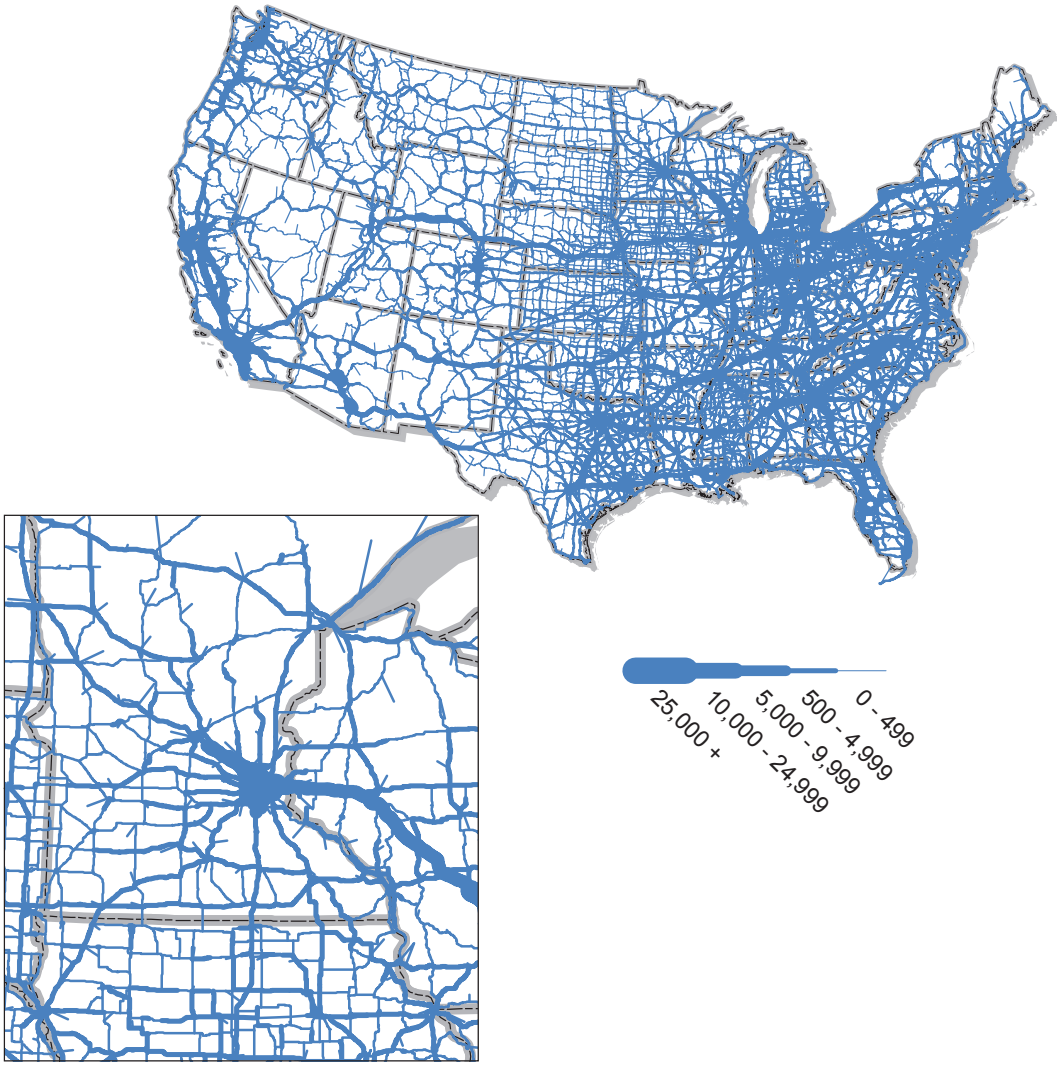


Figure 5-1: Average Daily Truck Traffic

Source: Freight Analysis Framework (FAF) 2007 data

A recent truck flows map for the region (Figure 5-1) shows that the highest volume of truck trips that begin or end in Minnesota are between the Twin Cities and Chicago.

Rail Freight System

There are four Class I railroads operating a total of more than 500 miles of track in the metropolitan region today (see Figure 5-3). These include the Burlington Northern Santa Fe Railway, Canadian National, Canadian Pacific Railway, and the Union Pacific Railroad Company. In addition, there are five short line (Class III) railroads including Minnesota Prairie Line, Progressive Rail, St. Croix Valley, Twin Cities & Western, and Minnesota Commercial Railroad. These Class III railroads collectively operate about 160 miles of track in the region and provide direct access to many local manufacturers and distributors.

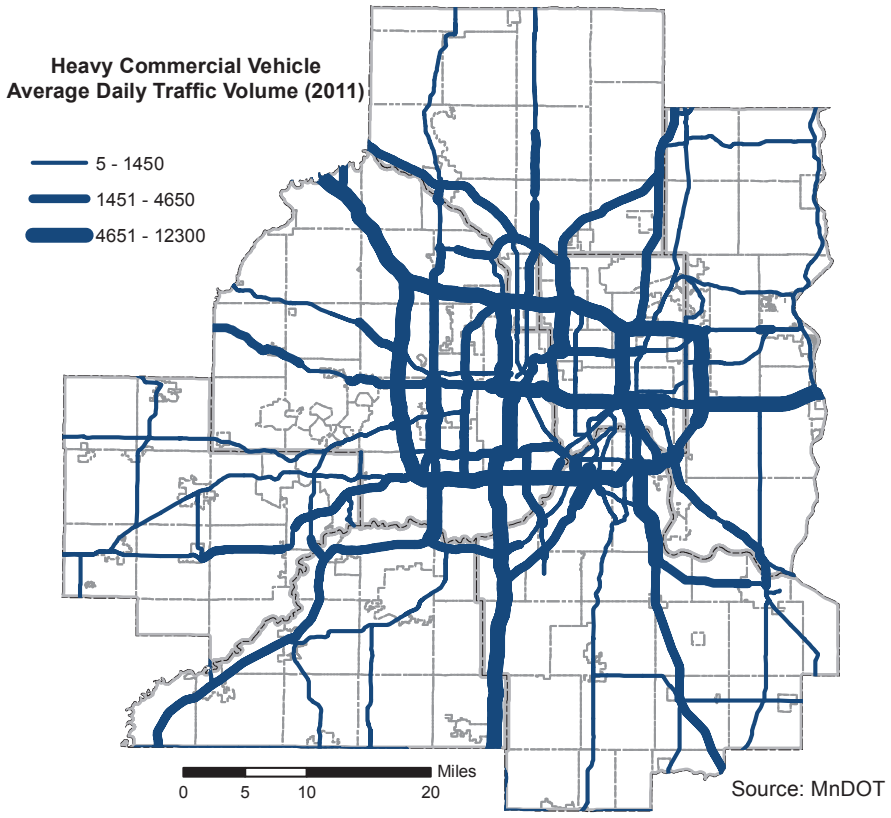


Figure 5-2: Heavy Commercial Traffic on Twin Cities' Metropolitan Highway System

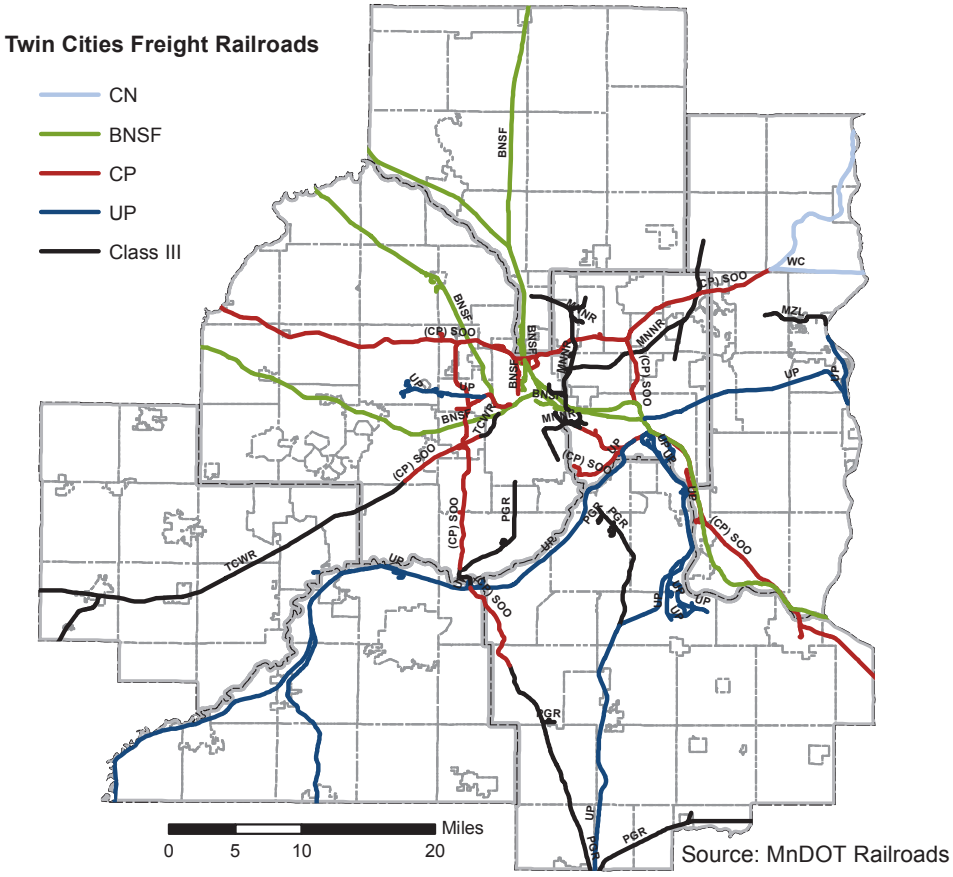


Figure 5-3: Twin Cities Freight Rail Lines

Intermodal Freight Terminals

In addition to the system of freight rail lines through the Twin Cities, two major intermodal container terminals, serving all of Minnesota and parts of western Wisconsin, are owned and operated by the BNSF and Canadian Pacific Railways. There is also a bi-modal rail terminal owned by Union Pacific Railroad and operated by Triple Crown with their unique system of "Road-Railer" containers that operate with drop-down steel wheels running directly on the rails. About 20 independently-operated truck-rail transload/warehouse centers also support the intermodal distribution of freight in the metro area. The regional rail system with major regional intermodal freight terminals is shown in Figure 5-4.

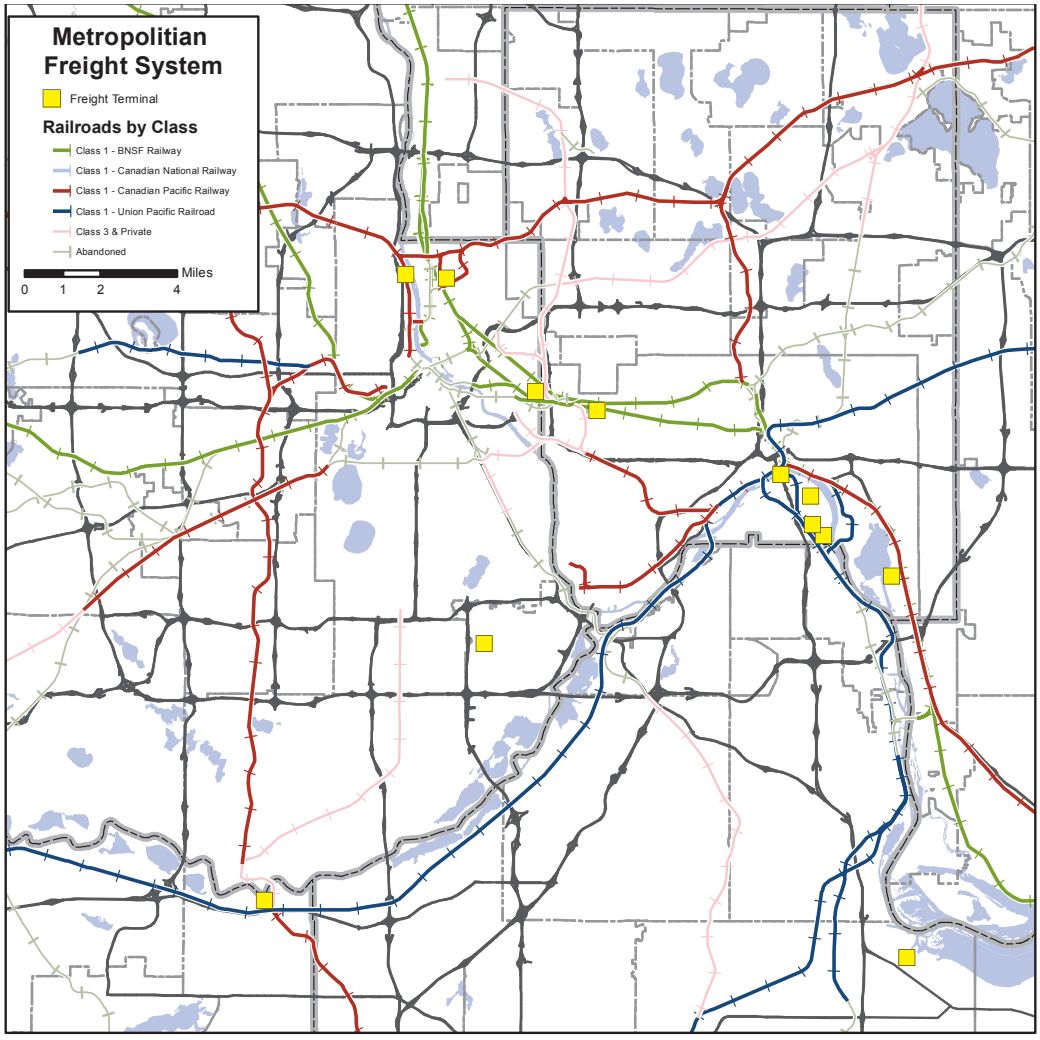


Figure 5-4: Twin Cities Railroads and Intermodal Terminals

Air Freight System

Minneapolis-St. Paul International Airport (MSP) handles the predominant volume of air freight, not only for the Twin Cities metropolitan area, but for the entire state of Minnesota and adjacent parts of Wisconsin and the Dakotas.

High-value and/or time-sensitive goods are shipped via the air freight system, especially when moving over long distances. MSP Airport became the world headquarters and a major regional hub for Northwest Airways in the 1960s. MSP remains a significant passenger hub for Delta Airlines, which merged with Northwest Airlines in 2009, with direct flights to many worldwide destina-

tions. This has made it possible for the region to continue taking advantage of "belly freight" shipping opportunities for freight carried in the baggage compartments of passenger aircraft. Freight shipped as "belly freight" represents less than 20% on average of the overall air freight volume shipped via MSP; more than 80% is shipped via air freight carriers.

Mississippi River Waterways System

Today, there are three river ports in the Twin Cities metro region, including the Ports of Minneapolis and St. Paul on the Mississippi River and the Port of Savage on the Minnesota River. Freight is hauled by barge more than 1,800 miles downriver from the Twin Cities to the Port of New Orleans where it is loaded onto oceangoing ships for export to global, oversea markets. Most recently, sand for fracture mining of natural gas has begun to be transported by barge down the Mississippi and up the Ohio River to Pennsylvania. The region's three river ports contain 32 active freight terminals which collectively handle an average of about 8.4 million tons of freight annually.

Freight System Performance Indicators

Freight Modal Distribution

About 151 million tons of freight valued at approximately $280 billion is moved annually in the Twin Cities region. In 2008, the Twin Cities region ranked 14th in the nation for the value of its exports at about $19 billion per year.

Most of the value and tonnage of the region's freight can be attributed to freight moved by truck (see Figure 5-5). On average, about 80% of freight by value and 74% by weight is carried by truck to and from the Twin Cities metro area. Trucks will carry an even greater proportion of the region's freight by 2030. Rail is predominantly the second mode of choice with about 19% of regional freight by weight and by value handled by rail carriers. Compared to trucking and rail, lower levels of freight activity are accommodated via the region's ports and MSP airport. These secondary modes, however, are critical to sustain particular industries such as agriculture and aggregate products (waterborne freight) and precision medical instruments (air freight).

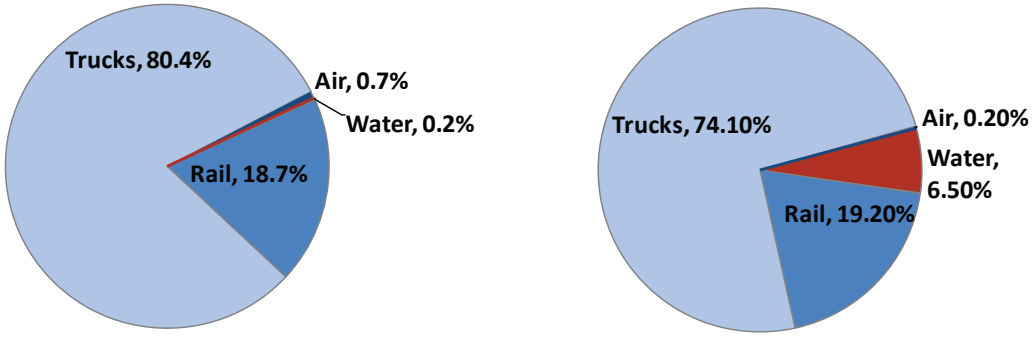


Figure 5-5: Regional Freight Modal Split by Value (left) and Tonnage (Right)

Truck Freight on Highways Indicators

Highway congestion is often cited as a current and growing obstacle to efficient trucking operations in the Twin Cities. Unlike other metropolitan regions that have large freight activity centers with concentrated truck and rail activity in relatively few urban corridors, the Twin Cities freight system has no such major centers and can be characterized as having many small- to medium-sized freight centers spread throughout the region. As a result, time delays from highway congestion may impact trucks to a similar degree as general traffic.

Figure 5-6 shows 2011 average daily congestion on metropolitan freeways based on peak period congested hours per day where estimated median freeway speeds fall below 45 miles per hour for specific freeway segments.

Based on MnDOT's Metropolitan Freeway System Congestion Report, there were 319 AM and PM miles of directional congestion on metro interstates and freeway segments of state highways in 2011. This metric is a composite measure based on peak directional congestion for the a.m. peak period (5 AM to 10 AM) and the p.m. peak period (2 PM to 7 PM). This equates to about 21% of the region's freeway miles.

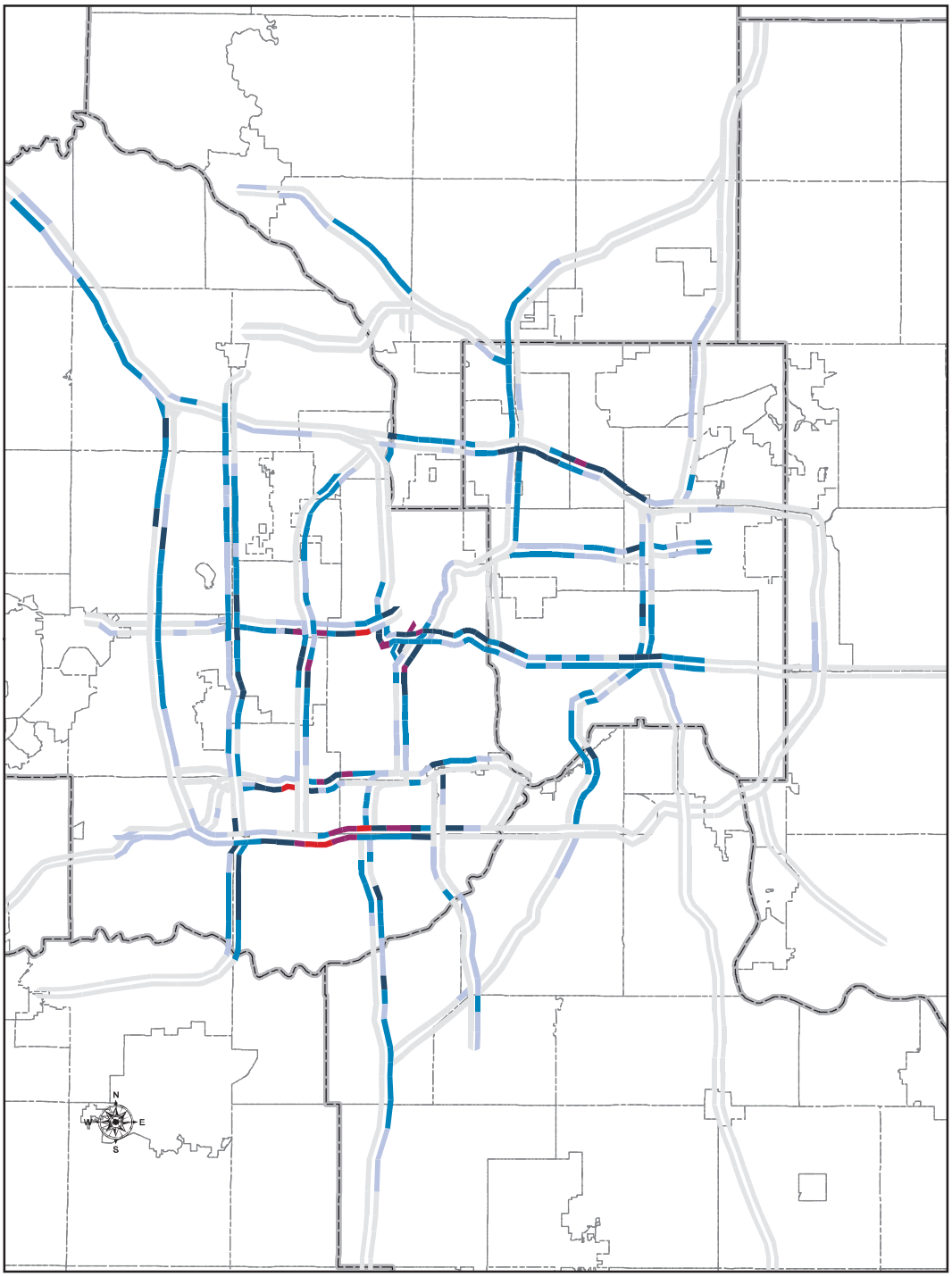


Figure 5-6: 2011 Congestion - AM and PM combined

Rail Freight System Indicators

Rail system bottlenecks

The region's freight railroads collectively moved nearly 29 million tons of freight through and within the metro area in 2007 which represents about 19% of all freight moved in the region. Congestion is also experienced on portions of the regional rail system. MnDOT's Statewide Freight and Passenger Rail Plan (adopted in 2010) identified seven major rail bottlenecks in the region including:

1. Hoffman Junction and interlocking east of downtown St. Paul
2. Coon Creek Junction/BNSF Northtown Yard
3. Minneapolis Junction & BNSF Wayzata Sub
4. St. Anthony Junction
5. St. Louis Park Interchange
6. Canadian Pacific and BNSF southeast metro river crossings
7. Savage rail bridge over Minnesota River

These rail system bottlenecks are shown by number in Figure 5-7. Many of these system bottlenecks will only become critical with the introduction of new or expanded intercity passenger rail service, including Amtrak expansion, future commuter rail (e.g., Red Rock Corridor) and/or the introduction of high-speed rail service between the Twin Cities and Chicago and/or Rochester. One existing rail congestion point that may reach a critical threshold prior to the advent of new passenger rail service is the Hoffman Junction and interlocking east of downtown St. Paul.

Hoffman Junction, the most congested bottleneck in the metro area, is where the mainline tracks of three major Class I railroads intersect, causing congestion and conflicts for the rail operators on a near daily basis. More specifically, the Union Pacific line crosses both the Canadian Pacific and Burlington Northern Santa Fe mainlines to access its Hoffman yard, thus limiting capacity for all three rail carriers. Access points to the CP and BNSF rail yards are also impacted due to the fact that as much as 5% of the nation's freight rail operations (10,000 rail cars per day) transect this junction.

To give an idea of existing rail operations and the relative importance of regional rail corridors, Figure 5-8 on page 99 shows 2007 annual tonnage by rail carrier facility for the Twin Cities metropolitan area.

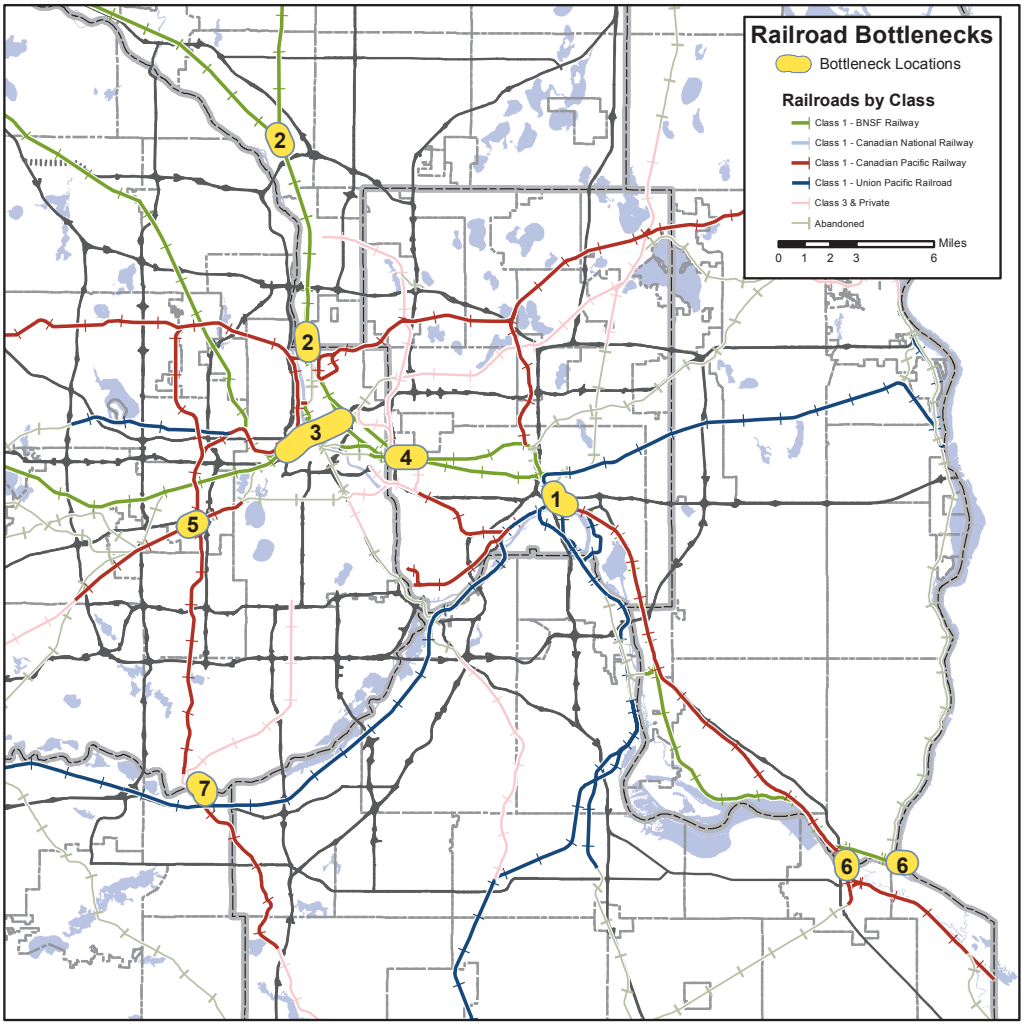


Figure 5-7: Freight Rail Bottleneck Locations

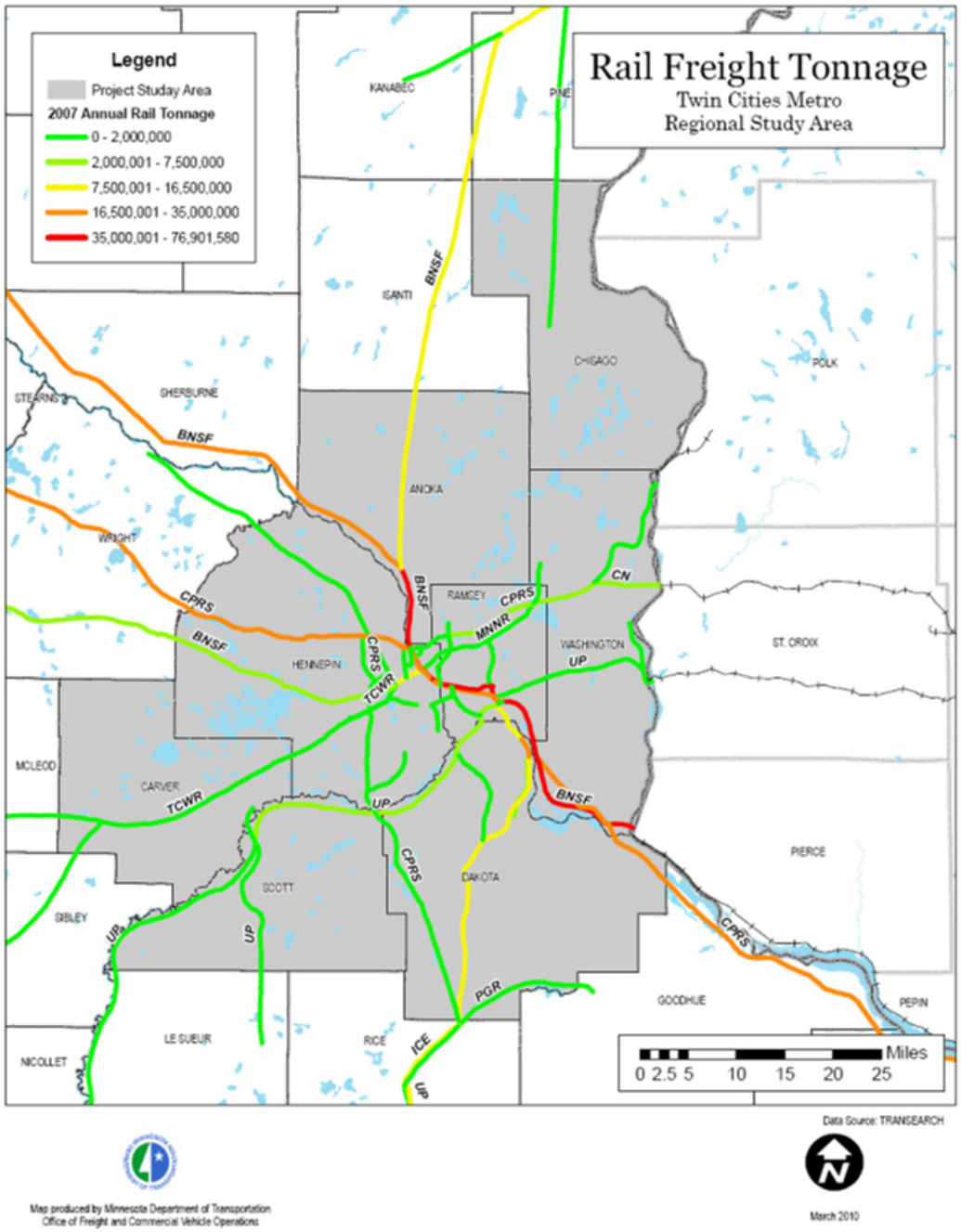


Figure 5-8: Twin Cities Annual Rail Freight Tonnage

Rail-roadway at-grade crossings

In addition to rail system bottlenecks, the status of rail-roadway at-grade crossings has implications for the efficiency and safety of the region's rail and highway systems. Table 5-1 shows rail-highway crossing data for the region. One significant finding of this analysis is that more than 36% of public rail crossings are already grade-separated in the metropolitan region. Based on observation, this is especially apparent inside the region's urbanized core (i.e., inside the I-494/I-694 ring) where more intense conflicts would exist between highway and rail users. As a result, the region has somewhat limited conflicts between rail and roadway traffic compared to other metropolitan regions and benefits from increased rail (and highway) safety and system efficiency that might otherwise be compromised. In addition more than 61% of public, non-grade separated crossings have active crossing warning devices such as gates, cantilevers, and flashing light signals.

Table 5-1: Metropolitan Rail System Crossing Data

Measure	Number	Percent
Overall track miles	606	
Public Crossings	998	
Fully grade separated	364	36.5%
Public At-Grade Crossings	634	63.5%
Active warning devices	389	61.4%
Passive warning devices	245	38.6%
Private crossings	337	
Fully grade separated	5	1.5%
Private At-Grade Crossings	332	98.5%
Active warning devices	4	1.2%
Passive warning devices	328	98.8%
Total at-grade crossings/mile	1.6	
Passive crossings/mile	0.95	

Intermodal Terminal Performance Indicators

Most of the region's intermodal container lift capacity is provided by two large intermodal yards owned and operated by the Burlington Northern Santa Fe Railway and Canadian Pacific Railroad, two of the four major Class I railroad in the Twin Cities. Collectively, the two railroads performed about 360,000 container lifts (i.e., box moves between truck and rail) in 2011 at the St. Paul and Minneapolis sites. This represents roughly 84% of the total estimated lift capacity of the two yards. Both regional facilities are located in close proximity to residential neighborhoods and constrained by physical barriers (namely highways, physical structures, or storm water ponds) on all sides. Given their central urban locations, there is also somewhat limited roadway access to both sites with limited opportunities for future rail yard expansion.

Air Freight System Performance Indicators

In 2011, MSP Airport handled about 217,000 tons of air cargo via dedicated air freight carriers and in the cargo holds of passenger airlines. The relative proportions of freight shipped via these carrier classes are shown in Figure 5-9.

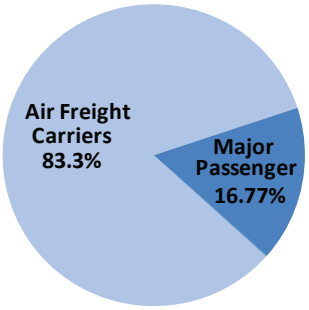


Figure 5-9: MSP Air Freight Carriers Relative Tonnage Shares- 2011

On average MSP Airport handles about 200,000 to 250,000 tons of air freight annually. This represents less than 1% of the region's total tonnage and total freight value, thus it is the smallest mode in the region in terms of weight and value. However, even though it represents only a fraction of total freight movements, air freight is still a critical component for a vital segment of the regional economy. Industries such as bio-tech and high-tech manufacturing that tend to ship high-value and time-critical components depend on a robust and efficient air freight system on a daily basis.

Waterway and Lock System Performance Indicators

- River port freight tonnage
  The region's river ports collectively moved about 7.7 million tons of freight in 2011 with the Port of St. Paul and south metro river terminals handling the vast majority of barged freight (nearly 68%) moved in the region with a total of 5.25 million tons. By comparison, the Port of Savage handled about 24% (1.8 million tons), and the Port of Minneapolis handled about 8% or 645,000 tons for the year.
- Metro waterway tonnages
  Another way of examining waterborne freight activity is by barge traffic through the Mississippi River lock and dam system. In 2011 barge activity through the region's three uppermost locks was nearly equal in terms of gross annual tonnage hauled; roughly 766,000 tons of freight were moved through each of the St. Paul and Minneapolis locks. By comparison, the Hastings lock transferred nearly three times the tonnage of the other locks combined.
- Twin Cities lock utilization
  Lock utilization rates at Twin Cities area locks ranged from 10.7% at lower St. Anthony Falls lock to 23.6% at the Hastings lock in 2011. Utilization is defined as the time the locks are conveying waterborne vessels compared to the overall time available in a day. In general, utilization rates are higher for downriver locks, with lower usage occurring with proximity to the head of navigation in Minneapolis. The one exception to this pattern occurs at the St. Anthony locks with typically higher usage rates at the Upper Falls compared to the Lower Falls. This is likely attributable to higher usage by recreational and commercial cruise boats that originate travel above the falls.

Freight Trends

Trucks on Highways

Time delays from highway congestion are likely impacting trucks to a similar degree as general traffic. Based on MnDOT's Metropolitan Freeway System Congestion Report, there were nearly 320 AM and PM miles of directional congestion on metro interstates and freeway segments of state highways in 2011. This equates to about 21% of the region's freeway miles, compared to about 18% of the freeway miles in 2002. Since 2002, the region's congestion, as defined by this metric, has been somewhat cyclical (particularly for 'severe' congestion) due to major construction projects (e.g., the I-35W Mississippi River Bridge reconstruction in 2007-2008), some freeway expansions, and to economic fluctuations such as the 2008-2009 steep recession. Figure 5-10

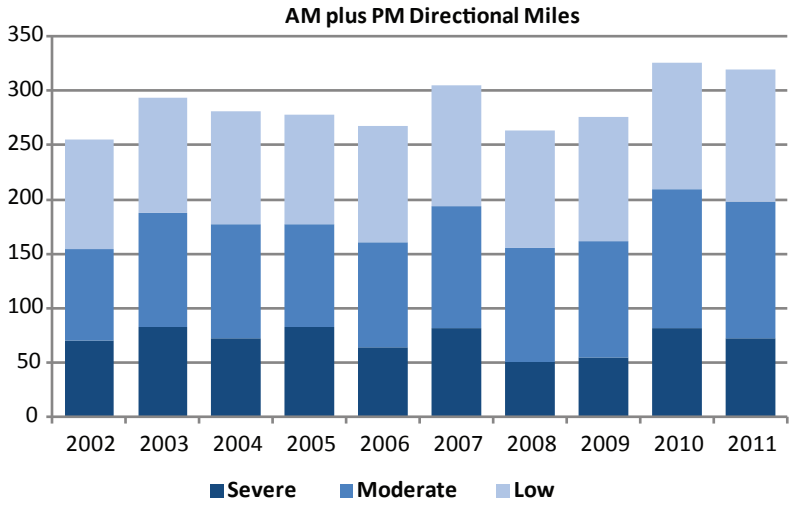


Figure 5-10: Twin Cities Metro Freeway Congestion since 2002 - AM plus PM Directional Miles

shows Twin Cities freeway congestion since 2002, which overall has grown by about 25%, or by 2.5% per year, over this time period.

A recent Twin Cities Regional Freight Study has identified the need for more comprehensive time of day vehicle classification data to more clearly define specific corridors and highway segments where trucks are most impacted by freeway congestion. Future efforts are planned to address this need for data.

Rail Freight Trends

The most significant recent trend regarding the regional freight rail system is that there is and will continue to be greater competition within established freight rail corridors between demands for freight and passenger rail service within increasingly limited capacity constraints. As an example of how these issues might play out in the region, the aforementioned Hoffman Junction congestion bottleneck was part of a larger East Metro Rail Capacity Study commissioned and led by the Ramsey County Regional Railroad Authority. The study identified a range of short and longer term improvements, including a rail-over-rail grade separation between the UP and CP/BNSF mainlines that would improve freight operations and allow for increased passenger trains to access Union Depot without delaying freight trains in the corridor. The study was done in close cooperation with the rail carriers, MnDOT, Met Council, and other government agency stakeholders.

Similar rail studies and planning will be needed in other sub-areas and corridors of the region ahead of potential expansions and additions to passenger rail service. The Statewide Freight and Passenger Rail Plan (2009) lists the following metro area corridors where new passenger rail service has been proposed.

- St. Paul Union Depot to Minneapolis Interchange via CP Merriam Park subdivision for higher speed rail service to Chicago, Red Rock commuter rail, expanded Amtrak intercity rail.
- Twin Cities to Rochester for high speed Rochester Rail Link via undefined corridor.
- Minneapolis to Duluth Northern Lights Express high speed rail via BNSF Staples (Northstar) corridor.
- Minneapolis to Cambridge intercity rail via portion of Northstar corridor and BNSF Hinckley subdivision.
- Eau Claire to Minneapolis/St. Paul intercity rail via UP Altoona subdivision and BNSF or CP corridor to Minneapolis.
- St. Paul to Hastings via Red Rock corridor for commuter rail and higher speed rail to Chicago.
- Minneapolis to St. Cloud/Fargo for enhanced conventional intercity rail via Northstar Corridor.
- St. Paul to Mankato for enhanced conventional intercity rail via UP Mankato subdivision.

As a result of the state's vision for enhanced and expanded passenger rail service in corridors shared with freight rail operations, there is a need for long-term partnering between public agencies and rail carriers to plan, fund, and implement rail system improvements that will achieve public transportation goals while maintaining private rail carriers' ability to operate existing and future freight rail service.

Intermodal Freight Trends

As noted under the freight system description, intermodal freight transfers in the Twin Cities are largely accommodated by the two major container yards

in St. Paul and Minneapolis that are owned and operated by the BNSF and CP railroads. Regional intermodal freight activity, as measured by annual container lifts between truck and rail modes at these two facilities, is shown in Figure 5-11. Total container lifts has been somewhat cyclical in the region since 2006 and the data reflect the economic pressures of the nationwide recession in 2009 to 2010, with steadily increasing volumes over the last two years. In fact, intermodal activity is projected to reach and just surpass the previous pre-recession peak of 2008 in 2012.

Also shown in Figure 5-11 is the relationship between intermodal lifts and estimated yard capacity at the two main rail yards. The collective utilization rate at the yards varied between about 70% and 88% over the last six years with 2012 estimated to top out near 88% of capacity. As the intermodal rail industry continues to grow at a projected rate of 4% per year, the remaining lift capacity at the major yards could be expected to be used up within the next five years. Before that time arrives, the railroads may look to develop new and more modernized intermodal facilities outside the region's urban core cities.

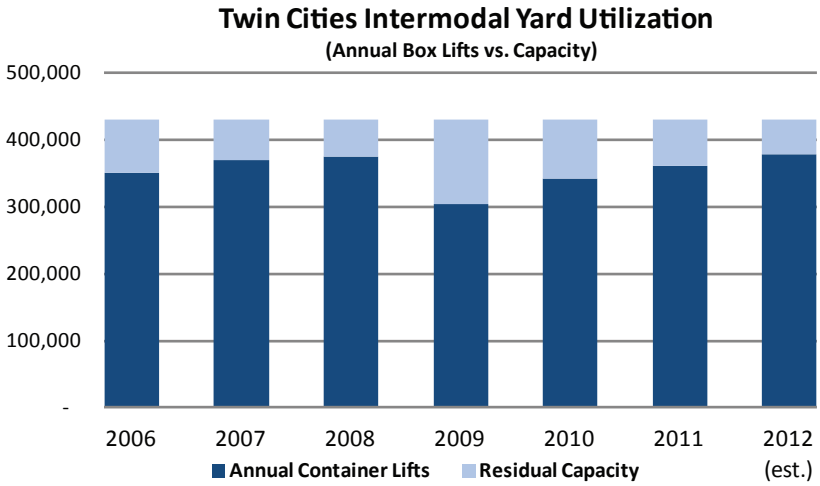


Figure 5-11: Twin Cities Rail Intermodal Yard Utilization

Air Freight Trends

The region's level of air freight shipped through MSP Airport has declined since 2006 as shown in Figure 5-12. The declining shipments correspond to the onset of the economic recession in 2008, followed by a low point in 2009 and modest recovery in 2010 and 2011. A portion of this decline can also be attributed to one of the major air freight carriers (DHL) eliminating international service at MSP in 2009. Related to this action, there has also been an increasing amount of freight exports designated for air transport that leaves the region via truck bound for Chicago O'Hare Airport. This practice has experienced a continual trend because it allows shippers to take advantage of larger shipping blocks, better access to international markets, and lower average transportation costs. Since 2006, air freight through the region via MSP has decreased about 15.4%, or by an average of more than 3% per year.

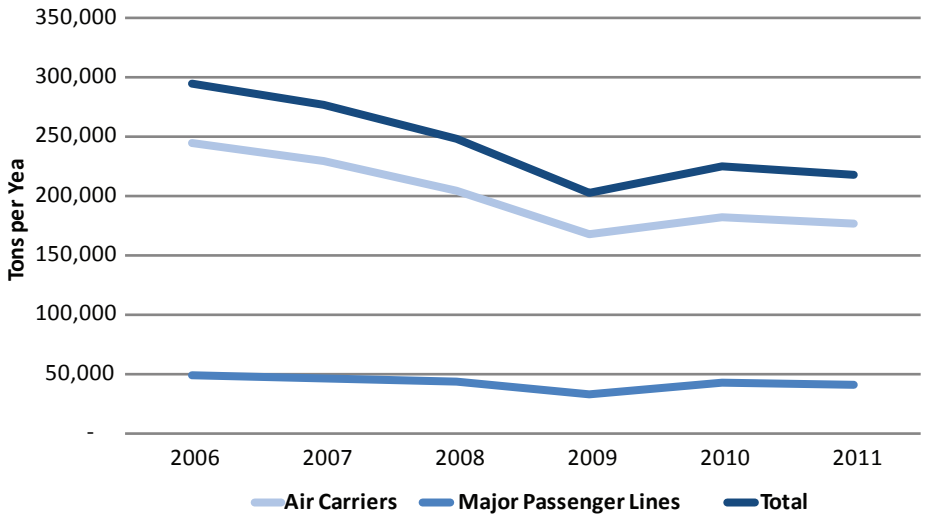


Figure 5-12: Twin Cities Air Freight Throughput Trend

Table 5-2: Air Freight through MSP Airport (Tons per Year)

	2006	2007	2008	2009	2010	2011
Air Carriers	244,803	229,235	204,055	167,821	181,931	176,362
Major Passenger Lines	48,560	46,177	43,108	33,110	42,349	40,785
Total	**293,363**	**275,412**	**247,163**	**200,931**	**224,280**	**217,147**

Waterborne Freight Trends

River port freight tonnage

As shown in Figure 5-13, Twin Cities area river port freight volumes have decreased from just over 9.5 million tons in 2005 to about 7.8 million tons in 2011, or a downturn of about 18.6%. This is due, in part, to the overall economic crisis in 2007 – 2009, but also to some modal diversions to rail and truck. Since the low point in 2008, the region's overall barge tonnage increased nearly 30% to roughly 80% of the peak of 9.8 million tons barged in 2006.

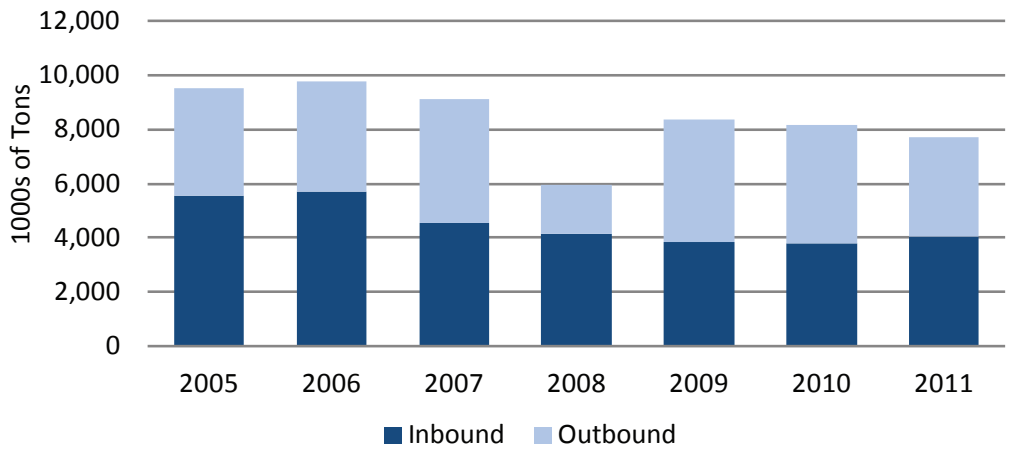


Figure 5-13: Twin Cities Metro River Port Freight Tonnages, 2005 - 2011

Since 2005, inbound freight barged to Twin Cities river ports decreased at a greater rate (-28%) than outbound freight which decreased 5.4% during this period as shown in Figure 5-14. Outbound freight activity has been much more volatile than inbound freight during this time, and was severely impacted by the economic recession in 2008. Outbound flows destined to foreign markets via New Orleans also tend to be more volatile as they are sensitive to global economic and corresponding grain trade fluctuations. Since the low point for 2008, outbound waterborne tonnage rebounded dramatically in 2009 as it increased by more than 2.5 times to a peak of nearly 4.6 million tons. This was followed by a moderate decline of nearly 19% from 2009 to 2011. During this same four-year period, inbound barged tonnages stabilized and showed a moderate increase of about 5% since 2009.

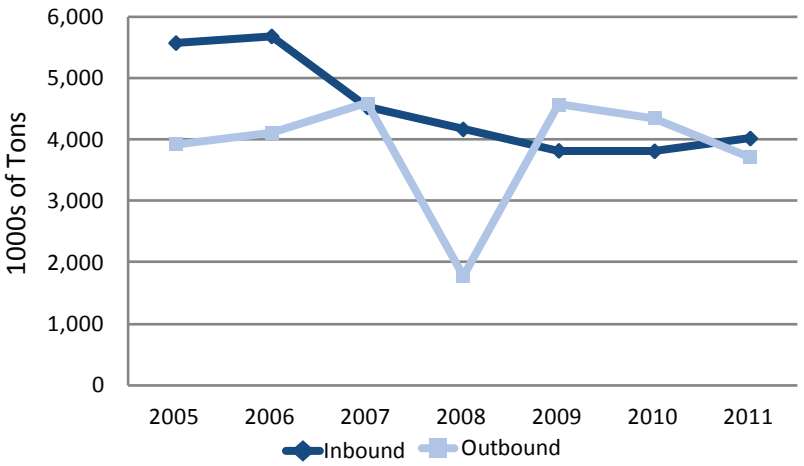


Figure 5-14: Twin Cities Inbound vs. Outbound River Port Freight, 2005 - 2011

Metro lock system tonnages

The relative barge freight activity through the Mississippi River lock system in the Twin Cities has been changing, especially since 2008. Although Hastings Lock and Dam number 2 has always carried the most barge freight in the region, Figure 5-15 shows that statistic is becoming even more pronounced. In 2006, Hastings carried about 66% of total regional barge traffic by tonnage, but by 2011 that proportion has grown to about 75%. This trend is reflective of declining barge traffic above the Ford Dam in St. Paul (including the gradual contraction of throughput at the Port of Minneapolis considered for possible closure) coupled with a stabilizing level of barge activity at Hastings since the economic low point in 2008.

Twin Cities lock utilization

One way of analyzing river lock system capacity is through examining Corps of Engineers annual lock utilization data. As shown in Figure 5-16, lock utilization (as a percentage of overall time the lock is occupied) has been steadily declining between 2005 and 2011. Average lock utilization decreased from about 19% to about 15.7% during this time. The Hastings lock and dam system experienced the greatest decline from about 33% to 24%, while the Upper St. Anthony Falls lock actually increased slightly in lock utilization, most likely due to an increase in recreational and commercial cruise boat activity. Today, none of the Twin Cities lock systems is operating near capacity; however, there are some delays reported at the Hastings lock (8 minutes, on average) that have been increasing slightly over time. This is most likely due to barge configurations too large to negotiate the lock that require breaking down into multiple units prior to transiting the lock.

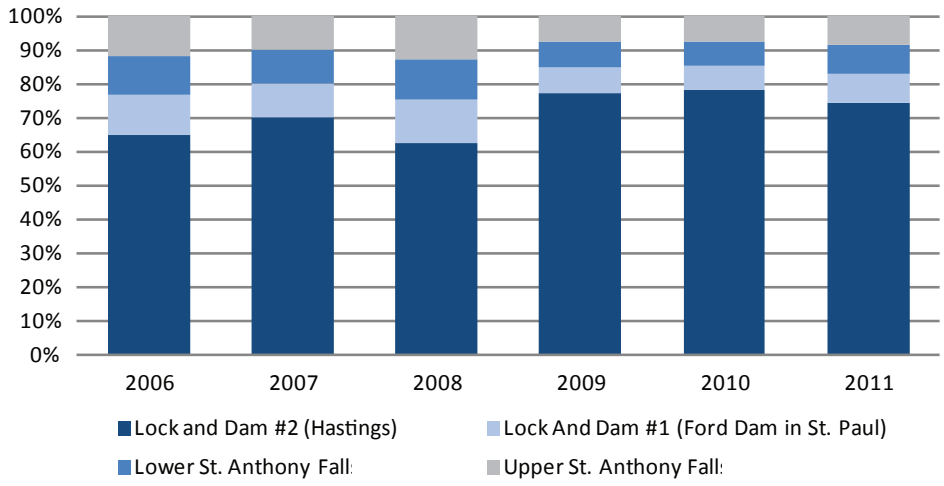


Figure 5-15: Twin Cities Proportional Lock System Tonnages, 2006 - 2011

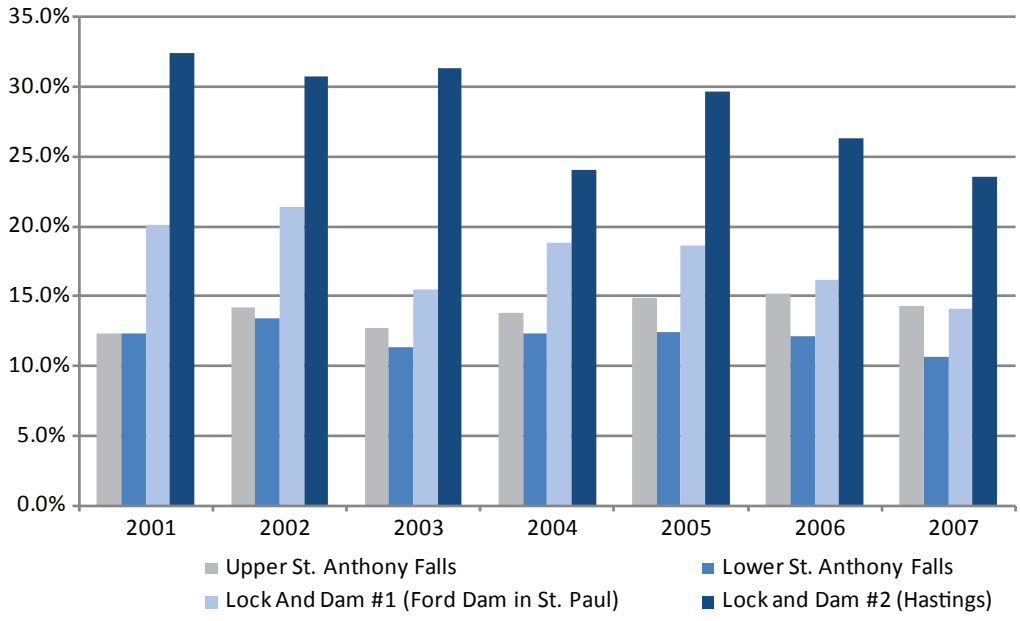


Figure 5-16: Mississippi River Locks Utilization

Chapter 6: Bicycle and Pedestrian Evaluation

System Characteristics / Description

The Minneapolis-St. Paul region is fortunate to have such a well-developed network for bicycling. The culture of the Twin Cities has embraced bicycling to a larger degree than similar cities in North America, and the state and the region have made investment decisions that reflect a relatively strong level of support for this culture of bicycling.

The hallmark of the bicycle network of this region is the extensive off-road trail system that connects regional parks and traverses the major waterways and abandoned rail corridors. The support for the continuing development of this impressive system, much of it coordinated by the Metropolitan Council's parks division, is the result of the strong legacy of parks and trails that began more than 100 years ago with the founding of the Minneapolis Park and Recreation Board. The most visited regional parks in the Twin Cities region are those that make up the Grand Rounds in Minneapolis including Minnehaha Creek and Falls, and the Chain of Lakes. These parks are unique in that they are primarily linear and connected by bicycle and walking paths. These first parks were built at the beginning of the 20th century and the bicycle paths that connect them still remain some of the most used in the region and were first paved for bicycling in the 1970s. The region embarked on the development of the regional trail system in the 1980s and 1990s while new suburban communities built local trail systems as they grew. Since the beginning of the 2000s, the region has continued to build out the trail system and rebuild some of the older trails, such as those in the Minneapolis parks system.

Recent Changes

The most significant change recently, however, has been an aggressive expansion of the on-road bicycle transportation system. As the trail system has been expanded, the region has run out of many of the opportunities, such as abandoned rail corridors, that made the off-road trail system possible. The city of Minneapolis leads the region in the effort to retrofit its streets for safer bicycling as it has few places left to build off-road trails and has the most active bicycling culture with bicycle mode share exceeding 10% in some neighborhoods. Other cities such as St. Paul, Bloomington, Richfield, Edina and others are similarly approaching street design with an eye toward "complete streets" approaches to scoping projects. Indeed, MnDOT, Hennepin County and several cities in the region have adopted Complete Streets policies which require that bicycle travel be explicitly considered when scoping transportation projects. This new emphasis on roadway design is accompanied by an increase in the use of bicycles for transportation by residents and visitors in the region. While the region has made several important strides for safe and comfortable bicycle travel, there are many important destinations that lack safe passages for bicycling as well as many bicycling routes with unsafe and uncomfortable sections or barriers. If the region is to become a first-class place for bicycling, these deficiencies must be corrected.

Taking a look at the bikeway network today, a clear pattern emerges with fairly well-connected bicycle trails in the newer suburban communities that developed since the 1980s, several important regional trails that connect regional parks as well as destinations in the core (Midtown Greenway, Cedar Lake Trail, Luce Line Trail, Mississippi River Trail, etc.) and an expanding network of on-road facilities in Minneapolis and St. Paul. The first suburbs, those settled between 1950 and 1980, are the least bicycle-friendly areas

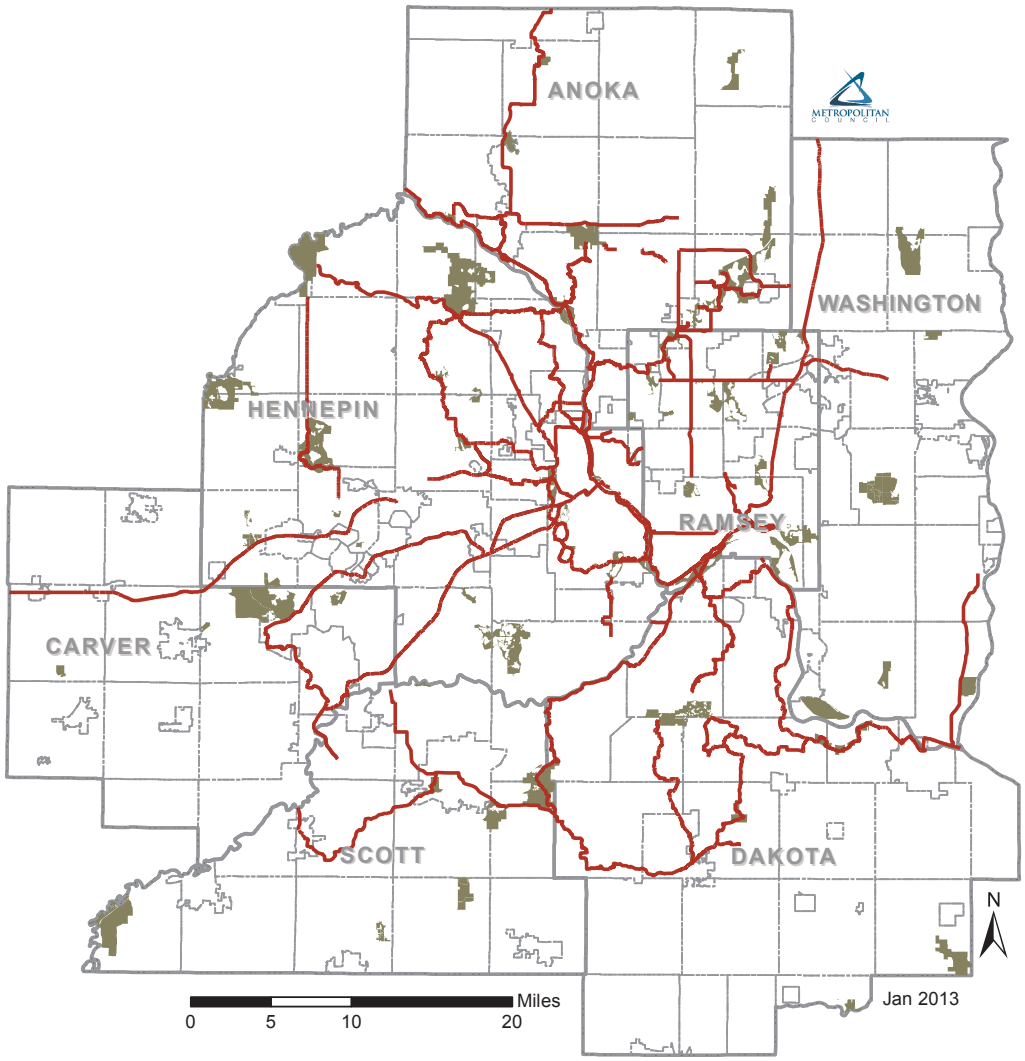


Figure 6-1: Regional Trails and Park System

because trails were not built when they were developed and their streets were designed with little consideration for bicycling or walking. There are also several barriers to bicycle travel such as major roadways and interstate highways, and active rail corridors.

Bikeway Characteristics

Bikeways take on several characteristics in the region. There are limited access off-road paved trails that run in their own unique right-of-way. Many of these trails are part of the regional trail system. These trails often follow abandoned railroad corridors or run alongside active rail lines. Others, like the Mississippi River Trail (MRT) exist within parkland. The region also has many off-road trails that run alongside highways. These trails typically follow the road and share intersections with it but many bicycle routes include segments of trail that follow a road and segments that are limited access and follow their own rights-of-way. On-road bicycle facilities come in many forms in the region. There are collector and arterial roads with bike lanes, roads with advisory bike lanes, roads with shared road markings (“sharrows”), and bicycle boulevards, as well as many designated bike routes that have either striped shoulders or are low-volume but have no pavement markings. Individuals who use their bicycle for transportation will find themselves on routes that include all of these types of bikeway.

Currently, Minneapolis is exploring new innovative bicycle treatments including cycle tracks, which is a striped bicycle lane with added protection from vehicle traffic, usually provided by a parking lane.

Bikeways Development

The Metropolitan Council plays a limited, yet influential role in the development of the regional bikeway system. The Council does not own or manage any bicycle facilities but Council policies influence their development through its coordinating role as the manager of the regional parks system, and in its role, together with the Transportation Advisory Board (TAB), as the Metropolitan Planning Organization (MPO) responsible for long-range transportation planning and programming of federal transportation funds. The regional trail system is primarily a recreational system, although there are several links within it that likely play an important role in transportation. The funding and investment priorities for that system are allocated by the state and the region and determined through a collaborative process with the 11 regional parks partner agencies under the guidelines of the Regional Parks Policy Plan.

Regional trails are also eligible to receive federal transportation funding, but that source of funding is managed through an entirely separate process that follows the guidelines described in the Transportation Policy Plan. The priorities for transportation are distinct from parks in that any facility for bicycle travel is eligible for funding, but the priorities for investment are primarily geared toward removing barriers to bicycle travel and improve safety. Transportation funding for bicycle projects is intended to be for transportation purposes and not for recreation, but the region lacks a comprehensive understanding of bicycle network as a transportation system. The Metropolitan Council will be engaged in a Regional Bicycle System Master Study in 2013 that will help achieve a better understanding of this transportation system and use this improved understanding to more proactively guide the system's development in the next update to the Transportation Policy Plan, which will be revised in 2014.

The Minneapolis area was one of four locations selected in 2005 as part of the national federally-funded Nonmotorized Transportation Pilot Program, which was designed to demonstrate how bicycling and walking could be a significant part of the transportation system with increased investment in planning, infrastructure, and education. The pilot area included the City of Minneapolis and 13 surrounding cities, including portions of the cities of St. Paul, Fridley, Columbia Heights, St. Anthony, Lauderdale, Falcon Heights, Roseville, Richfield, Edina, St. Louis Park, Golden Valley, Robbinsdale, and Brooklyn Center. The surrounding cities were included to address connections between those communities and Minneapolis.

The Metropolitan Council participated with Bike Walk Twin Cities (the local program for the national pilot) on a 2009 study of bicycle and pedestrian connections to transit. The study looked at existing conditions in transit corridors and identified infrastructure improvements that could improve nonmotorized connections to transit service.

Bicycle Network Statistics

An inventory of the bicycle network, based on 2007 data, was done in the summer / fall of 2012, and will be verified in 2013 with corporation from local government partners.

Preliminary Inventory Results:

- 2,650 miles of bikeways (aggregated)
- 975 miles of on-road bikeways (bike lanes, sharrows, striped shoulder/ marked bike routes)
- 1,600 miles of trails

Local bicycle and pedestrian planning statistics:

Of 182 communities:

- 41 communities address trail access to all neighborhoods of their communities
- 19 have separate trail master plans
- 24 communities address bicycle and pedestrian safety on roadways with traffic calming techniques and policies in the transportation element of their comprehensive plans

System Performance

As in most of the country, the region lacks the kind of robust data on use of the system that exist for other modes of transportation, but work is planned to address these gaps.

In 2012, the Metropolitan Council completed an evaluation of the region's "A" Minor Arterial system. One of the study's recommendations is to collect data on "A" Minor Arterial transit, bicycle and pedestrian use and investments to assist with understanding how these facilities support bicycles and pedestrians as part of the regional transportation system. The study recommended that this data include locations of sidewalks, trails, and bus stops, and ADA compliance for bus stops.

In 2013, the Metropolitan Council will conduct a Regional Bicycle System Master Study. This study will include recommendations for performance measurement to be conducted on a regular basis once the study is concluded to measure various types of statistics for bicycle travel in the region. These statistics will likely include bicycle counts, pavement condition reports, winter maintenance coverage (high importance routes should be plowed quickly in winter), crash/safety statistics, and system mileage.

MnDOT funded a study on developing a bicycle and pedestrian counting methodology. Part of this is to gather information about what count data is being collected throughout the region. This work is underway at the moment and will be occurring at the same time as the development of this report.

FHWA is updating its Traffic Monitoring Guide to include guidance for counting bikes and pedestrians, the new Travel Monitoring System will incorporate this data beginning in early 2013.

These two efforts will give us guidance on conducting additional counts throughout the region in addition to what is already underway.

In addition, the Regional Bicycle System Master Study will include a complete inventory of the regional bicycle system for transportation and a classification of major bicycling transportation routes.

Metropolitan Council Parks conducts counts on the regional trail system that are used for use estimates on the trail system. In 2011, over 11 million people

visited the regional trails, which are all eligible to receive Metropolitan Council parks funds. These trails only represent a portion of the total bicycle and pedestrian system. This trail use represents a growth of 13% over trail use in 2010. The regional trails in the city of Minneapolis receive more than half of all regional trail visits. More than 6% of visits to the recreational trail system are from individuals who live outside of the region.

Trends / Analysis

Mode Share

Bicycling and walking have increased across the seven-county region. The 2010 Travel Behavior Inventory (TBI) conducted by the Metropolitan Council is the seventh in a series of studies done every 10 years by the Council to discover where, when, why and how people travel in the region. According to preliminary data from the 2010 TBI, 7% of all trips made within the seven-county region are done by walking, and 2% of all trips are made by bicycle. Between 2000 and 2010, the share of walking trips with in the region increased 0.4 percentage points and the share of bicycling trips in the region increased by 0.5 percentage points.

The 2010 data also show that residents in the central cities make more of their trips by walking and bicycling when compared to the seven-county region. Walking rates more than double in the central cities, where 14% of all trips are made on foot. Bicycling trips also double compared to the central cities and the overall region; 4% of trips in the central cities are made on bicycles, compared to less than 2% regionally.

The TBI is important because the surveys capture all trips; most other readily available mode share data is from the Census Bureau's work commute data, but commute trips are a small proportion of all trips that people regularly make.

For commutes, the Census Bureau's American Community Survey from 2011 for the larger 13-county MSA estimates that 0.8% of commuters bicycle and 2.2% walk to work. Among large metropolitan areas, this puts the Twin Cities tied with Boston, MA at 12th in bicycle commuting.

Within the region, the Council's 2010 Travel Behavior Inventory showed that commute to work trips only account for 23% of all travel in the region, and more trips are made by walking and bicycling when all trips are accounted for, as noted above.

Minneapolis leads the region by far in the bicycle commute mode share. The American Community Survey estimates that 3.5% of commuters used a bicycle to commute to work in 2011. This puts Minneapolis at #22 among all cities in the bicycle commute mode share and virtually tied with San Francisco at #3 among cities with a population of over 250,000 (after Portland, OR and Seattle, WA).

Safety

Pedestrians and bicyclists are the most vulnerable users on the road. An analysis of traffic crash data from MnDOT for a three-year period from 2009 through 2011 reveals that the seven-county Twin Cities region has an average of 22 pedestrian deaths and 4 bicyclist deaths from traffic crashes each year. In the same period, pedestrians bear an average of 616 injuries a year and bicyclists suffer an average of 697 injuries. Comparing the data to the entire state reveals that while a little over 58% of all of the traffic crashes in the state happen in the Twin Cities region, only 28% of the overall traffic fatalities occur here.

However, the region's share of these crashes looks much different for pedestrians and bicyclists because of its more urbanized area compared to other parts of the state. Although the region on average has 28% of the overall traffic fatalities within the state, we have over 56% of the pedestrian fatalities and half of the bicyclist fatalities. While walking trips are 6 % of all trips made within the region, pedestrian fatalities are a disproportionately larger percentage of the region's traffic deaths; almost 20% of all traffic fatalities in the Twin Cities region are pedestrians. The numbers are not as disproportionate for bicyclists in the region, but they still make up 3.6% of all Twin Cities traffic fatalities, compared to making 2% of all trips. Additional future analysis of MnDOT crash data for pedestrians and bicyclists in the region would provide more information about the nature of these crashes and safety issues.

Volumes

As part of the federal Nonmotorized Transportation Pilot Program, Bike Walk Twin Cities has been collecting counts of people walking and bicycling in Minneapolis and St. Paul since 2007 using a nonmotorized methodology in partnership with the USDOT. According to the Bike Walk Twin Cities 2011 Count Report, in the past five years since 2007, bicycling has increased by 52%, and walking has increased by 18%.

The Minneapolis Public Works Department has also collected detailed data on bicycling in the city. According to its data, bicycling in the city increased 47% between 2007 and 2011.

In 2012, the Council began collecting bicycle origin-destination and route data using CycleTracks, a smartphone application developed by the San Francisco County Transportation Authority (SFCTA). CycleTracks allows cyclists to voluntarily share data on trip routes, times, speeds, and trip purpose. The data is currently being used to understand route behavior of different types of cyclists, and will eventually be used in modeling and scenario analysis.

Increases in the number of people walking and bicycling can help improve safety by creating more visibility and driver awareness. Research has shown that as more people bike and walk, crash rates tend to decline.

Chapter 7: Aviation System

Characteristics of the Aviation System

The seven-county metropolitan region has eleven airports, one commercial airport and 10 general aviation airports, that provide aviation services to the region. Most of these facilities are owned and operated by the Metropolitan Airports Commission (MAC), although Forest Lake and South St. Paul are city owned. The airports in the Twin Cities Regional Aviation System have roles assigned by various classification systems (Regional, State and Federal), each tailored to the specific needs of the particular system. The airport and airspace interaction within the regional system and its relationships to the state and national systems is somewhat like a chess board in that what changes at one facility can have ramifications in terms of user behavior, business decisions, airport management actions, and government policy decisions for any number of other facilities in the system. Table 7-1 shows the system airports and the respective classifications in the national, state and regional systems. These airports are classified according to their system role as a Major, Intermediate, Minor or Special Purpose facility. (see Figure 7-1).

Table 7-1: System Airports by National, State, and Regional system

Airport Name	National Plan of Integrated Airports System (NPIAS) Status	MN State Aviation Plan System Classification	Met Council Regional System Plan
Minneapolis-St. Paul International Airport	Commercial Service Primary	Key	Major
St. Paul Downtown	Reliever	Key	Intermediate
Airlake	Reliever	Intermediate	Minor
Anoka County/Blaine	Reliever	Intermediate	Minor
Crystal	Reliever	Intermediate	Minor
Flying Cloud	Reliever	Key	Minor
Lake Elmo	Reliever	Intermediate	Minor
Forest Lake	NPIAS submittal	Landing Strip	Special Purpose
South St. Paul	Reliever	Intermediate	Minor
Surfside (Seaplane Base)	Not in NPIAS	Landing Strip	Special Purpose
Wipline (Seaplane Base)	Not in NPIAS	Landing Strip	Special Purpose

Table 7-2 on the next page shows the airfield characteristics of the regional system airports.

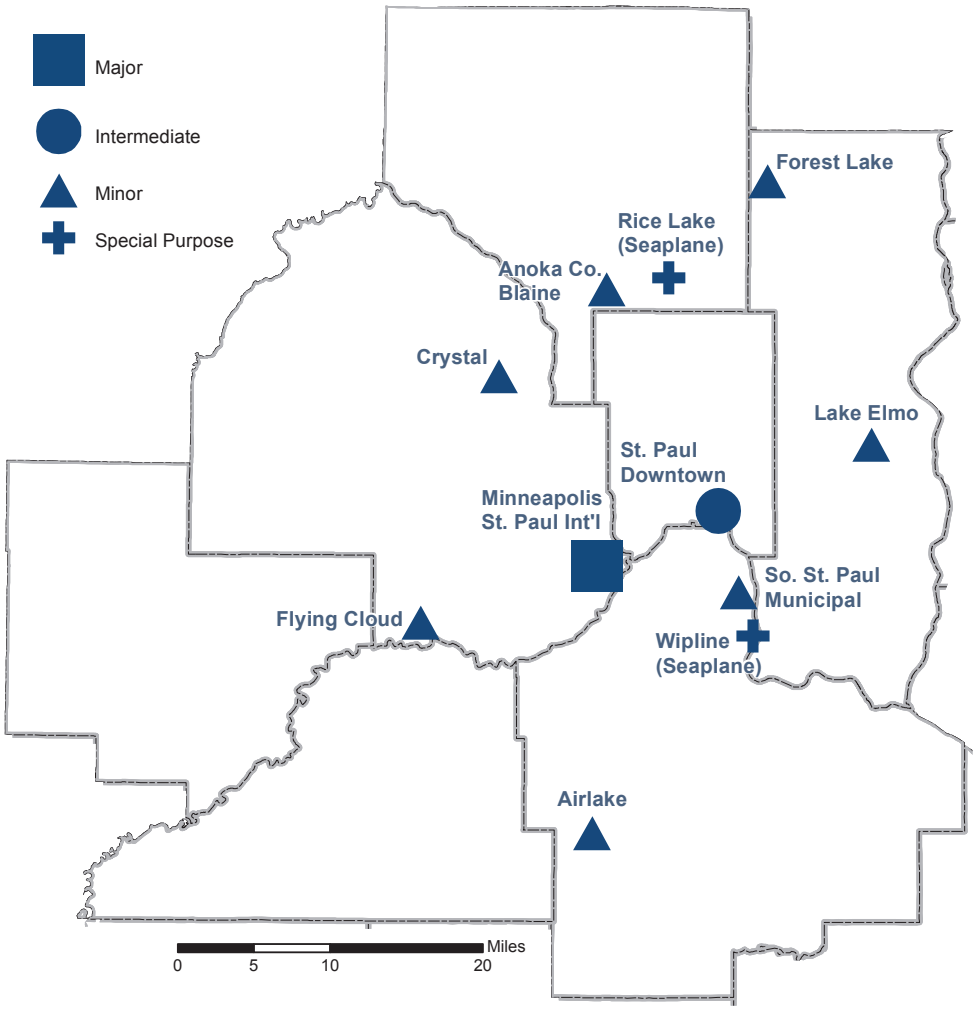


Figure 7-1: Regional Airports by System Role

Table 7-2: Twin Cities Metropolitan Airport System Characteristics

Airport Name	Number of Runways	Longest Runway in Feet	Paved	Tower coverage
Minneapolis-St. Paul International Airport	4	11,006	Y	24 hrs
St. Paul Downtown	3	6,491	Y	P
Airlake	1	4,098	Y	-
Anoka County/Blaine	2	5,000	Y	P
Crystal	3	3,266	Y	P
Flying Cloud	2	5,000	Y	P
Lake Elmo	2	2,850	Y	-
Forest Lake	1	2,650	N	-
South St. Paul	1	4,001	Y	-
Surfside (Seaplane Base)	2	5,500	NA	-
Wipline (Seaplane Base)	1	8,000	NA	-

Tower: 24 = 24 hour control tower operations; P = Less than 24 hour control tower operations, - = no control tower

The nine Minnesota county commute-shed is served by an additional 13 airports as listed in Table 7-3. Of these airports only St. Cloud is served by a control tower for part of the day. The rest are uncontrolled airports.

Table 7-3: Commute-Shed Airports

County	Airport Name	Number of Runways	Longest Runway in Feet	Paved
Chisago	Rush City Regional	1	4,397	Y
Isanti	Cambridge Municipal	1	4,001	Y
Sherburne	St. Cloud Regional	2	7,000	Y
Sherburne	Princeton Municipal	1	3,900	Y
Sherburne	Leaders Clear Lake	1	3,020	N
Wright	Maple Lake	1	2,790	Y
Wright	Buffalo	1	3,200	Y
McLeod	Hutchinson Municipal – Butler Field	1	4,000	Y
McLeod	Glencoe Municipal – Vernon Perschau Field	1	3,299	Y
Sibley	A. R. S. Sport Strip	1	2,505	N
Le Sueur	Le Sueur Municipal	1	3,000	Y
Rice	Faribault Municipal	1	4,.257	Y
Goodhue, WI	Red Wing Regional	1	5,010	Y

System Performance Evaluation

An integral part of system planning is the periodic review of the roles each airport serves in the system. There are many aspects to system planning and performance evaluation. First, the roles of an airport need to be identified within the system. Then the airport's performance can be evaluated in terms of facility and services that the airport provides in relation to the system. Furthermore, the airport facilities and services can be benchmarked against a set of defined facility and service criteria. The airports in the Twin Cities Regional Aviation System have roles assigned by various (federal, state and metro) classification systems, each tailored to the specific needs of the particular system. For each airport role, a set of facility and service objectives were developed, based upon the types of aviation users the airport predominantly serves. These recommended objectives covered the following airside facilities, landside facilities and services. These objectives can be found in the Regional Aviation System Plan prepared in 2009. Using the recommended objectives identified in the Regional Aviation System Plan, each airport is evaluated based on the role assigned to it under the classification system.

The five airport role classifications are: Major, Intermediate, Minor II, Minor I, and Special Purpose. These functional roles within the regional airport system also provide a baseline for evaluating the performance of the Twin Cities' existing airport system. It should be noted that the Twin Cities regional airport system is a well-developed aviation system that has been properly managed and maintained. As a result, the airports within the system already meet most of the recommended facility and performance measures, and that future

changes or developments at these airports would only result from a change in aviation demand.

This evaluation provides the foundation for subsequent recommendations for the Twin Cities Regional Aviation System, as well as for individual study airports. In addition to improvements at individual airports, the issue of which airports should be included in the National Plan of Integrated Airports Systems (NPIAS) should be addressed, as this can be an important factor in funding for airport improvements.

Each airport has mechanisms in place that provide for long-term planning of the airport facilities, use, and airspace. Minnesota state law requires an update of long-term community, county and special district plans every 10 years; the last updates occurred in 2008 and 2009 for most of the system airports.

There are three metropolitan region airports that are not part of the NPIAS – Forest Lake, Surfside Sea Plane Base, and Wipline Sea Plane Base – would need a benefit-cost analysis to substantiate their addition to the NPIAS. The facility and service objective evaluation found few shortfalls in the system– consistent with a mature and well-developed airport system.

Only a few proposed facility and service objectives were not met, and these were generally not items of major significance. The system's *Major Airport*, Minneapolis-St. Paul International, meets all of its proposed measures.

The system's *Intermediate Airport*, St. Paul Downtown, meets 94% of its proposed measure. The only proposed measure it failed to meet was the food service objective because of the lack of an airport restaurant.

The *Minor II Airports* in the system meet 100% of their proposed measures.

The *Minor I Airports* meet 97% of their proposed measures. Crystal Airport meets all of its proposed measures. Lake Elmo fails to meet only one of its proposed measures, ground transportation, by lacking courtesy car service. South St. Paul Airport falls short of a single proposed measure. It does not meet the approach lighting system measure, since it does not have any approach lights or runway end identifier lights.

Collectively, the *Minor Airports* meet nearly all of the proposed facility and service measures. The *Special Purpose Airports* meet 100% of their proposed measures.

In terms of planning and zoning, all of the airports have or are developing long-term plans. Many have joint zoning boards and associated zoning regulations in place. Those that don't have plans in place to establish joint zoning boards and regulations no later than 2012.

Overall, the system airports meet 98% of their proposed measures. This illustrates that the Twin Cities Regional Aviation System is a mature, well developed airport system made up of airports that do not lack in any significant development areas for the proposed roles they have been assigned. Those few areas where shortfalls have been identified will be addressed in the future, and Council staff will detail recommended improvements to the aviation system.

Pavement Conditions

Pavement conditions can be used as another performance measurement with regard to the health of the aviation system. Airport runway and taxiway pavement at the metropolitan airports is in Good Condition, according to MnDOT.

Minnesota airports met the target for good pavement with 82.9% of airports receiving a pavement of good condition in 2010.

Ground Travel and Airport Service Area Evaluation

The provision of convenient access to the region's airports is an important goal for the Metropolitan Council Regional Airport System. Accessibility to an airport can be defined in terms of access both from the ground and from the air, effectively defining its service area. The Federal Aviation Administration, through NPIAS has established guidelines to evaluate the accessibility of airports by ground. These measures will help to identify the percentage of the region's population and land area that is within a typical drive time of each category of airport.

The support in the development of an airport system that serves the largest possible number of citizens and businesses is an important goal. The primary benchmark by which airport accessibility is measured is by proximity to population centers. This is true not only of the Twin Cities' commercial service airport, which is important to businesses and individuals for airline travel worldwide, but also of its general aviation airports, which accommodate a far wider set of aviation activities. Thus, the proximity of airports that accommodate a full range of the general aviation fleet to metropolitan populated areas is key.

To evaluate the adequacy of Metropolitan Council's aviation system as it relates to its ability to provide adequate ground access, the following benchmarks are used:

- Percent of population and area within 60 and 90 minutes of a *Major Airport*
- Percent of population and area within 45 minutes of an *Intermediate Airport*
- Percent of population and area within 30 minutes of a *Minor II Airport*
- Percent of population and area within 30 minutes of a *Minor I Airport*
- Percent of population and area within 30 minutes of a *Special Use Airport*

Special Use Airports, due to the nature of their operations, draw users from an indeterminate area. For analysis purposes, this study used an area encompassed by a 30-minute drive time.

The coverage provided by all airports (except Special Purpose Airports) in the Twin Cities region is based on 45-minute drive times from MSP and 30-minute drive times from all other airports. Nearly the entire metropolitan region is within the service area of a system airport, with 83% of the metropolitan region covered. The vast majority of the region's projected 3.7 million population falls within the service area of the system airports. Based upon the 2030 population projection for the metropolitan region, 76% of the population is expected to be within the service area of a system airport.

The ground drive time coverage for MSP, the single *Major Airport* in the regional system, provides adequate access for commercial passenger travel for the region's citizens during non-peak travel times and provides 97% population coverage during the afternoon peak congestion. The general aviation airports – *Intermediate, Minor I, Minor II,* and *Special Purpose Airports* – provide varying ground travel time coverage to different portions of the metropolitan region. However, cumulatively, these airports, along with coverage provided by MSP, provide 76% of convenient ground travel time coverage to the 2030 projected population of the region. The areas not covered are portions of western Hennepin County, Anoka County, and Scott County, along with some

of the downtown Minneapolis area and the southeastern corner of Dakota County. The collar county airports provide some additional coverage for these areas with 30-minute ground travel time access.

On-Time Performance

The data series used to calculate on-time performance for arrivals is the FAA's Aviation System Performance Metrics (ASPM) database. This data is calculated on a monthly and annual basis and staff is currently in the process of getting this data. Within this data set, aircraft must be airborne in order to be considered delayed; therefore, cancelled and/or diverted flights are not considered late in this system. Scheduled times typically include some cushion for delay, especially for arrivals operating during peak periods. A delayed flight can be attributed to mechanical problems, lack of crew or poor weather, and is not limited to capacity constraints. The table below shows on time departures for MSP in 2012 and the peer cities discussed in the next section.

Table 7-4: On-Time Performance

Cities	On Time Performance
Minneapolis/St. Paul - MSP	87.82
Atlanta, GA – ATL	83.90
Charlotte, NC – CLT	86.73
Denver, CO – DEN	78.76
Detroit, MI – DTW	84.43
Philadelphia, PA – PHL	84.72
Pittsburgh, PA – PIT	86.07

Data from Bureau of Transportation Statistics.

Twin Cities Regional Aviation System Compared with other Regional Systems

Given the merger between Delta and Northwest, other airline hubs that have experienced consolidation were examined in an attempt to draw parallels. Since 2000, American Airlines downsized its hub at St. Louis; US Airways closed its Pittsburgh hub, Delta closed its Dallas hub and has cutback Cincinnati and Memphis. Following the Delta-Northwest merger, the combined airline will have a network that includes seven domestic hubs and nine regional carrier subsidiaries or code sharing partnerships.

To put the Twin Cities Regional Aviation System in perspective, it was compared to six peer airport systems. These peer airport systems were selected on the basis of having similar populations, and a single major commercial airport serving as a hub for an airline. It was determined that airport systems in Atlanta, Charlotte, Denver, Detroit, Philadelphia, and Pittsburgh were suitable peers.

A comparative analysis was conducted to provide insight into how other regional systems function when compared with MSP and its regional airport system. The analysis also evaluated the roles of these airports within the system and how the demographics of these similar metropolitan areas are tied to their airports. Six peer airport systems were identified for the comparative analysis with the Twin Cities Regional Airport System based on several factors, including:

- Only one major hub airport serves the metropolitan area,
- Low cost airline service was present at some time at the major hub airport, since Southwest recently began service at MSP, and;
- The airports rank in the top 20 in terms of activity.

As part of the regional system comparison, several factors were used to help benchmark these airports:

- Population of the associated Twin Cities metropolitan statistical area (13-county area, according to the US Census) ,
- Number of National Plan of Integrated Airport Systems (NPIAS) airports within the airport system,
- Number of reliever airports within the airport system,
- Number of general aviation (GA) based aircraft within the airport system,
- Number of corporate jet based aircraft within the airport system,
- Annual general aviation operations within the airport system, and;
- Number of system airports with runways at least 5,000 feet in length.

These factors provide the basis from which to make an effective comparison of the Twin Cities regional aviation system and offer a glimpse of the potential future in these ever changing economic times.

Table 7-5: Airport System Factor Comparison

Name	MSA Population	NPIAS Airports	Reliever Airports	Based Aircraft	Jets	Annual Operations	Number of Airports with Runways 5000 feet
Atlanta	5,278,904	13	4	1,907	175	868,710	9
Charlotte	1,651,568	5	2	350	30	253,566	3
Denver	2,464,866	4	3	1,509	125	605,315	3
Detroit	4,467,592	10	7	1,474	208	593,555	3
Minneapolis – St. Paul	3,208,212	87	7	1,913	137	465,335	4
Philadelphia	5,827,962	18	10	1,656	78	772,550	3
Pittsburgh	2,355,712	10	5	693	93	345,569	3
Average	**3.607.831**	**10**	**5**	**1,357**	**121**	**582,974**	**4**

Sources: US Census, 2007, and FAA, 2010

As illustrated in Table 7-5, the Twin Cities regional aviation system is robust and compares well with its peer airport cities. A similar comparison was made to evaluate the number and type of aircraft operations that occurred at the system's hub airport. Table 7-6 summarizes the total number of aircraft operations for the years 2010 and 2000 since this was the last peak year in operations before the terrorist attacks on Sept. 11, 2001. The table then compares the percentage of commercial service operations and the percent of general aviation operations to determine whether general aviation operations decline

as commercial activity increases. The premise is that pilots of smaller and slower aircraft, such as single engine propeller aircraft, are less interested in flying into a hub airport due to wake turbulence issues and the intensely controlled environment compared to a nearby reliever airport. As shown in Table 7-6, Atlanta had the most aircraft operations and the most commercial service aircraft operations in 2000 and 2010, and received the title "world's busiest airport."

Table 7-6: Peer Airport Operations Comparison

	2000			2010		
Name	**Aircraft Operations**	**Percent Commercial Operations**	**Percent General Aviation Operations**	**Aircraft Operations**	**Percent Commercial Operations**	**Percent General Aviation Operations**
Atlanta	915,454	97.4%	2.4%	994,346	98.7%	1.2%
Charlotte	452,009	89.7%	9.6%	522,541	93.5%	6.1%
Denver	520,073	91.9%	2.9%	614,065	95.8%	0.9%
Detroit	555,375	87.9%	11.8%	467,230	97.6%	2.4%
Minneapolis – St. Paul	523,146	84.9%	11.1%	452,972	89.4%	6.7%
Philadelphia	484,308	87.3%	12.6%	499,653	94.9%	4.6%
Pittsburgh	448,785	93.3%	5.5%	209,303	88.1%	7.5%
Average	**548,338**	**90%**	**8%**	**578,697**	**95%**	**4%**

Source: FAA

As shown in Table 7-6, MSP has a higher percentage of general aviation operations than its peer airports in 2010, except Pittsburgh, and was among a group of three airports with the highest percentage of general aviation operations in 2000. This helps support the need for reliever airports to accommodate additional general aviation operations within the Twin Cities Regional Aviation System. MSP has limited space for general aviation aircraft, including corporate jets; however it has more general aviation facilities located on-airport than Atlanta. And similar to Atlanta, there are several airports near MSP that cater to corporate aviation, such as St. Paul Downtown. As MSP air carrier operations increase, so does airfield congestion, thus shifting general aviation operations to reliever airports, which helps reduce airfield congestion and associated delay costs.

Peer Airport Aviation Activity Comparisons

An analysis of the peer airports was conducted to review the aviation activity of these U.S. airports and to compare passenger enplanements, aircraft operations, and cargo tonnage. These comparisons help to gauge how MSP ranks among its peers.

Passenger Enplanements

Table 7-7 presents the peer group's passenger enplanements for 2000, and 2010 as compared to the entire U.S. passenger totals. An enplanement is a passenger that boards an aircraft. This passenger may be just starting their trip or they may be part-way through their trip and changing aircraft at an airport.

Two other terms relating to the number of passengers are used in this section – connecting passengers, and origin and destination (O&D) passengers. Connecting passengers are travelers at an airport that have just departed one plane and boarded another to continue their trip. O&D passengers are those that are either beginning or ending their trip at that airport. While there is some overlap in the use of these terms, they are used in specific areas of airport planning.

As shown, overall US total passenger enplanement numbers have grown from 709 million in 2000 to 762 million in 2010. Both MSP and Detroit passenger levels remained constant and nearly identical, ranging between 16 and 18 million passengers over the past eight years. MSP showed a decline in enplanements between 2000 and 2010 of 4%. Many of the peer airports showed growth over the same period with New York's Kennedy Airport showing the greatest growth (7.5 million enplanements or 46%) Overall growth of enplanements for the entire country was 7%.

As expected, the largest hub airports, Atlanta, Chicago-O'Hare, Los Angeles, and Dallas-Ft. Worth, remain ranked at the top year after year.

Table 7-7: Peer Airport Enplanement Comparison (in millions)

Airport	2000 Enplanements	2010 Enplanements	Change in Enplanements 2000 to 2010	Percent Change
Atlanta	40.2	44.8	4.6	11%
Charlotte	12.4	16.6	4.2	34%
Denver	19.4	24.9	5.5	28%
Detroit	17.7	18	0.3	2%
Minneapolis – St. Paul	18.2	17.5	-0.7	-4%
Philadelphia	13.9	16	2.1	15%
Pittsburgh				
US Total	**709.8**	**762.4**	**52.6**	**7%**

Source: FAA

Aircraft Operations

Table 7-8 presents the aircraft operations totals for the top 20 airports for the years 2000, 2005 and 2010 as compared to the entire U.S. total. As shown, U.S. aircraft operations have fallen from almost 68 million operations in 2000 to less than 61 million operations in 2010. Much of this can be attributed to

the shedding of excess seating capacity, the retirement of older, fuel inefficient aircraft by the airlines following the 9/11 attacks, and the economic downturn.

Table 7-8: Peer Airport Aircraft Operations Comparison (in thousands)

Airport	2010 Operations	2000 Operations	Change in Operations 2000 to 2010	Percent Change
Atlanta	994	915	79	9%
Charlotte	523	452	71	16%
Denver	614	511	103	20%
Detroit	467	555	-88	-16%
Minneapolis – St. Paul	453	523	-70	-13%
Philadelphia	500	484	16	3%
Pittsburgh	209	449	-240	-53%
US Total	**60,807**	**67,682**	**-6,875**	**-10%**

Source: FAA

As illustrated in Table 7-8 Denver showed the greatest growth in operations between 2000 and 2010 among the peer group of airports. MSP and Detroit Metro Wayne County Airport (DTW) typically have had similar aircraft operation levels year after year and have ranked sixth or seventh in the country until recently. MSP peaked in 2004 with 541,000 operations and DTW peaked in 2000 with 555,000 operations. Although DTW's fourth parallel runway opened in 2003 and MSP's new runway opened in late 2005 providing additional airfield capacity, the economy and high fuel prices forced Northwest Airlines and Delta Air Lines to file for bankruptcy protection shortly thereafter. Aircraft operations at both of these airports have been down since 2005.

Future Performance Measures

As data becomes more accessible and transparent, the following areas could be used for future performance measures. These measures are not related to federal requirements, but staff understands that data collection is possible, and could be measured in the future. These measures are divided into six categories, or Performance Areas, (Core, Safety and Security, Service Quality, Cost Effectiveness, Financial and Environmental). The following is a summary of what these measures could consist of:

- Core – these are the core measures used to characterize and categorize airports, such as the number of passengers and operations. Although airports may have little control over these core indicators, especially in the short term, they are important indicators of overall airport activity, and important drivers and components of other indicators.
- Safety and Security - these are the most important airport responsibilities, and therefore they are categorized separately.
- Service Quality - this increasingly important area reflects the evolution of airport management from having a primary focus on facilities and operations to having a strong customer service focus in an increasingly competitive environment.
- Productivity/Efficiency - these measures are closely related/overlapping measures of an airport's performance. They sometimes are separated into productivity measures, which track output, (passengers per airport

employee or departures per gate), and efficiency measures, which track output on a cost basis—(total or operating cost per passenger).

- Financial – this includes measures relating to airport charges, airport financial strength and sustainability, and the performance of individual commercial functions
- Environmental - this evolving area has become a strong focus for airport managements striving to minimize environmental impacts.

Trends / Summary

As of the summer 2012, MSP and the metropolitan regional system are tracking reasonably well with respect to other comparable systems and other hub airports, which indicates that it is a mature system that needs little in the way of expanded facilities. Passenger enplanements have been increasing but with the deep and likely prolonged recession and volatile fuel prices, uncertainty remains. Airlines continue to cut or redirect capacity. Discretionary business and general aviation activity is down slightly. The peer review of other airports suggest that Delta has in the past made hard decisions to close or scale back connecting hubs at Dallas-Ft. Worth and Cincinnati. These network changes resulted in considerable loss of enplanements (and revenues) at the affected airports. St. Louis, Pittsburgh and Cincinnati are all grappling with excess terminal space following changes in hub status. Revenue diversification and redevelopment of airport property are top priorities at these and other airports that have experienced cutbacks in aviation activity. Airport hubs in the eastern region and mountain states are experiencing the largest growth. Further analysis into fleet mix, service levels, and economic conditions are needed to better assess why the airports on the West Coast and in the central region appear to be growing more slowly or languishing. Finally, Southwest's and Spirit's entry into the MSP market has been positive. Sun Country airlines is experiencing growth, and the outlook on low cost carrier options is exceptional. Experience at other airports where Southwest has recently started service suggests that additional nonstop cities are likely to be added at MSP once Southwest can redeploy existing aircraft.

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2012

Transportation System Performance Evaluation

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