2020 TRANSPORTATION SYSTEM PERFORMANCE EVALUATION

METROPOLITAN COUNCIL

The Council's mission is to foster efficient and economic growth for a prosperous metropolitan region

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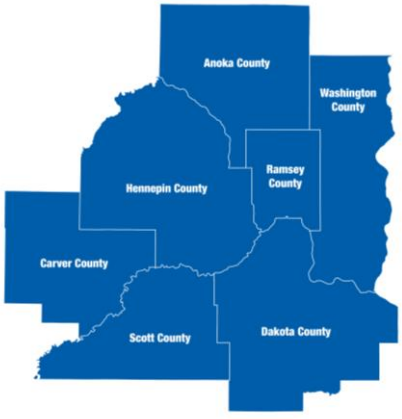

The Metropolitan Council is the regional planning organization for the seven-county Twin Cities area. The Council operates the regional bus and rail system, collects and treats wastewater, coordinates regional water resources, plans and helps fund regional parks, and administers federal funds that provide housing opportunities for low- and moderate-income individuals and families. The 17-member Council board is appointed by and serves at the pleasure of the governor.

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Contents

Executive Summary

This report is a comprehensive review of the Twin Cities transportation system as prepared by Metropolitan Council in 2020. The Minnesota State Legislature adopted statutes in 1996 requiring the Metropolitan Council to produce this report (previously called the Transportation System Audit). This report was prepared to inform the 2020 update of the region's long-range transportation plan, the 2040 Transportation Policy Plan (2040 TPP).

2040 Transportation Policy Plan: Updated Regional Transportation Benchmarks

Minnesota has a long and respected history of performance- based transportation planning, operations, and decision- making. The 2040 TPP advances this philosophy and identifies six goals for the regional transportation system, including a framework for how to achieve them. The goals identified in the 2040 TPP include:

- Transportation system stewardship
- Safety and security
- Access to destinations
- Competitive economy
- Healthy environment
- Leveraging transportation investment to guide land use

These goals can directly contribute to the vision in Thrive MSP 2040, the Metropolitan Council's long-term comprehensive development guide for the seven-county Twin Cities area that provides the vision for our region's future. The 2040 TPP goals and objectives respond to Thrive's policy direction and tie to the regional outcomes it identifies. The 2040 TPP links each goal with one or more of the Thrive outcomes:

- Stewardship
- Prosperity
- Equity
- Livability
- Sustainability

Consistent with Minnesota practice and U.S. Department of Transportation requirements, the Council is also working to develop performance measures and targets to evaluate the effectiveness of our region's actions on achieving these goals and outcomes. When relevant, these performance measures are now incorporated into the Transportation System Performance Evaluation.

Transportation System Stewardship

Sustainable investments in the transportation system are protected by strategically preserving, maintaining, and operating system assets.

Safety and Security

The regional transportation system is safe and secure for all users.

Access to Destinations

People and businesses prosper by using a reliable, affordable, and efficient multimodal transportation system that connects them to destinations throughout the region and beyond.

Competitive Economy

The regional transportation system supports the economic competitiveness, vitality, and prosperity of the region and state.

Healthy Environment

The regional transportation system advances equity and contributes to communities' livability and sustainability while protecting the natural, cultural, and developed environments.

Leveraging Transportation Investment to Guide Land Use

The region leverages transportation investments to guide land use and development patterns that advance the regional vision of stewardship, prosperity, livability, equity, and sustainability.

Scope of this Report

This document reviews the changing demographics of the region, focusing on population and employment changes from 2013 to 2018. The review of demographics includes 2000 and 2010 US Census data, as well as 2017 American Community Survey data. There are some areas where the 2019 Transportation Behavior Inventory (TBI) data has been used. The various modes of transportation (highways, transit, freight, bicycle and pedestrian, aviation) are reviewed within their own chapters. Comparisons to peer regions are made where applicable. Each modal chapter includes an existing system description, a review of the system performance where data is available, and a discussion of issues and trends for that system, called Findings and Conclusions.

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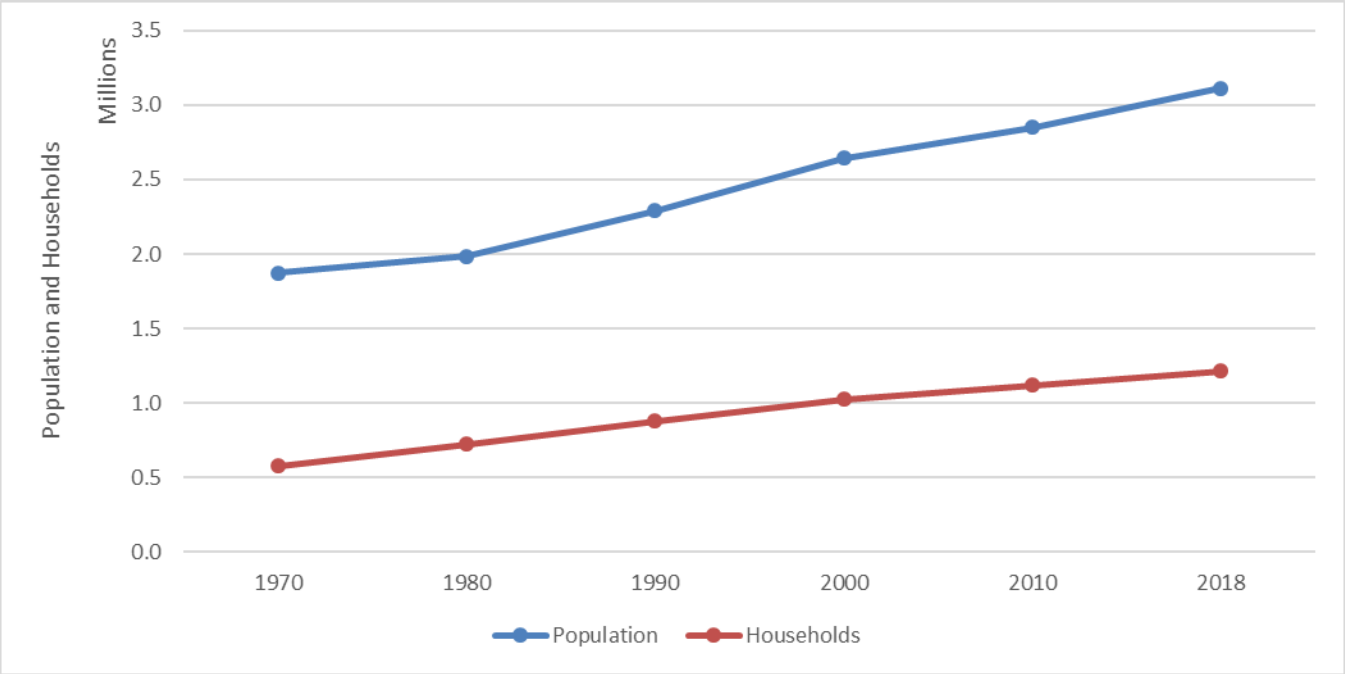
Findings and Conclusions

The Region

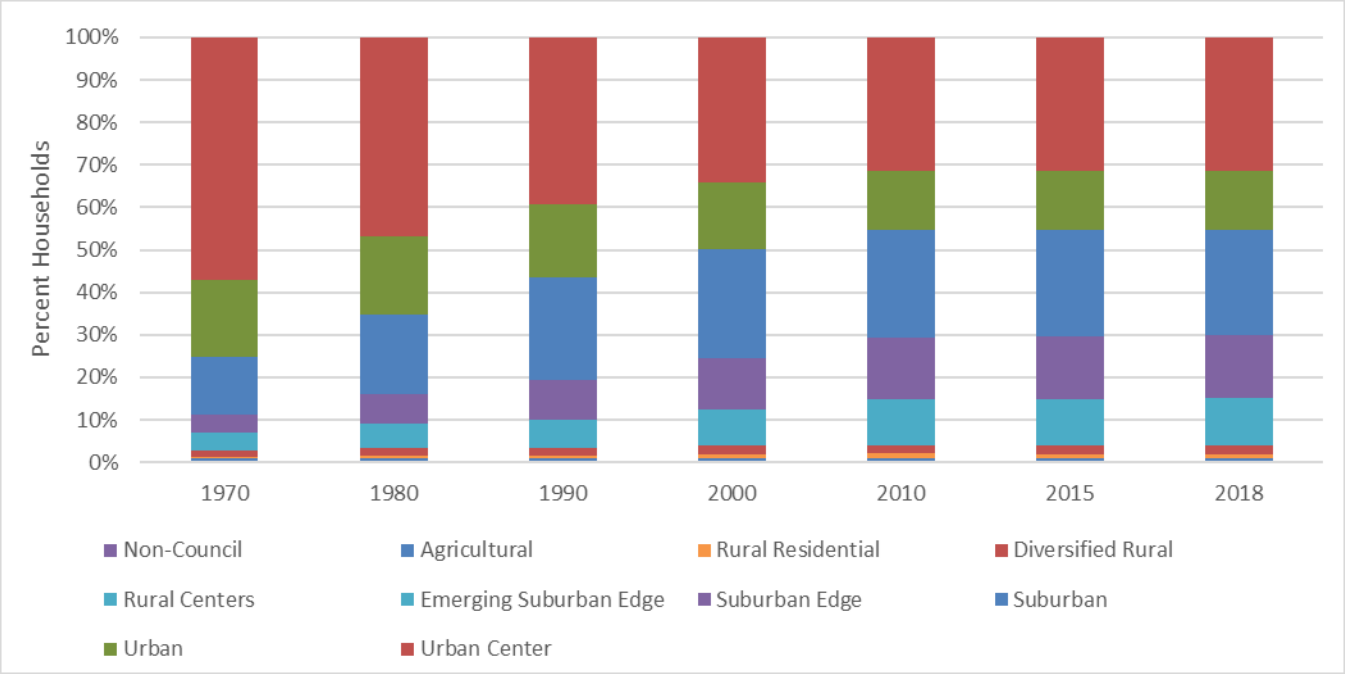
The Twin Cities region has been gaining population and households steadily since 1970, as shown in **Figure ES-1**. Growth in population has outpaced growth in households leading to a slight increase in average household size.

Figure ES-1: Population and Households in Twin Cities Region



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 over the last 48 years. **Figure ES-2** shows this trend slowed starting in the year 2000, and Minneapolis and Saint Paul added nearly 74,000 people since 2010.

Figure ES-2: Percent Households by Framework Area

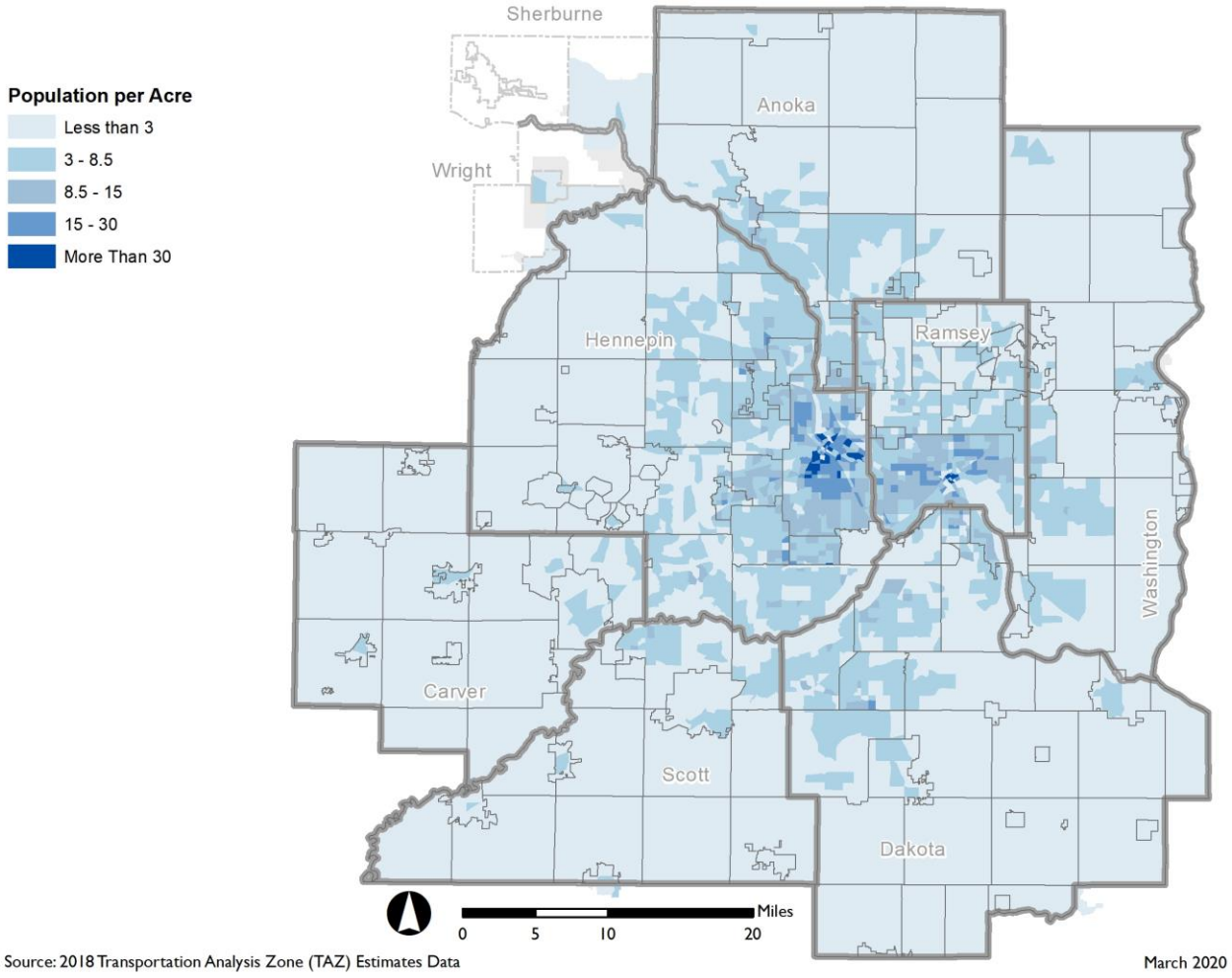


With recent high-rise multi-family and infill development, the downtown areas of Minneapolis and St. Paul have the densest areas of population in the region. The central cities are more densely developed than the suburbs. There are pockets of dense development in the outer-ring suburbs, but **Figure ES-3** shows overall, density falls dramatically while moving outward from the downtown areas and central cities.

As population density decreases by community designation, average vehicle miles traveled per household increases (except in rural centers).

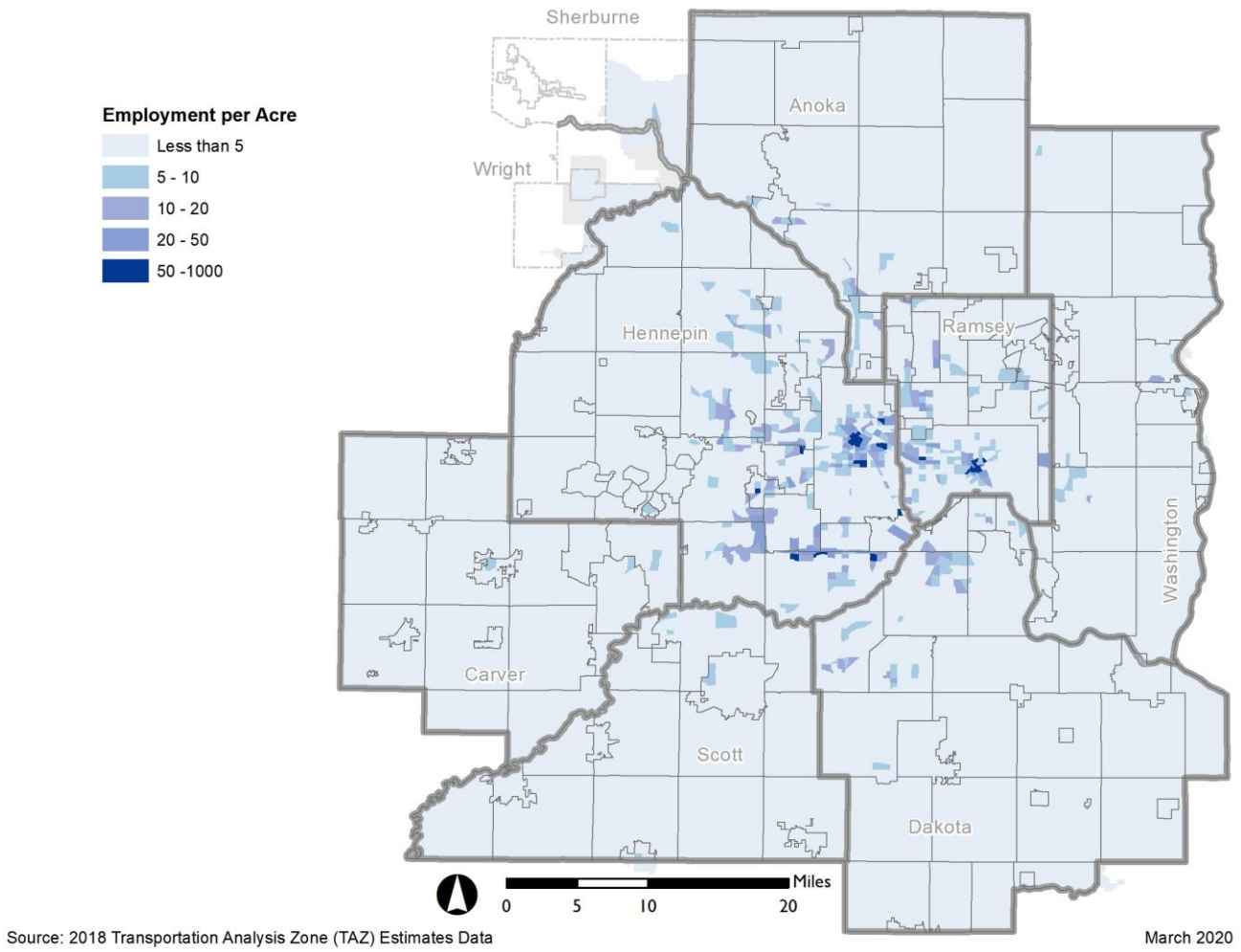
When analyzed by community designation, there is also an inverse relationship between population density and vehicle miles traveled. As population density decreases by community designation, average vehicle miles traveled per household increases (except in rural centers). In a related fashion, transit commute percentages by community designation increase as population density increases. There is more information on this in Chapter 2.

Figure ES-3: 2018 Population Density of Twin Cities Region



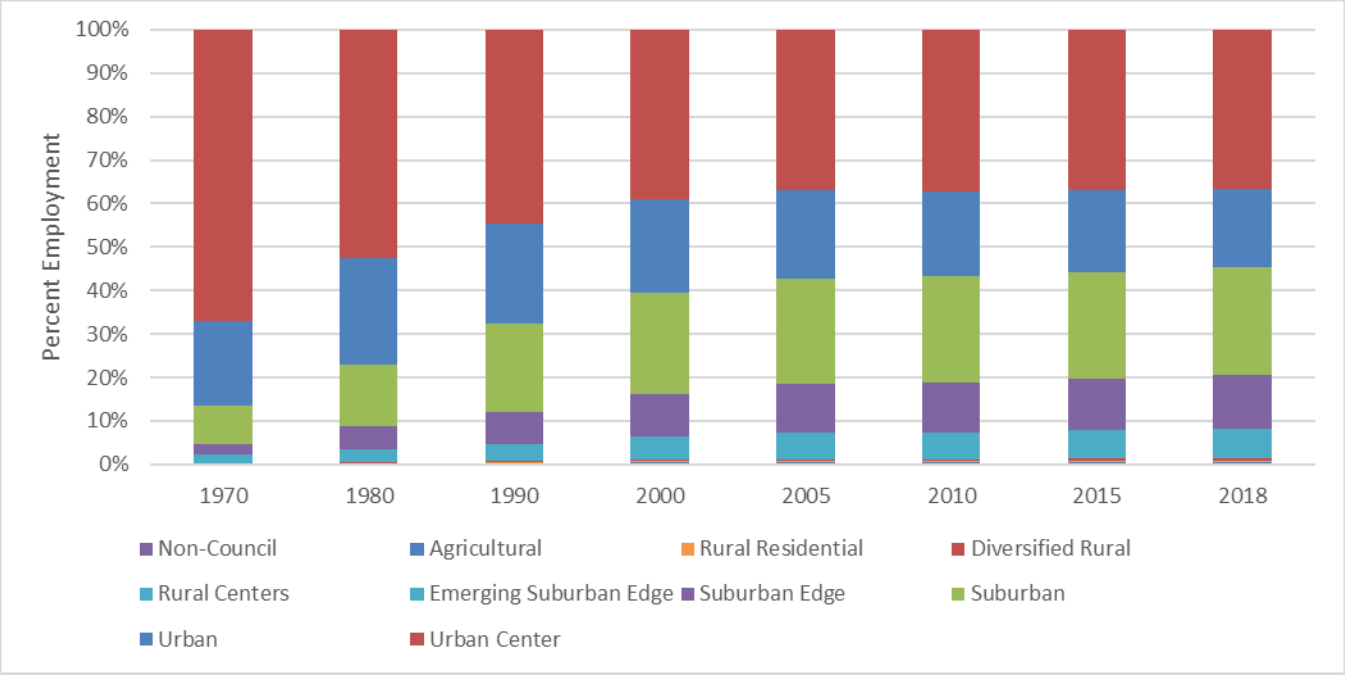
The downtown areas of Minneapolis and St. Paul have the highest concentrations of jobs in the Twin Cities region. **Figure ES-4** also shows that outside of the downtown areas, employment density varies greatly. There are several other large job clusters located along major highway corridors, especially in the southwest quadrant of the region.

Figure ES-4: 2018 Employment Density of The Twin Cities Region



Employment growth has been strong in the region over the last 19 years, especially when acknowledging the impacts from for two economic recessions. However, the recovery has not been geographically balanced. **Figure ES-5** shows from 2000 to 2018, employment fell 2.4 percent in urban centers, while increasing more than 16 percent in the suburban edge and emerging suburban edge. Over 43 percent of jobs in the region are in suburban areas, compared to just below 55 percent in urban areas.

Figure ES-5: Percent Employment by Framework Area



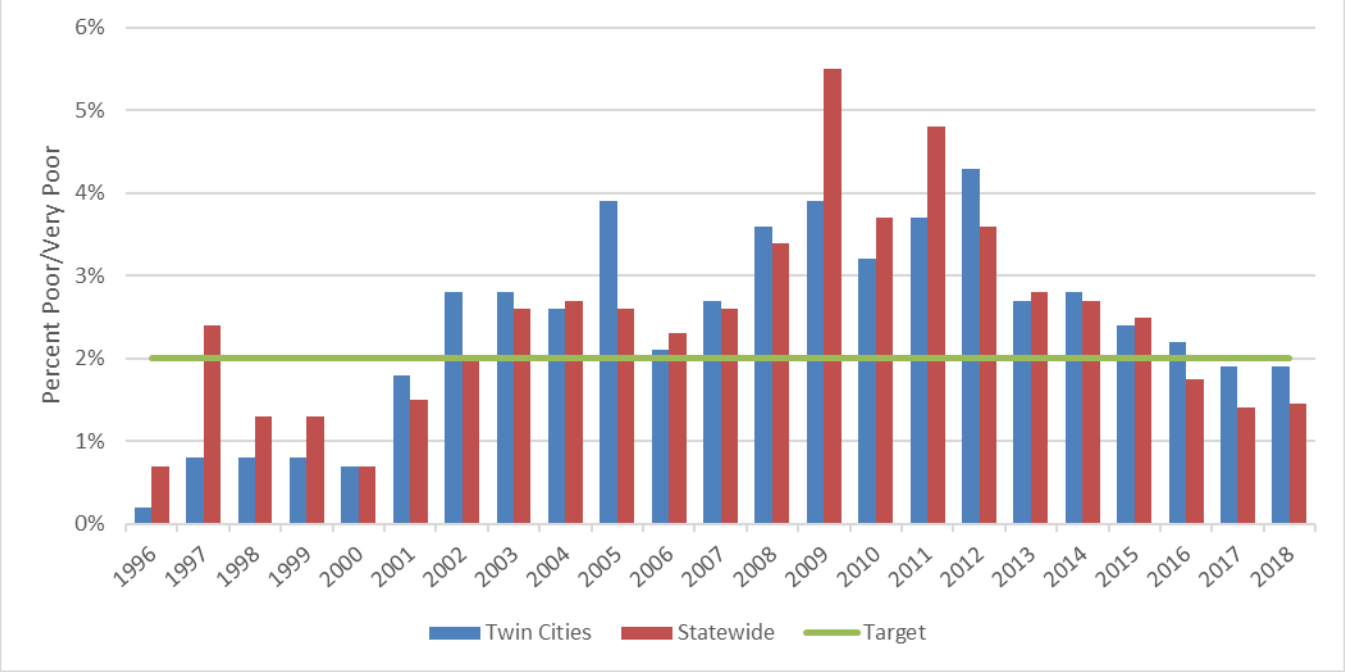
The Highway System

As the number of vehicles has steadily increased and highway revenues per vehicle have declined, highway performance management has needed to continue shifting toward pavement and bridge preservation, and system management strategies such as MnPASS lanes and ramp meters.

Roadway pavement quality in the Twin Cities Region had not met ride quality index (RQI) targets since 2001 until only recently. The percentage of regional principal arterials with a poor or very poor rating has generally decreased since 2009. In 2017 and 2018, the percentage of principal arterial with a poor or very poor rating met the RQI target. See **Figure ES-6** for principal arterial data, and more information is available in the Highway chapter.

Roadway pavement quality in the Twin Cities Region had not met ride quality index (RQI) targets since 2001 until only recently.

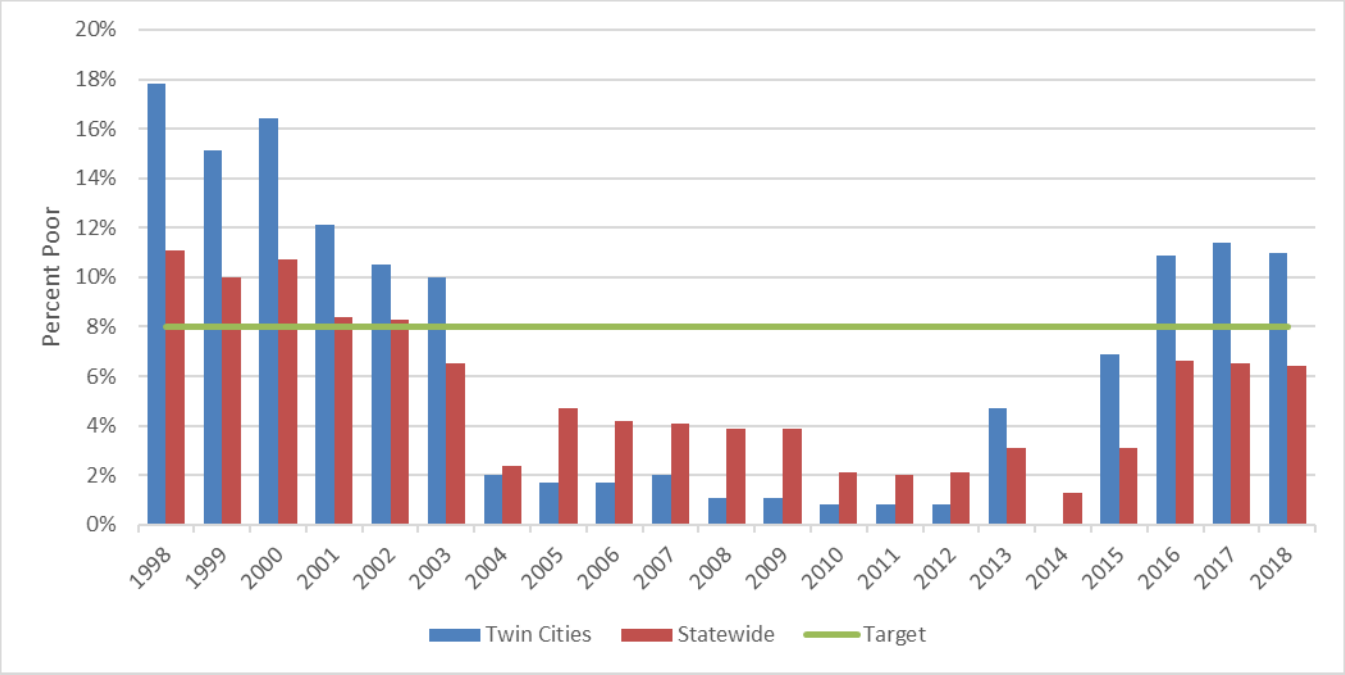
Figure ES-6: Principal Arterials – Ride Quality Index (RQI) in Poor/Very Poor Category



In 2018, principal arterial bridges met MnDOT targets for bridge condition in the Twin Cities Region however non-principal arterial bridges did not. The percentage of non-principal arterial bridge area in poor condition increased to a 15-year high in 2017, as shown in **Figure ES-7**, reaching approximately 11.5 percent, but decreased slightly in 2018.This trend should be monitored by MnDOT and Metropolitan Council. More information is available in the Highway chapter.

The percentage of non-principal arterial bridge area in poor condition increased to a 15-year high in 2017, reaching approximately 11.5 percent. This trend should be monitored by MnDOT and Metropolitan Council.

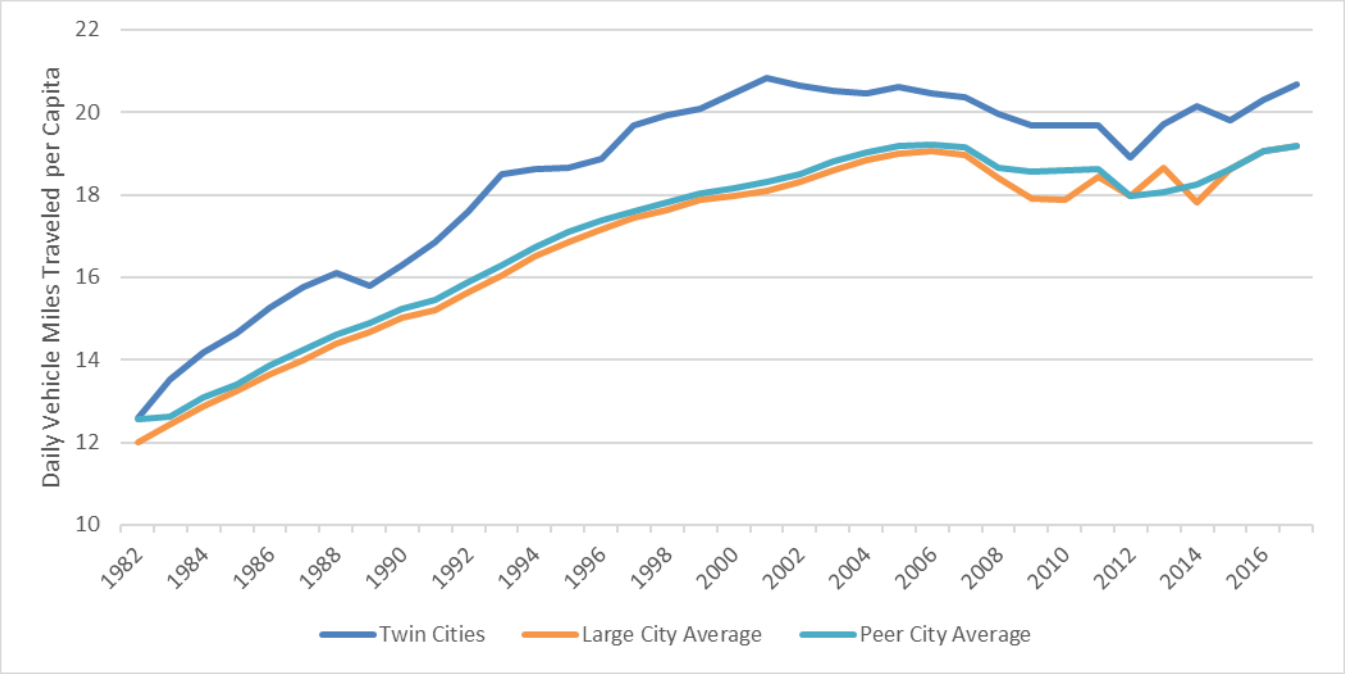
Figure ES-7: Percent Non-Principal Arterial Bridge Area in Poor Category



Annual vehicle miles traveled (VMT) has generally increased each year, except for a slight reduction in 2012 and 2015. **Figure ES-8** also shows that since 2000, VMT per person has stabilized as compared to the growth in the 1990s. VMT per person in the Twin Cities generally exceeds the average for peer cities.

While congestion is affecting more miles of the regional highway system over time, hours of delay per auto commuter and the proportion of travel time spent in delay has remained stable since 2000.

Figure ES-8: Daily Vehicle Miles Traveled per Person



Source: Texas Transportation Institute

The Transit System

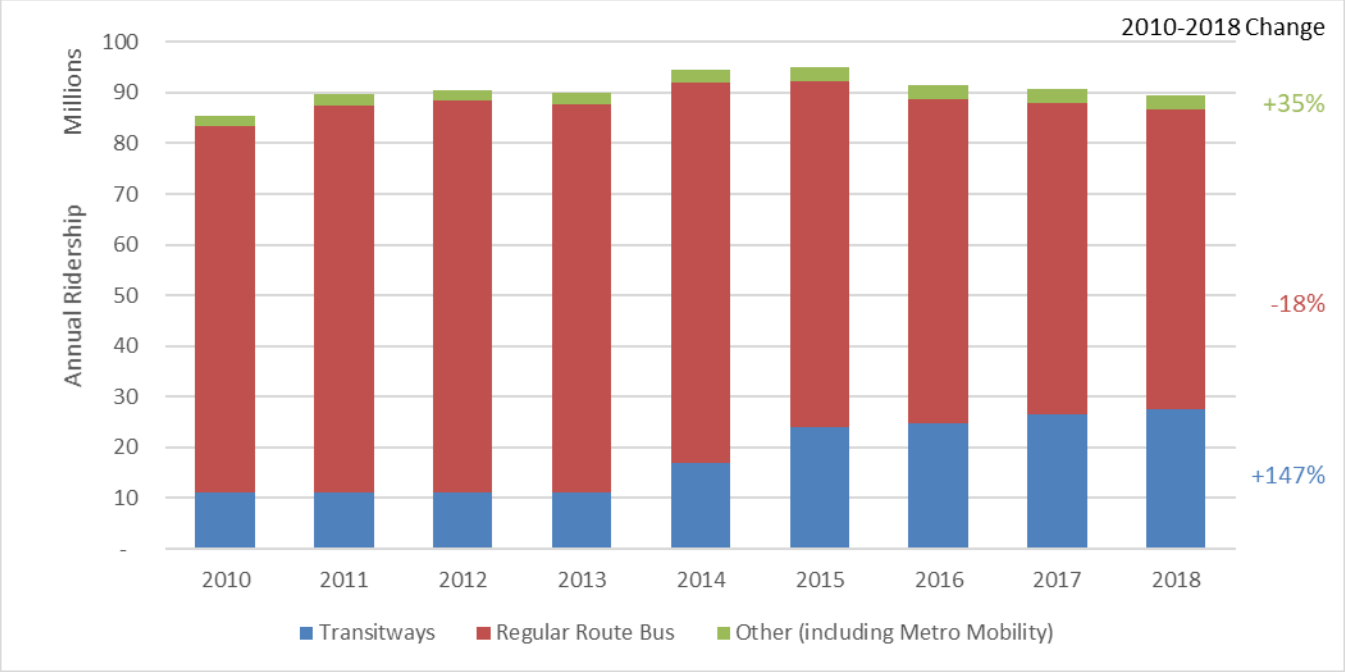
There are currently six modes of public transit service in the Twin Cities area: commuter rail, light rail transit, bus rapid transit (BRT), regular-route bus, dial-a-ride, and vanpool. The Twin Cities is home to five public transit providers, and the University of Minnesota Twin Cities transit service.

System ridership has increased over time as additional transit options have been added to the system. However, as illustrated in **Figure ES-9**, bus ridership has been on a decline both in absolute numbers and percentage of system ridership. There are several likely reasons for declining bus ridership.

These include:

- Restructuring of the bus network connecting to the METRO Green Line in 2014, resulting in a shift of riders from bus to rail that becomes particularly pronounced in 2014 and 2015 (see **Figure ES-9**)
- Lower fuel prices, creating less of a cost incentive to ride transit
- Growth in the express bus market that occurred during significant regional park-and-ride expansion has tapered off in the last few years
- Construction on the Nicollet Mall and the temporary relocation of bus routes that resulted in a less convenient option for some riders

Figure ES-9: Twin Cities Annual Ridership by Mode (2010-2018)



Despite some of these challenges, there have also been a number of success stories in transit where investments result in improved transit performance. The transit chapter includes a more thorough discussion of these successes:

- Ridership continues to grow on the region's transitway services; ridership on transitway services now make up 30% of regional transit ridership. 2018 saw the highest levels of light rail ridership yet in the region, with 25 million rides on METRO Green and Blue lines.
- The Arterial Bus Rapid Transit (ABRT) network continues to grow with the introduction of METRO C Line in 2019. The ABRT network has been a success in terms of ridership. METRO A Line carried 1.6 million rides in 2018 and in 2019 METRO A Line and C Line carried a combined 2.9 million riders with only six months of METRO C Line service.
- Microtransit services continues to find a role in the regional transit network. By the end of 2019 each suburban transit service provider had implemented a microtransit service. SouthWest Prime, the longest running microtransit service, now provides over 400 rides per day, an 800% increase since its introduction in 2015.
- The Transit Assistance Program (TAP) has found initial success in making transit more affordable for low income riders. Residents eligible for the program are able to use transit at a reduced fare of $1.00. In 2018, TAP riders saved approximately $1 million in fare payments

There have also been a number of success stories in transit where investments result in improved transit performance:

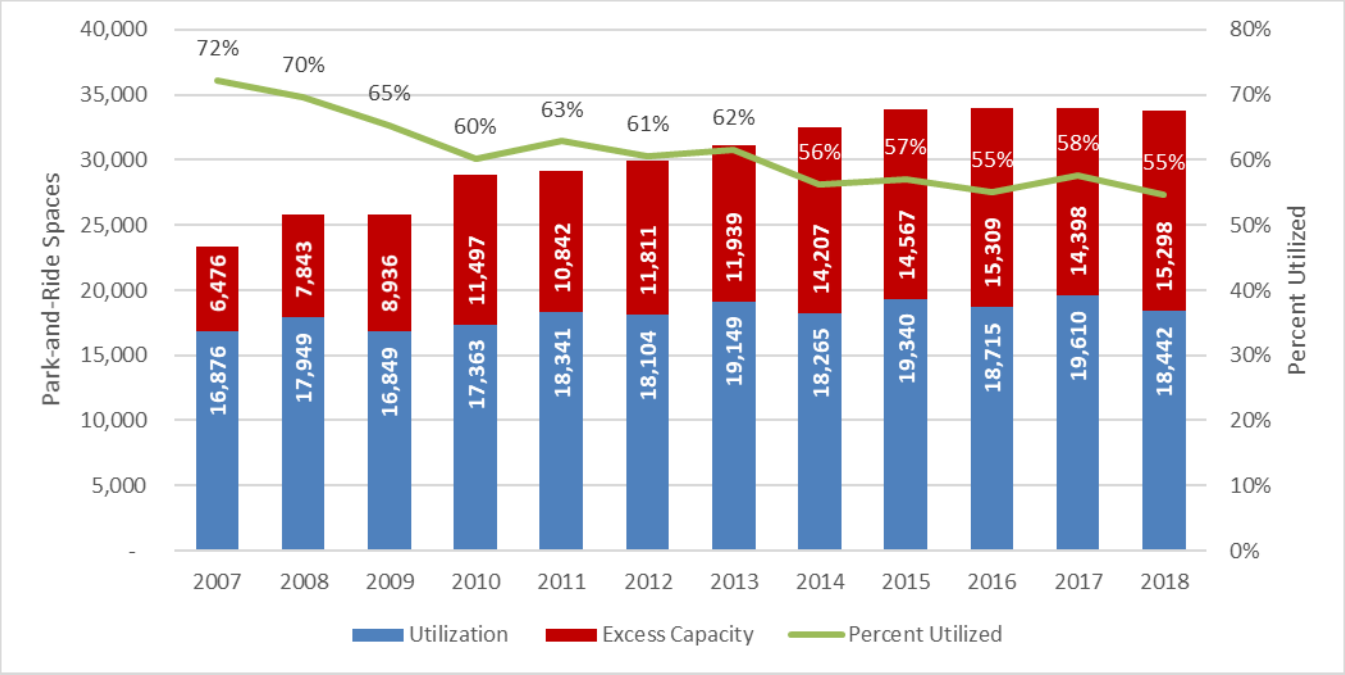
METRO Green Line and Blue Line – 25 million rides in 2018, highest annual ridership yet

METRO A Line and C Line – 2.9 million rides in 2019

Transit Assistance Program – $1 million in fares saved for low income riders

The region has also spent a significant amount of time and resources expanding the park-and-ride system over the last 10+ years and the result was increased demand for much of the last decade. However, demand growth has tapered off in the last few years, as seen in **Figure ES-10**, and the percent of spaces that are full on an average day has been nearly constant since 2010. The current capacity was built to support population growth for 2030, but tweaks to the system will still likely need to occur to adapt to changing demographics over time.

Figure ES-10: Twin Cities Transit System Park-and-Ride Utilization



Regional fare recovery has been declining over time leading to increasing subsidies per passenger as shown in **Figures ES-11** and **ES-12**. A few major contributing factors to this trend include:

- Increasing Metro Mobility ridership driving up its share of regional subsidy
- Declining bus ridership, despite increasing costs for providing bus services
- Though ridership continues to grow on the Green Line, it also introduced new operating expenses

Figure ES-11: Fare Recovery (2014-2018)

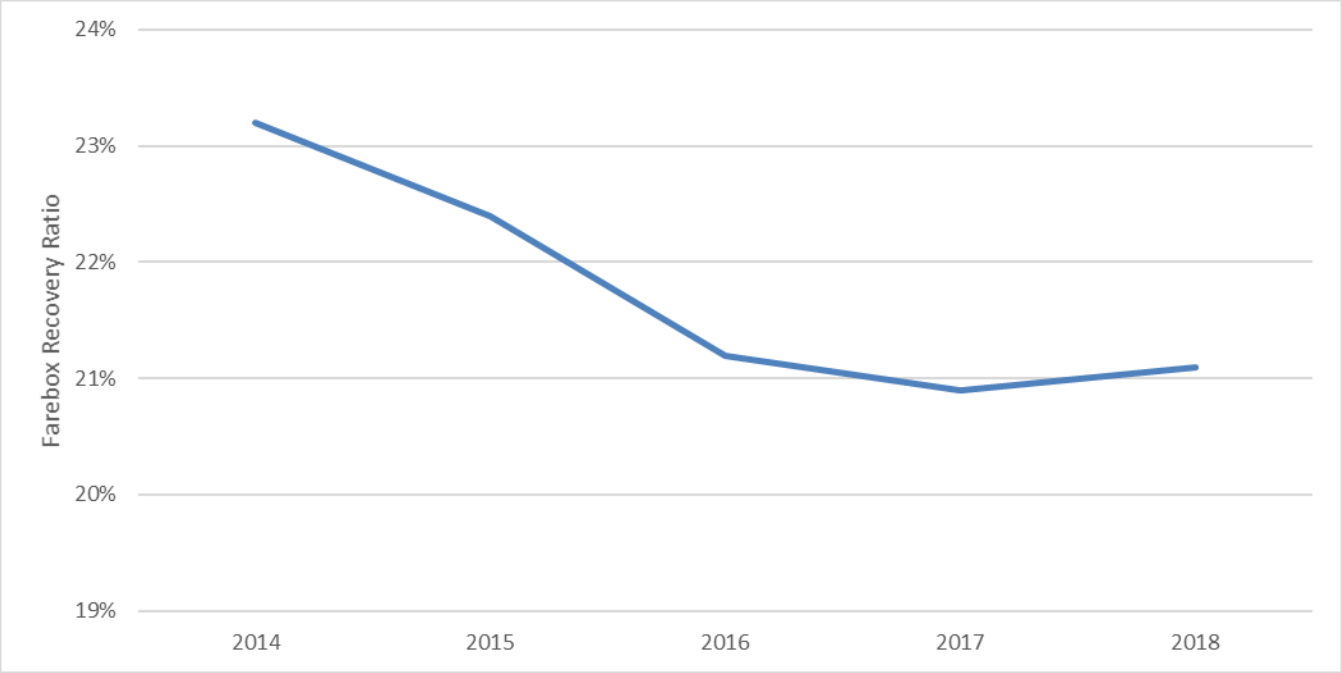
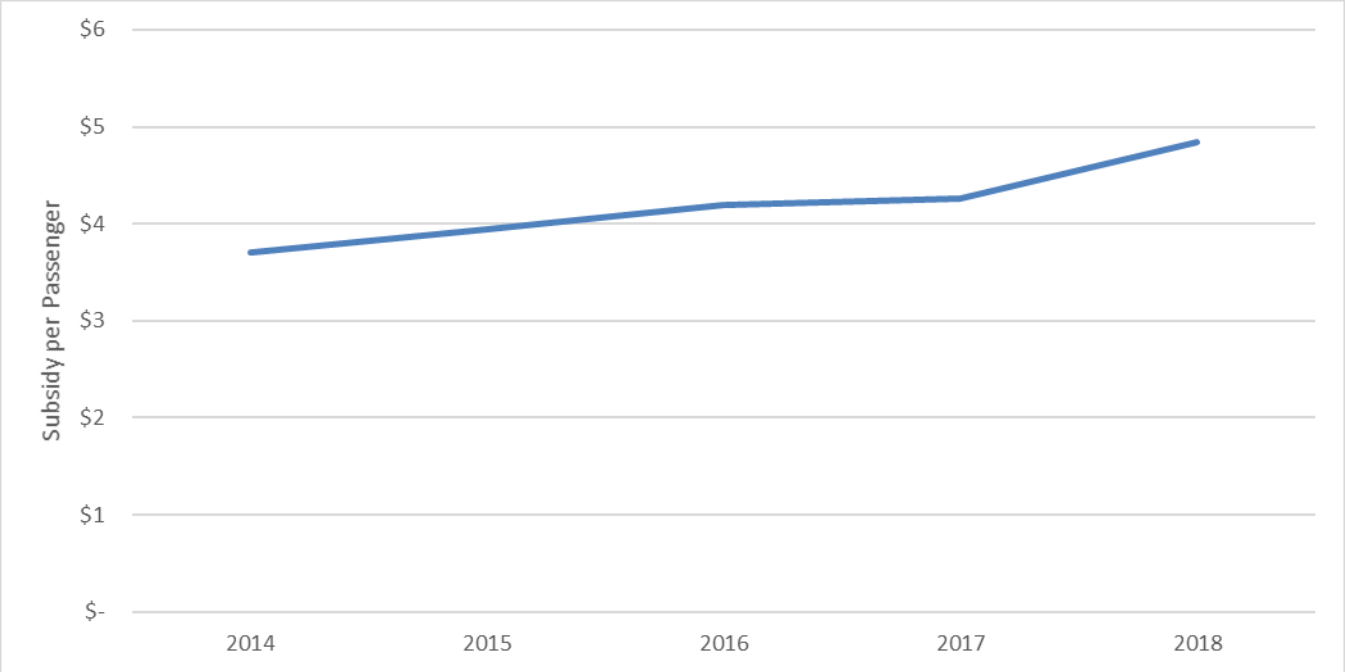


Figure ES-12: Subsidy per Passenger (2014-2018)



The Freight System

By 2012, freight shipments to and from the region had recovered from the 2007-2008 recession, with total tons of freight to and from the region exceeding 2007 levels by 6 percent. Growth in total value over the same period exceeded the growth in total freight tonnage, with an increase of 13.2 percent. **Figure ES-13** shows that trucking remained the dominant mode for freight as trucks carried nearly 87 percent of total freight value into and out of the region in 2012. Rail continued to carry a significant percentage of freight, moving 25 percent of all freight tonnage into and out of the region in 2012.

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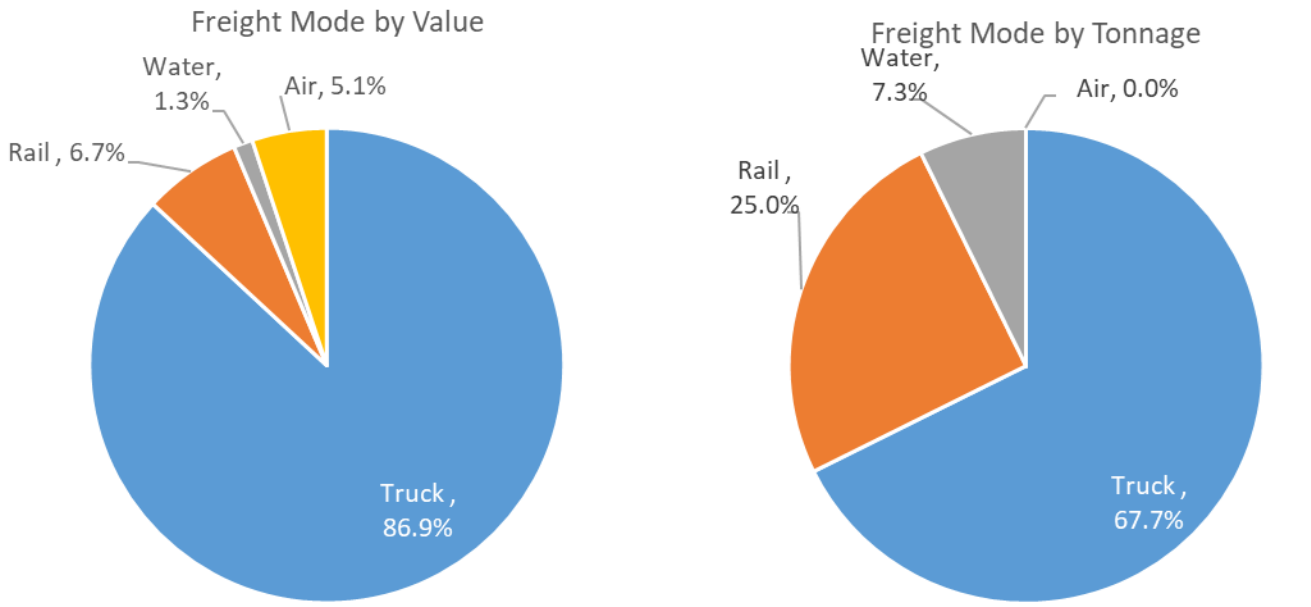
Figure ES-13: 2012 Regional Freight Modal Split by Value and Tonnage (Estimates Based on Multiple Data Sources)



The Bicycle and Pedestrian System

Bicycling and walking have become increasingly important in the Twin Cities for commuting to work or school, running personal errands, and traveling to entertainment and activity venues. The region has a strong infrastructure and policy foundation on which the regional bicycle and pedestrian systems are based, and the potential to further expand biking and walking in the region for transportation is significant.

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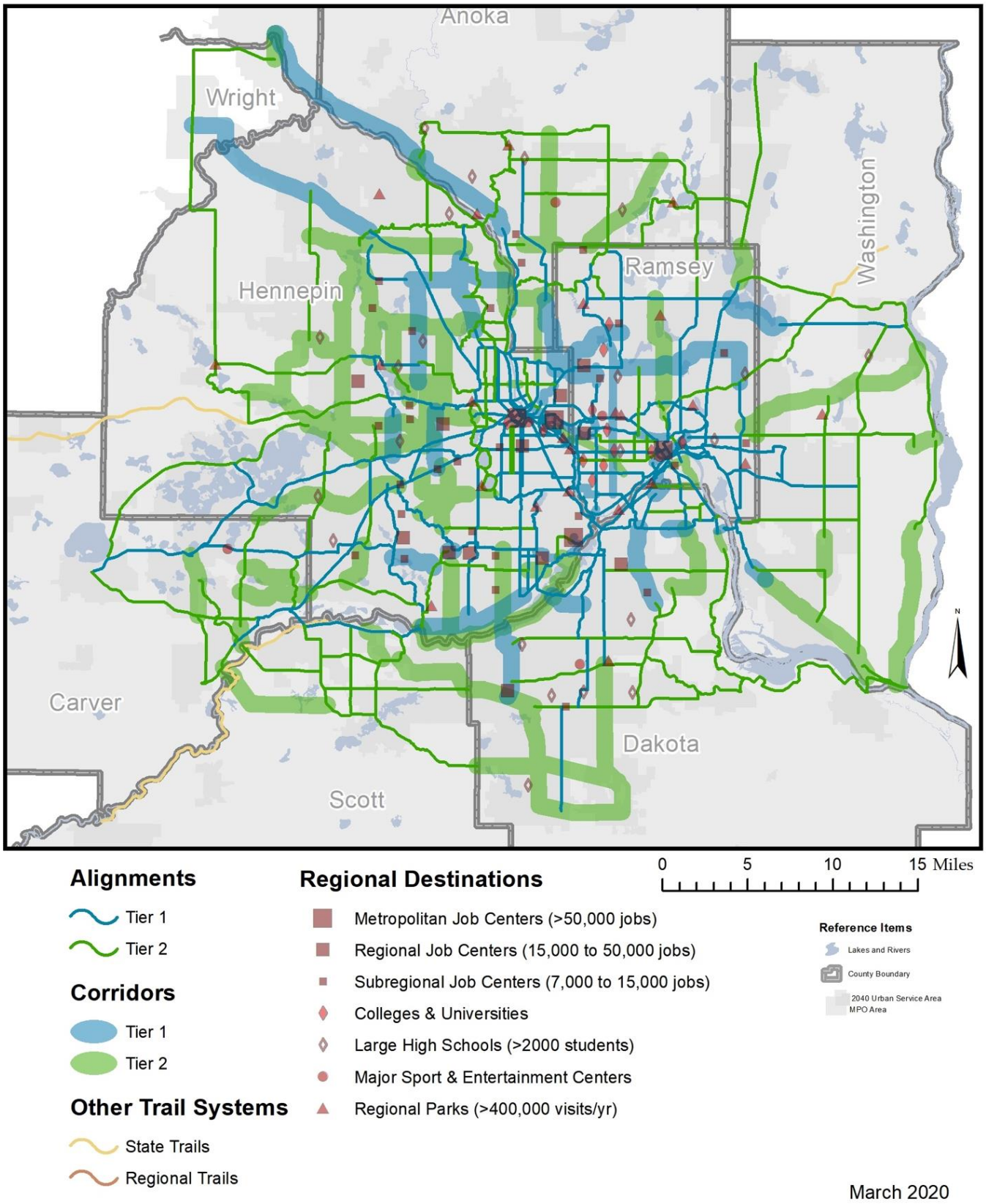
According to the 2019 TBI, 8.3 percent of all trips made within the seven-county region are done by walking, and 0.8 percent of all trips are made by bicycle. Since the 2010 TBI, the share of walking trips within the region increased by just over 2 percentage points and the share of bicycling trips decreased about 0.8 of a percentage point.

The Regional Bicycle Transportation Network is the region's planned vision for regional bikeways and is shown in **Figure ES-14**. It consists of more than 1,500 center-line miles of existing, planned, or anticipated on- and off-road bicycle facilities. Of the total network miles, roughly 45% are existing bikeways and 55% are planned bikeways.

The Council has developed a Regional Bicycle System Inventory in collaboration with the seven metropolitan counties that have coordinated with their municipalities to provide a region-wide reference mapping platform. This database includes all the existing and planned trails and on-street facilities from most cities that have developed local bicycle networks. As of 2016 there were more than 3,900 miles of existing bicycle facilities with another 2,860 miles anticipated in local bicycle plans.

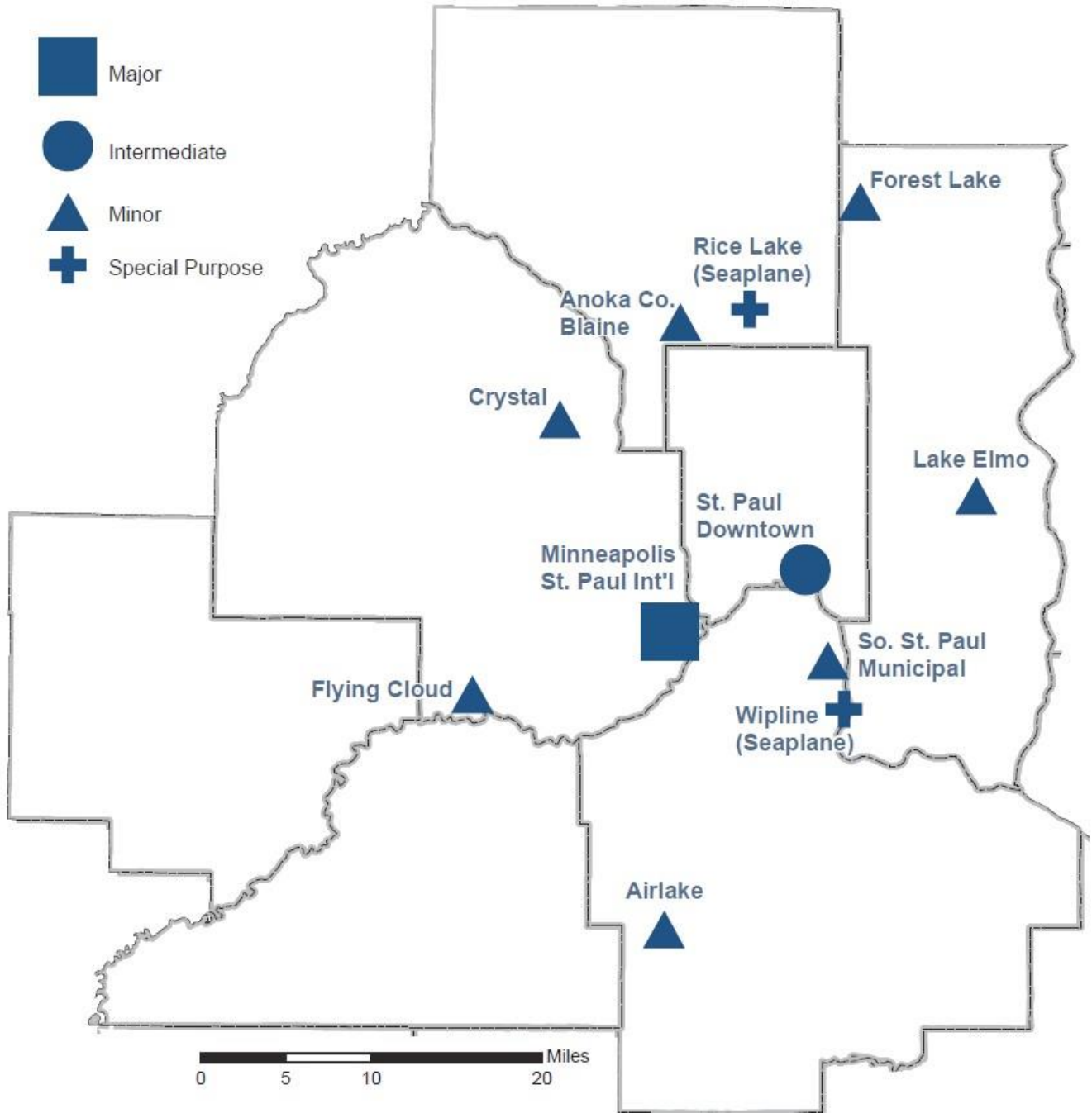
Figure ES-14. Regional Bicycle Transportation Network



The Aviation System

The Twin Cities region aviation system is shown in **Figure ES-15** and consists of eleven airports, one major airport and ten general aviation airports, that provide aviation services to the region.

Figure ES-15: Regional Airports by System Role



Since 2014, MSP has experienced a steady increase in passenger enplanements (114 percent) with a corresponding decrease in aircraft operations (72 percent). This trend is consistent with the airline industry trend to focus on productivity and use fewer flights with greater capacity (larger airplanes or simply putting more seats on existing airplanes) to serve major destinations.

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Chapter 1: The Purpose

This report is a comprehensive review of the Twin Cities transportation system as prepared by Metropolitan Council in 2020. This report was prepared to inform the 2020 update of the region's long-range transportation plan, the 2040 Transportation Policy Plan (TPP).

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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.
   The council must submit the performance evaluation to the chairs and ranking minority members of the house of representatives and senate committees

The Metropolitan Council completed the first full Transportation Systems Audit in 1997. Since that time the Metropolitan Council has prepared subsequent assessments of the transportation system as a whole and of the transit system separately. This report is an update of the 2016 Transportation System Performance Evaluation and several other iterations of the transit performance audit.

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Scope of this Report

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These goals can directly contribute to the vision in Thrive MSP 2040, the Metropolitan Council's long-term development guide for the seven-county Twin Cities area that provides the vision for our region's future. The 2040 TPP goals and objectives respond to Thrive's policy direction and tie to the regional outcomes it identifies. The 2040 TPP links each goal with one or more of the Thrive outcomes:

The 2040 TPP goals and objectives respond to Thrive's policy direction and tie to the regional outcomes it identifies.

- **Stewardship** advances the Council's longstanding mission of orderly and economical development by responsibly managing the region's natural and financial resources and making strategic investments in our region's future.
- **Prosperity** is fostered by investments in infrastructure and amenities that create regional economic competitiveness, thereby attracting and retaining successful businesses, a talented workforce, and consequently, wealth.
- **Equity** connects all residents to opportunity and creates viable housing, transportation, and recreation options for people of all races, ethnicities, incomes, and abilities so that all communities share the opportunities and challenges of growth and change.
- **Livability** focuses on the quality of our residents' lives and experiences in our region, and how places and infrastructure create and enhance the quality of life that makes our region a great place to live.
- **Sustainability** protects our regional vitality for generations to come by preserving our capacity to maintain and support our region's well-being and productivity over the long term.

Consistent with Minnesota practice and U.S. Department of Transportation requirements, the Council is also working to develop performance measures and targets to evaluate the effectiveness of our region's actions on achieving these goals and outcomes. When relevant, these performance measures are now incorporated into the Transportation System Performance Evaluation.

The *2040 TPP* goals and objectives are identified here, along with the relevant *Thrive MSP 2040* outcomes.

2040 TPP Goals and Objectives

Goal: Transportation System Stewardship

Sustainable investments in the transportation system are protected by strategically preserving, maintaining, and operating system assets.

OBJECTIVES

- Efficiently preserve and maintain the regional transportation system in a state of good repair.
- Operate the regional transportation system to efficiently and cost-effectively connect people and freight to destinations.

Thrive MSP 2040 Outcomes: Stewardship, Prosperity

Goal: Safety and Security

The regional transportation system is safe and secure for all users.

OBJECTIVES

- Reduce crashes and improve safety and security for all modes of passenger travel and freight transport.
- Reduce the transportation system's vulnerability to natural and man-made incidents and threats.

Thrive MSP 2040 Outcomes: Stewardship, Livability, Equity

Goal: Access to Destinations

People and businesses prosper by using a reliable, affordable, and efficient multimodal transportation system that connects them to destinations throughout the region and beyond.

OBJECTIVES

- Increase the availability of multimodal travel options, especially in congested highway corridors.
- Increase travel time reliability and predictability for travel on highway and transit systems.
- Ensure access to freight terminals such as river ports, airports, and intermodal rail yards.
- Increase transit ridership and the share of trips taken using transit, bicycling, and walking.
- Improve multimodal travel options for people of all ages and abilities to connect to jobs and other opportunities, particularly for historically underrepresented populations.

Thrive MSP 2040 Outcomes: Equity, Livability, Prosperity

Goal: Competitive Economy

The regional transportation system supports the economic competitiveness, vitality, and prosperity of the region and state.

OBJECTIVES

- Improve multimodal access to regional job concentrations identified in Thrive MSP 2040.
- Invest in a multimodal transportation system to attract and retain businesses and residents.
- Support the region's economic competitiveness through the efficient movement of freight.

Thrive MSP 2040 Outcomes: Prosperity, Livability, Sustainability

Goal: Healthy Environment

The regional transportation system advances equity and contributes to communities' livability and sustainability while protecting the natural, cultural, and developed environments.

OBJECTIVES

- Reduce transportation-related air emissions.
- Reduce impacts of transportation construction, operations, and use on the natural, cultural, and developed environments.
- Increase the availability and attractiveness of transit, bicycling, and walking to encourage healthy communities and active car-free lifestyles.
- Provide a transportation system that promotes community cohesion and connectivity for people of all ages and abilities, particularly for historically underrepresented populations.

Thrive MSP 2040 Outcomes: Stewardship, Equity, Livability, Sustainability

Goal: Leveraging Transportation Investment to Guide Land Use

The region leverages transportation investments to guide land use and development patterns that advance the regional vision of stewardship, prosperity, livability, equity, and sustainability.

OBJECTIVES

- Focus regional growth in areas that support the full range of multimodal travel.
- Maintain adequate highway, riverfront, and rail-accessible land to meet existing and future demand for freight movement.
- Encourage local land use design that integrates highways, streets, transit, walking, and bicycling.
- Encourage communities, businesses, and aviation interests to collaborate on limiting incompatible land uses that would limit the use of the region's airports.

Thrive MSP 2040 Outcomes: Stewardship, Livability, Sustainability

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Chapter 2: The Region and Travel

Twin Cities Metropolitan Planning Organization Planning Area: Demographics

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, and 184 surrounding communities.

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In 2014, the Metropolitan Council transportation planning area boundary and metropolitan planning organization (MPO) jurisdiction was expanded to encompass portions of Wright and Sherburne Counties. The expansion resulted from the designation of these areas as part of the Minneapolis-St. Paul Urbanized Area by the 2010 U.S. Census.

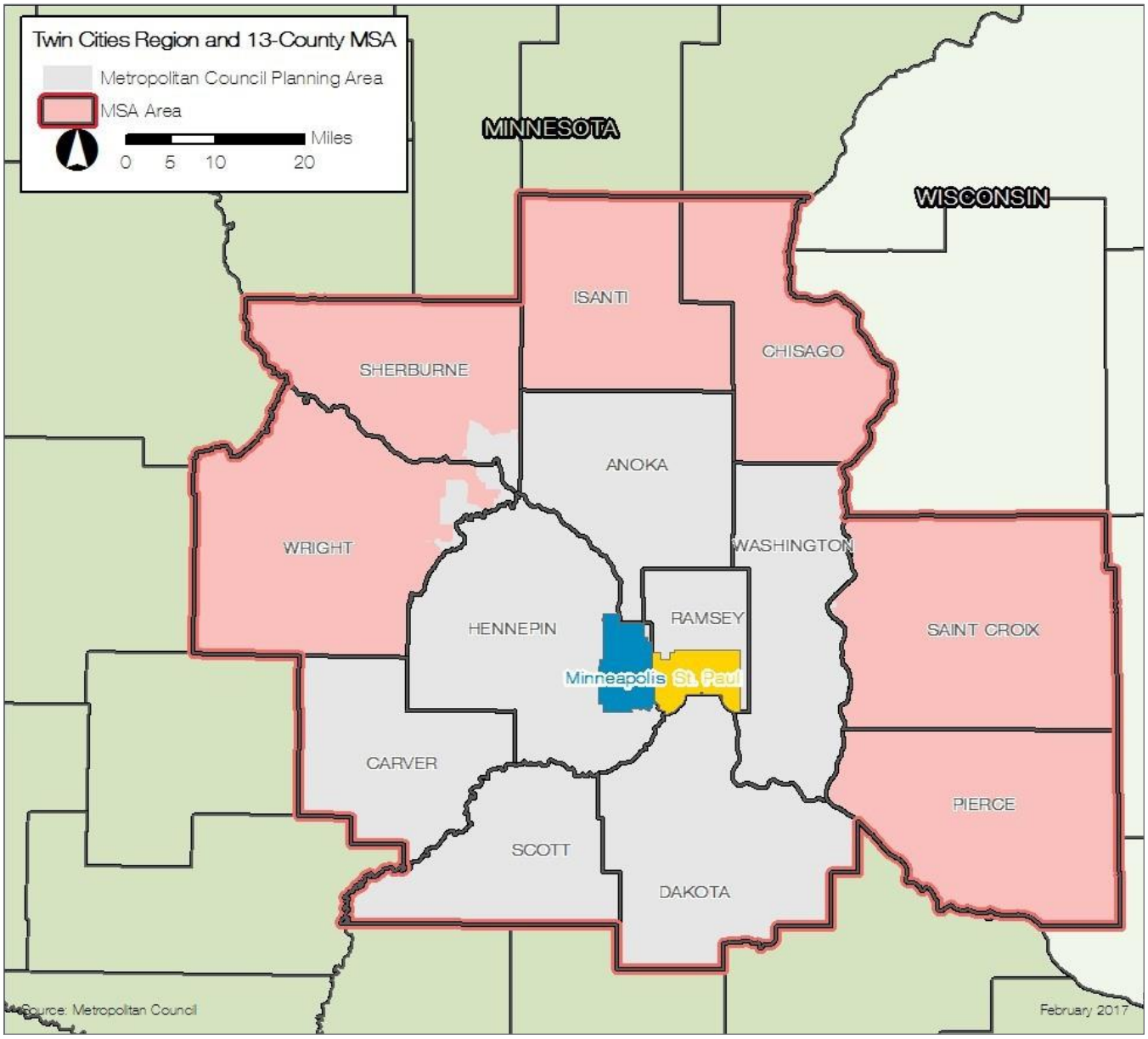
The Transportation System Performance Evaluation (TSPE) now covers the MPO area consisting of the seven counties, as well as portions of Sherburne and Wright Counties. It contains the two central cities of Minneapolis and St. Paul, located respectively in Hennepin and Ramsey Counties. This area will 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 16 counties: the seven counties in the Metropolitan Council region, seven adjacent counties in Minnesota (Chisago, Isanti, Le Sueur, Mille Lacs, Sherburne, Sibley, Wright), and two neighboring counties in Wisconsin (Pierce and St. Croix). **Figure 2-1** shows the TSPE planning area and broader MSA.

The MSA area includes 16 counties: the seven counties in the Metropolitan Council region, seven adjacent counties in Minnesota (Chisago, Isanti, Le Sueur, Mille Lacs, Sherburne, Sibley, Wright), and two neighboring counties in Wisconsin (Pierce and St. Croix).

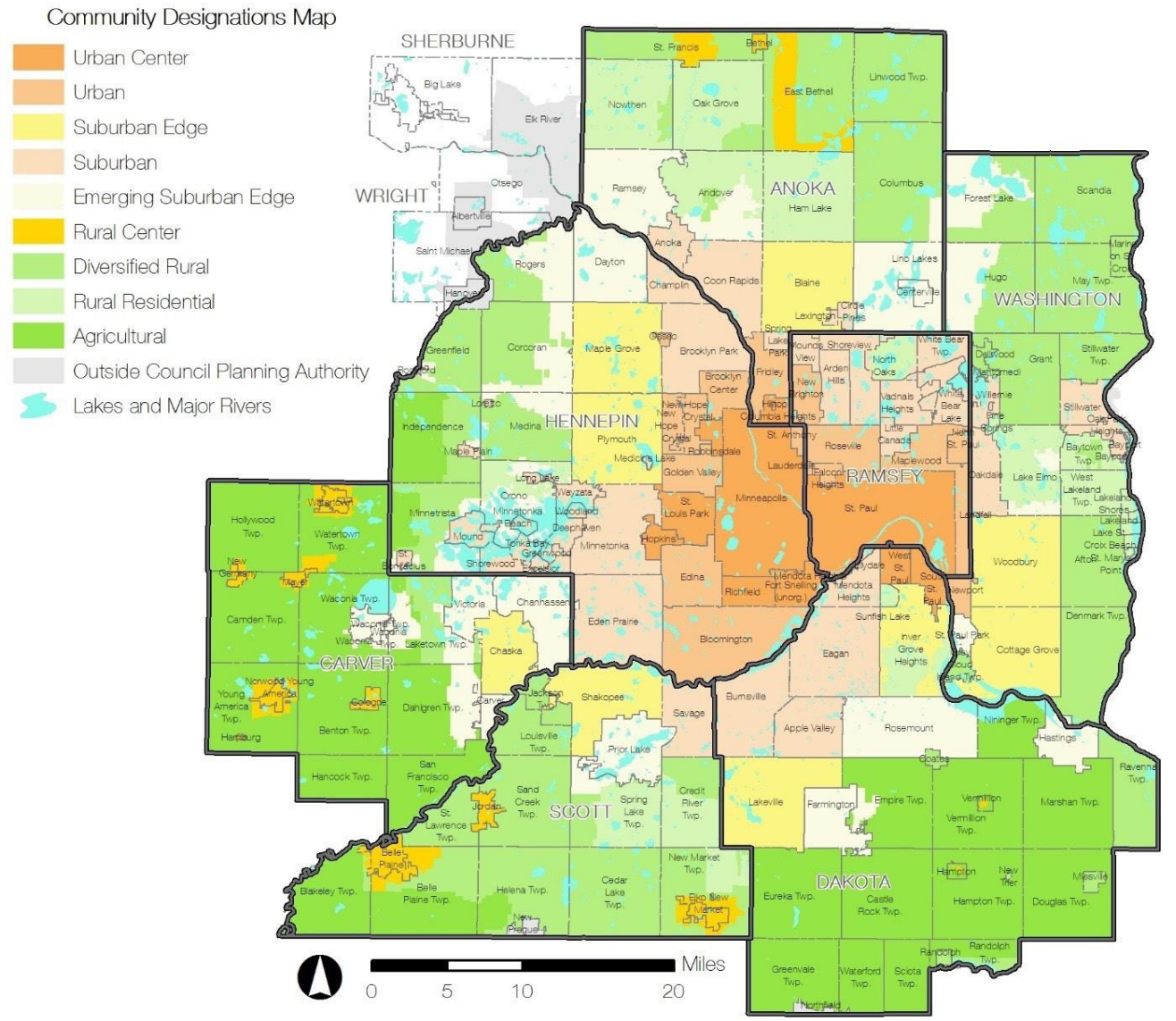
[1] A metropolitan statistical area (MSA) is a US Census definition for an urban area of 50,000 people or more, consisting "of one or more counties and includes the counties containing the core urban area, as well as any adjacent counties that have a high degree of social and economic integration (as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

Figure 2-1: Twin Cities Region and 16-County Metropolitan Statistical Area



Data will also be examined by planning areas identified in the metropolitan development guide. The most-recent metropolitan development guide, Thrive MSP 2040, the umbrella policy plan in the Twin Cities region, was adopted in 2014. Areas with similar development and expected growth patterns were grouped together (developed areas, developing areas, rural residential, etc.) into planning areas, depicted in **Figure 2-2**. Population and employment statistics will be presented for these areas. More information about the development guide can be found at https://metrocouncil.org/Planning/Projects/Thrive-2040.aspx.

Figure 2-2: Thrive MSP 2040 Planning Areas



Source: Metropolitan Council

February 2017

Planning Area Dynamics

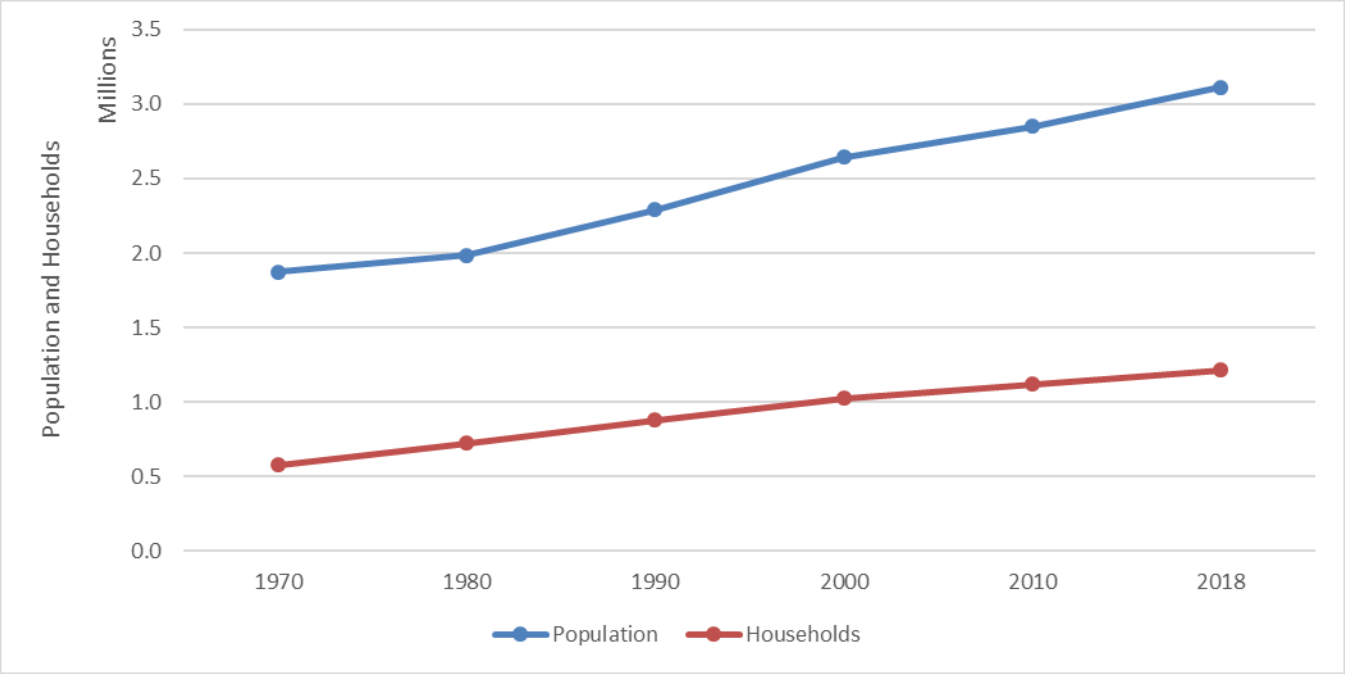
Population Trends

The Twin Cities region has been gaining population and households steadily since 1970. In 2018, the Twin Cities region had 3,113,338 people in 1,213,980 households based on Metropolitan Council estimates.

In 2018, the Twin Cities region had 3,113,338 people in 1,213,980 households based on Metropolitan Council estimates.

In the 1980s and 1990s, the region's population grew 15 percent each decade. However, growth slowed dramatically between 2000 and 2010, to just under 8 percent. Since 2010, population has been growing an average of roughly 1 percent per year compared to a growth rate of approximately 0.8 percent per year between 2000 and 2010. **Figure 2-3** depicts the growth of population and households in the Twin Cities Region.

Figure 2-3: 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 suburbs were 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 during the last 48 years.

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.

The population growth rate in the first-ring area (previously defined as the developed area) slowed between 2000 and 2010. Between 2014 and 2018, the percentage of households by framework area remained relatively constant, with a slight increase in the percentage of households in the suburban edge and emerging suburban edge, and slight decreases in urban and suburban areas and urban centers. **Figure 2-4** shows the distribution of households by framework area in the seven- county area (excluding the additional extended areas of Sherburne and Wright Counties, where data is unavailable).

Figure 2-4: Percent Households by Framework Area

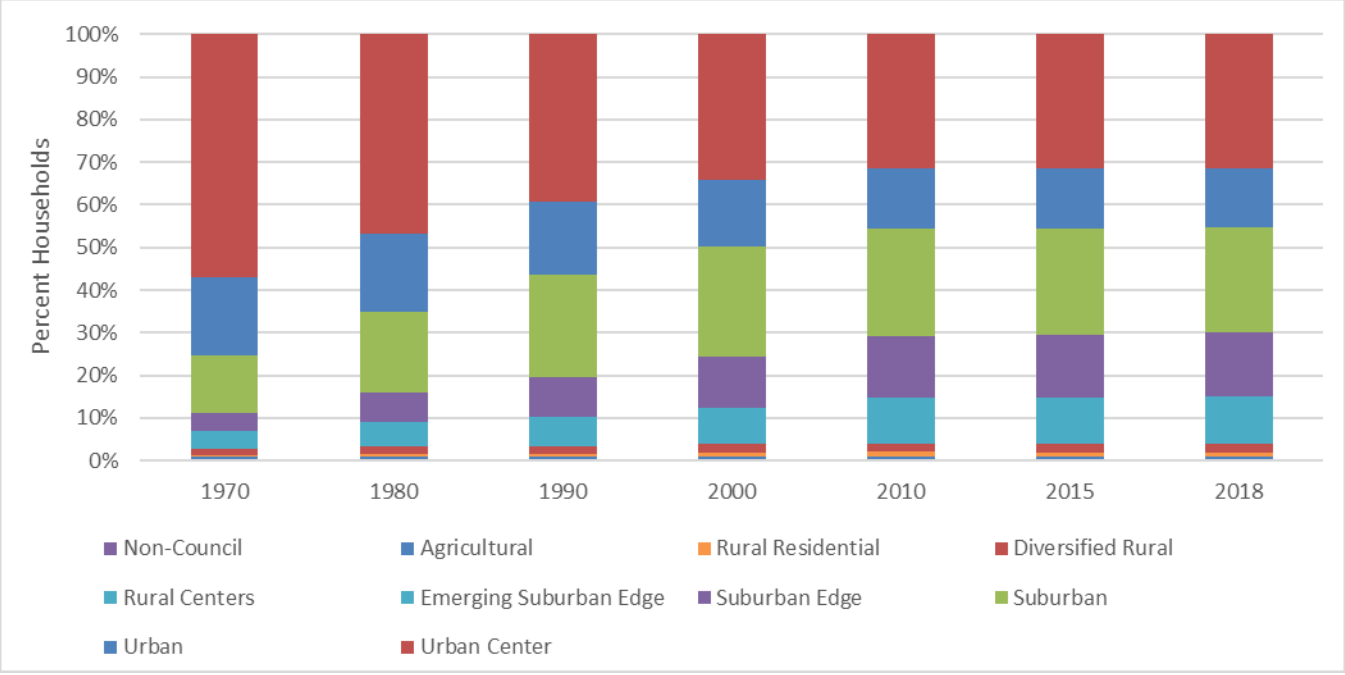
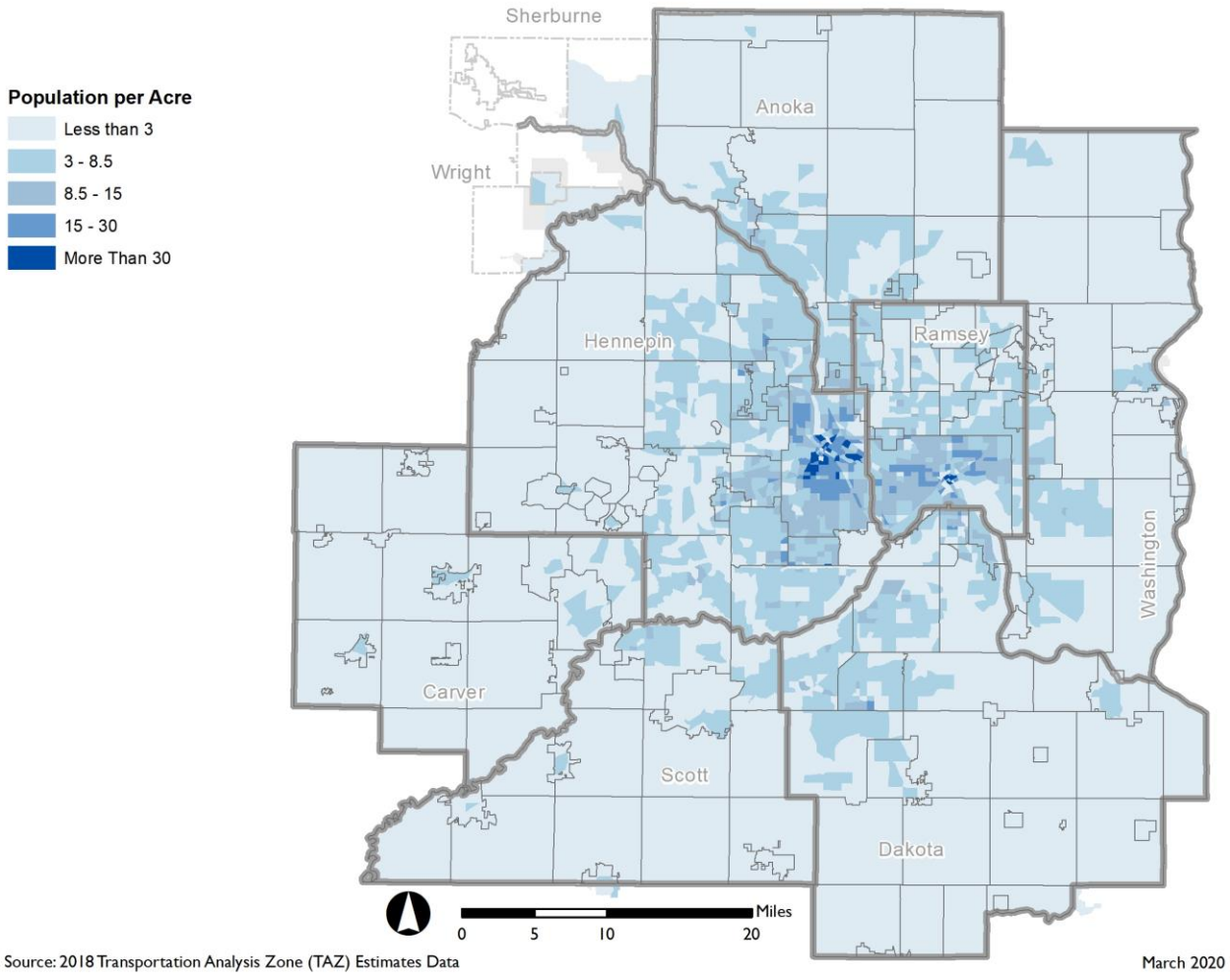


Figure 2-5 shows the current population density in the Twin Cities region, mapped based on 2018 Transportation Analysis Zone (TAZ) data. With recent high-rise condominium and infill development, the downtown areas of Minneapolis and St. Paul are the densest areas of population in the region. The central cities 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.

Figure 2-5: 2018 Population Density of Twin Cities Region



Household Size

In the Twin Cities region, the 2000 to 2014 growth of households outpaced the growth of population, 14.4 percent to 12.8 percent respectively, adding 144,201 households and 337,281 people. Based on Metropolitan Council estimates, from 2014 to 2018, growth in population outpaced the growth in households for the seven-county region. Over this period, the population increased by 133,995 people, or 4.5 percent, and the number of households increased by 48,323, or 4.1 percent. This yields an average household size of 2.56, an increase from 2.55 for the seven-county Twin Cities region according to the 2014 Metropolitan Council Estimates. From 2000 to 2013, the percentage of one-person households increased slightly from 27.5 percent of households to 28.5 percent of households. ACS data suggests that the number of one-person households has remained approximately unchanged, with a very slight increase to 28.6 percent from 2013 to 2017.

Based on Metropolitan Council estimates, from 2014 to 2018, growth in population outpaced the growth in households for the seven-county region.

Population Age

In 2013, 27.3 percent of the Twin Cities region was aged 0 to 19 years, 61.5 percent was aged 20 to 64 years, and 11.2 percent were over 65 years. The median age was 35.6 in 2013. According to the American Community Survey, the region is aging slightly. In 2017, the Twin Cities region was 26.3 percent aged 0 to 19 years, 61.1 percent aged 20 to 64 years, and 12.6 percent were over 65 years. The median age in 2017 was 37.2 years.

According to the American Community Survey, the region is aging. The median age was 35.6 in 2013 and 37.2 in 2017.

Employment Trends

Twin Cities employment did not escape the impact of the national recession at the end of 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.

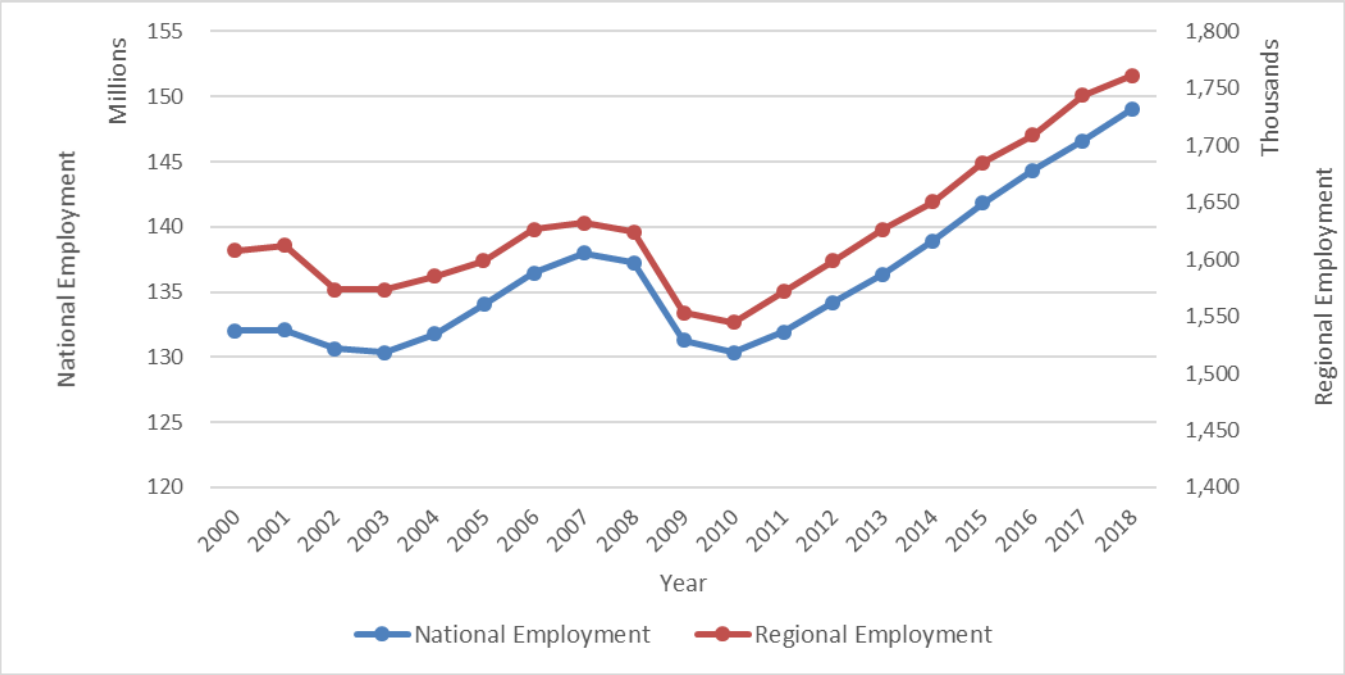
The economy did not experience a consistent trend of decline over the last 18 years but had several periods of recession and recovery. Regional employment peaked in 2001. A national recession soon followed, causing job losses. The 2001 levels were not matched again until 2005 (See **Figure 2-6**). The region continued to gain jobs until 2007, but another recession caused extensive job losses in 2009 and 2010. These up and down cycles resulted in a total loss of 65,000 jobs between 2000 and 2010.

Since 2010, regional employment has increased each year coming out of the recession, first surpassing 2007 levels in 2013. According to the Bureau of Labor Statistics, the Twin Cities region has added over 111,000 new non-farm jobs since 2014.

The regional employment trends were comparable to the national trends. Both regionally and nationally, pre-recession employment peaked in 2007, with lowest levels observed in 2002 and 2010. National employment has also increased since 2010, first surpassing 2007 levels in 2014. **Figures 2-6** illustrate these regional and national trends, respectively.

Since 2010, regional employment has increased each year coming out of the recession, first surpassing 2007 levels in 2013.

Figure 2-6: Regional and National Employment 2000-2018



Data for Minneapolis-St. Paul-Bloomington, MN-WI combined statistical are

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 that period, adding more than 74,000 jobs.

Education and health services were t/he only industries to have major gains in employment over the 2000 to 2010 period, adding more than 74,000 jobs.

According to 2018 Bureau of Labor Statistics data, the three largest non-farm employment sectors in the Twin Areas were (including: Sherburne, Wright, Mille Lacs, Isanti, Chisago, Le Sueur, Sibley Counties in Minnesota, and St. Croix and Pierce Counts in Wisconsin):

- Trade, transportation, and utilities (361,700 jobs)
- Education and health services (337,000 jobs)
- Professional and business services (325,900 jobs)

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 level

s.

In addition to downtown Minneapolis and St. Paul, there are several other large job clusters located along major highway corridors, especially in the southwest quadrant of the region.

Figure 2-7 shows the current employment density in the Twin Cities region, mapped based on 2018 TAZ data.

Figure 2-7: Employment Density of The Twin Cities Region

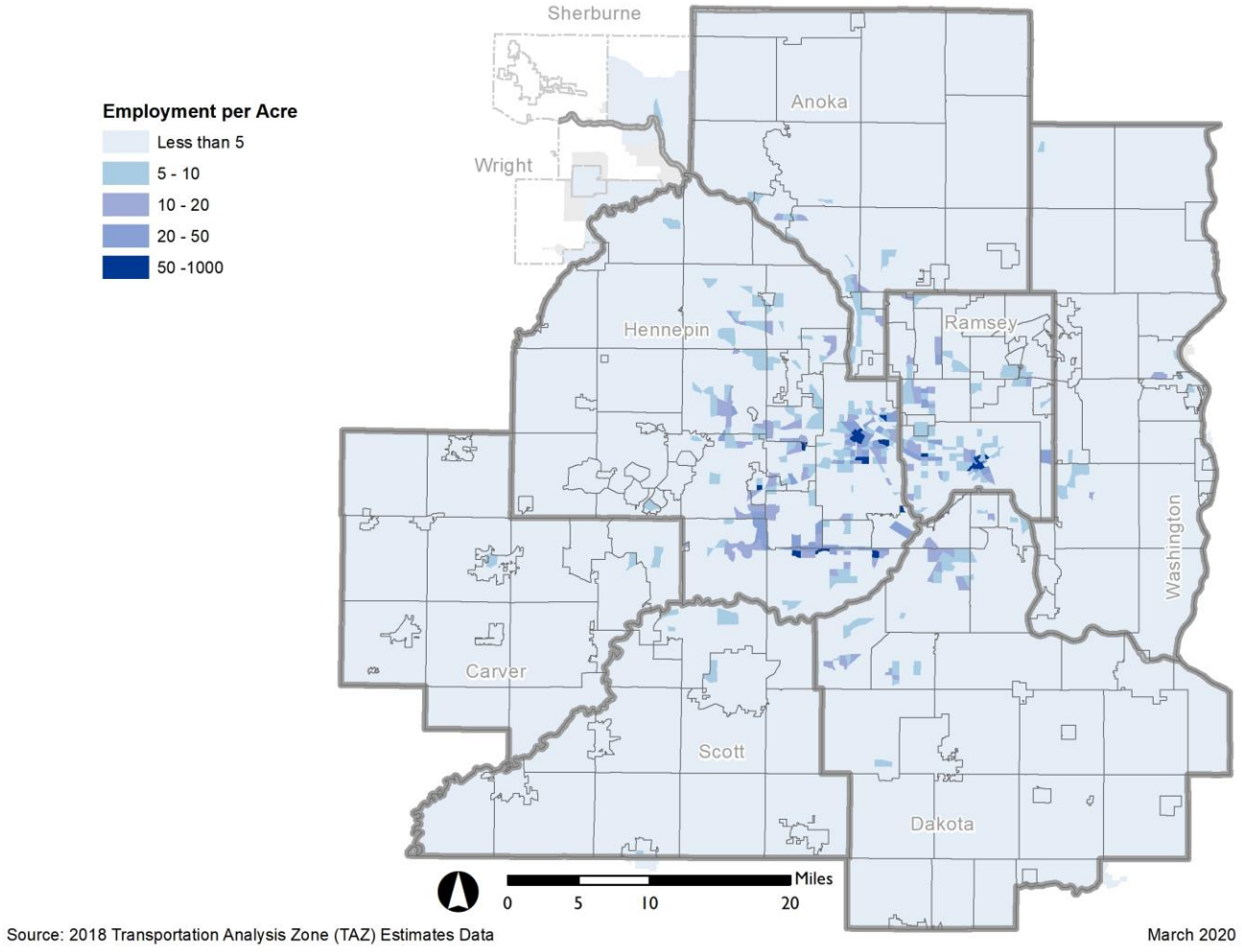
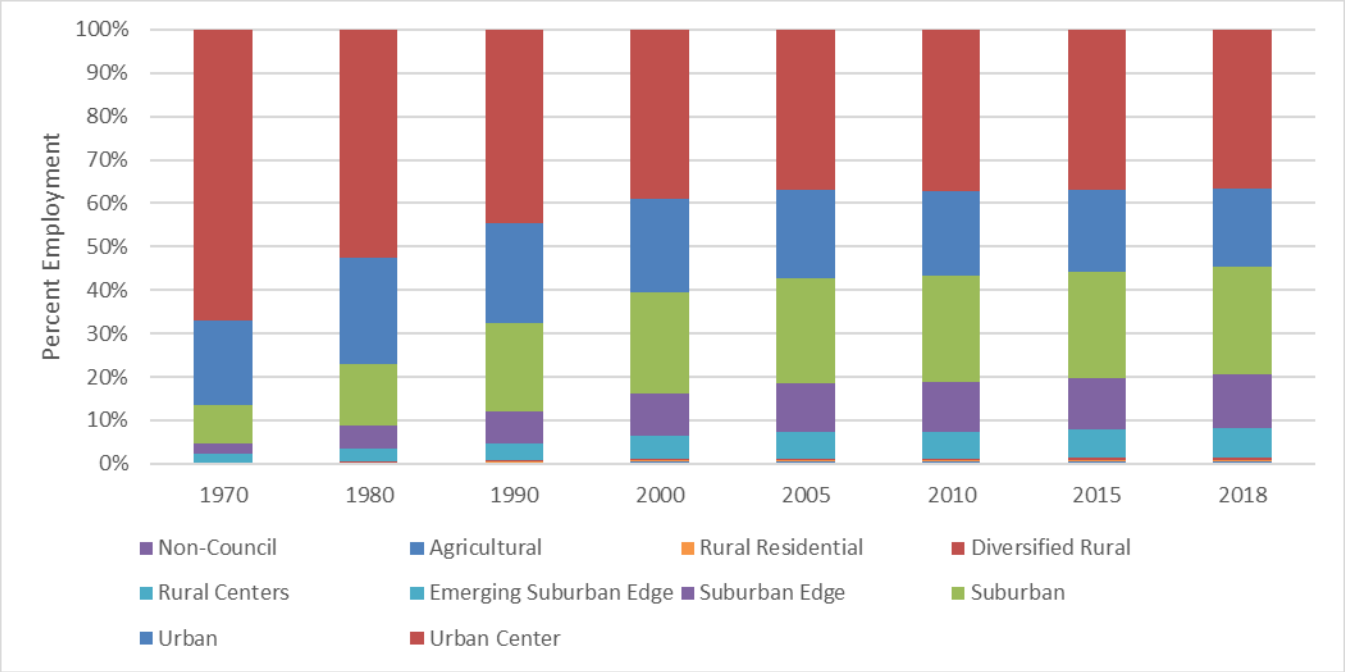


Figure 2-8 shows the breakdown of employment by framework area in the seven-county area (excluding the additional extended areas of Sherburne and Wright Counties, where data is unavailable). From 2000 to 2018, employment fell 2 percent in urban centers, while increasing 2 percent in the suburban edge and emerging suburban edge. Over 43 percent of jobs in the region are in suburban areas, compared to just below 55 percent in urban areas.

Figure 2-8: Percent Employment by Framework Area



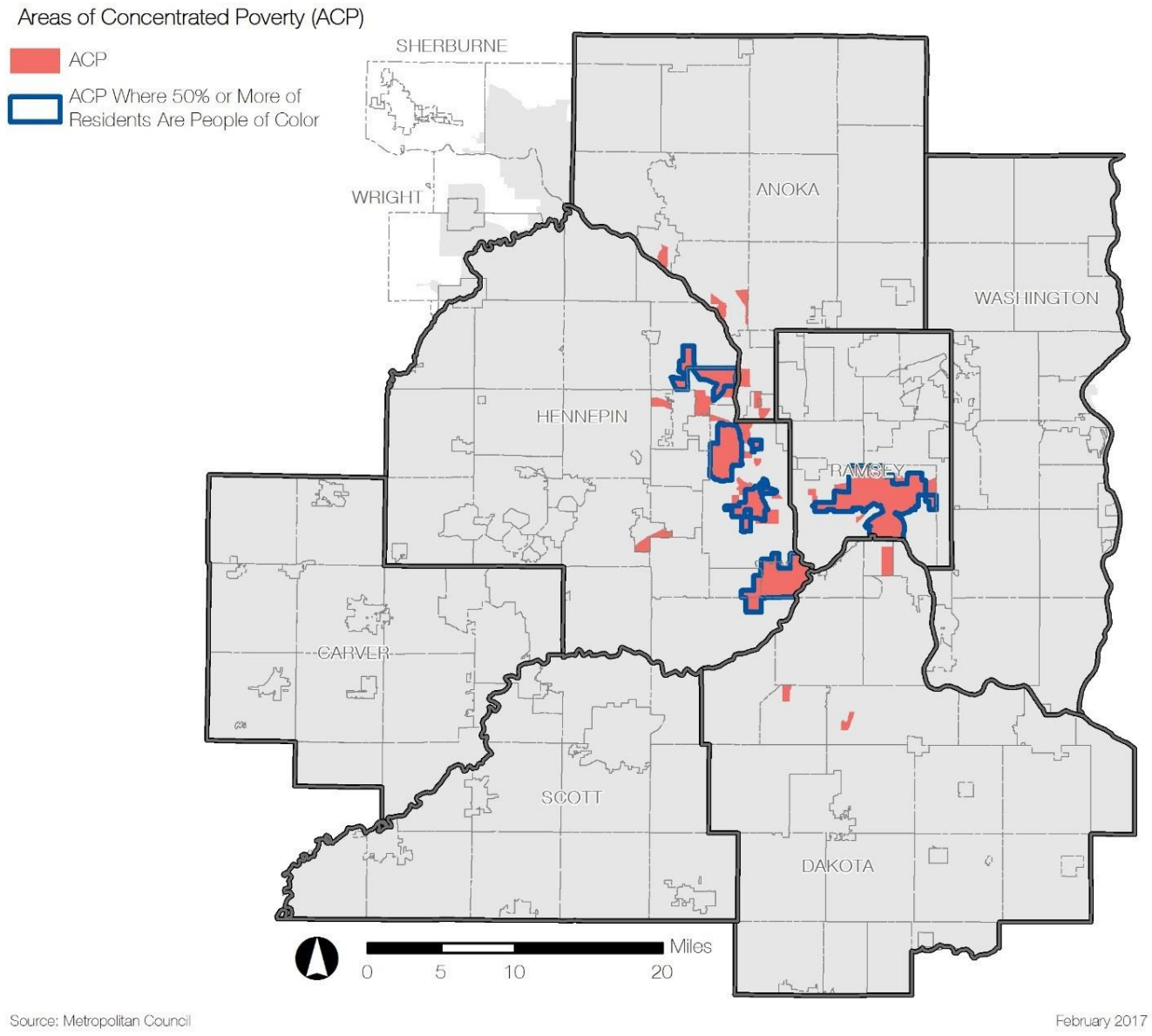
Regional Income and Areas of Concentrated Poverty

Median household income in the region was $65,181 in 2010. According to 2013-2017 ACS 5-Year Estimates, the average median household income in the seven-county region was $80,584. The extended planning area including the portions of Sherburne and Wright Counties had an average median household income of $87,819. This is well above the national median household income of $57,652. 18

Approximately 10 percent of the region's households were considered in poverty by federal standards, compared with 14.6 percent nationally. **Figure 2-9** on the following page depicts areas of concentrated poverty in the region, as well as areas of concentrated poverty where 50 percent of the residents are people of color. These are census tracts where 40 percent or more of the residents live in poverty. As of 2018, nearly 350,000 residents live in the region's areas of concentrated poverty.

Approximately 10 percent of the region's households were considered in poverty by federal standards, compared with 14.6 percent nationally. As of 2017, nearly 350,000 people live in the region's areas of concentrated poverty.

Figure 2-9: Areas of Concentrated Poverty



Land Use and Transportation Relationship

There is an important relationship between the characteristics of land use and development and travel trends of the region. Thrive MSP 2040 designated planning areas by community types based on similar issues facing them in planning for the future, but they also represented similar characteristics in how the communities have developed to date. **Figure 2-10** shows that as community types from Thrive MSP 2040 become less dense, their households typically produce more vehicle miles traveled. This is both a result of their development patterns and their location relative to the region's center. Similarly, **Figure 2-11** shows a pattern of less transit use by commuters as density decreases. This is also a factor of transit availability that generally relates to a community's transit market potential, although commuters in most communities also have access to park-and-ride facilities.

There is an important relationship between the characteristics of land use and development and travel trends of the region.

The relationship of land use and vehicle miles traveled is important because vehicle miles traveled are highly correlated with several other important outcomes of transportation. As vehicle miles traveled increases, these measures also generally increase:

- Number of crashes, and fatalities and serious injuries resulting from crashes
- Levels of congestion and travel delay
- Vehicle emissions for pollutants and greenhouse gases
- Wear and tear on pavement and bridge quality

The relationship of land use and vehicle miles traveled is important because vehicle miles traveled are highly correlated with several other important outcomes of transportation. As vehicle miles traveled increases, so does number and severity of crashes, level of congestion and delay, vehicle emissions, and impact on pavement and bridge quality.

Figure 2-10: Population Density and Vehicle Miles Traveled from Regional Travel Demand Model

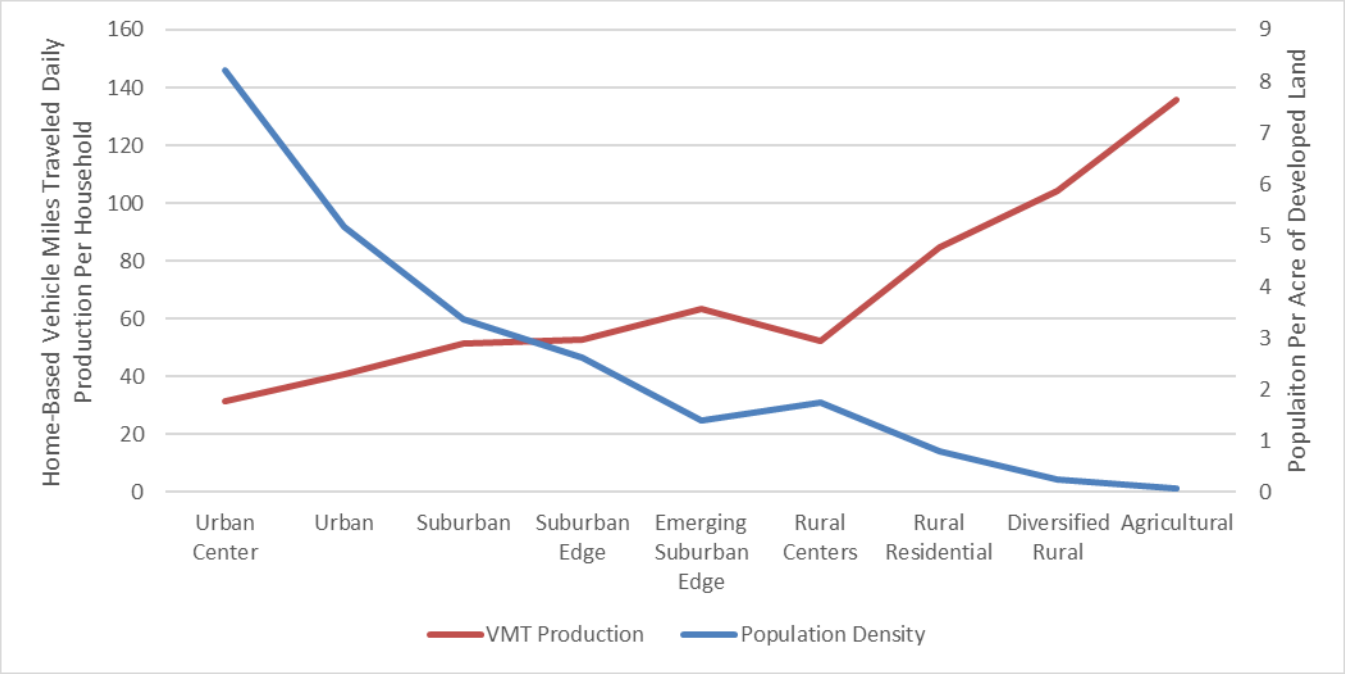
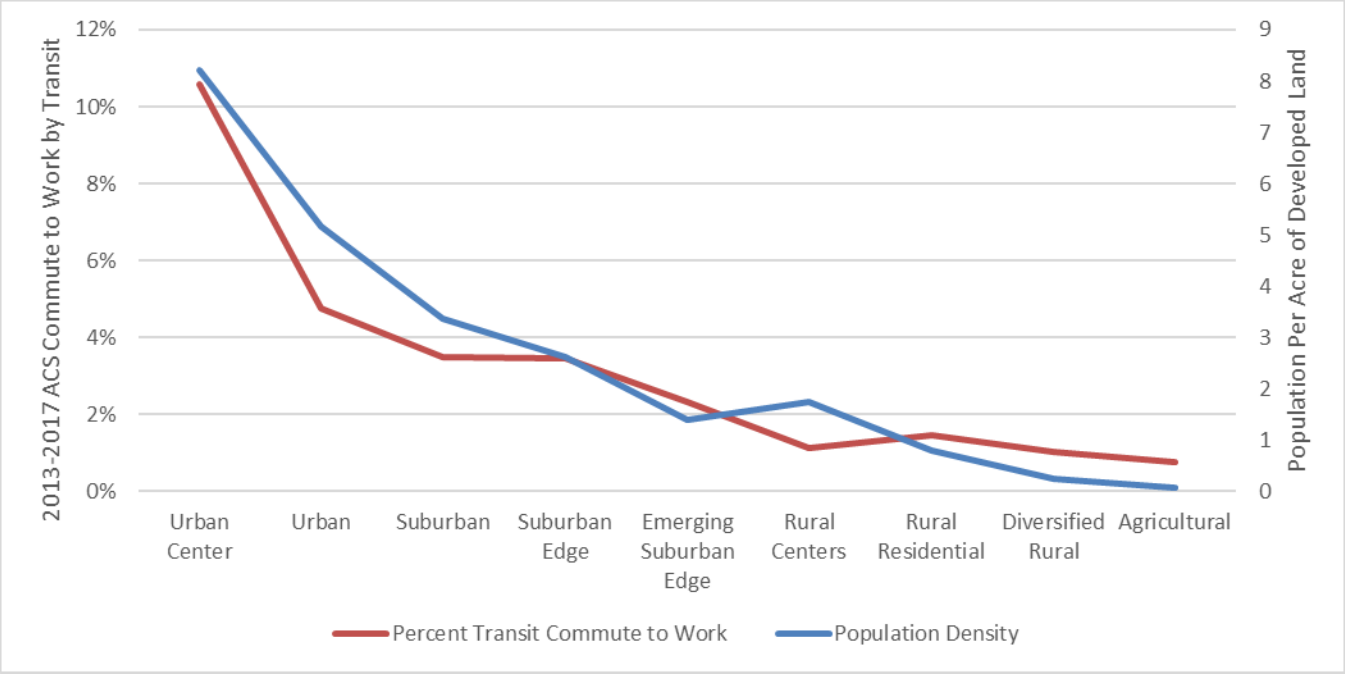


Figure 2-11: Population Density and Transit Use



Cost of Transportation

According to Center for Neighborhood Technology figures, the average annual vehicle miles traveled per household in the Twin Cities is 20,991 miles. The cost of transportation by itself, and as a percent of income for a typical household in the region is an important metric in assessing the affordability and accessibility of travel options for residents. Transportation costs include automobile ownership costs, automobile use costs (e.g. fuel), and transit use costs. In the Twin Cities, the average annual transportation cost is $13,430, or an average of 20 percent of total median household income.

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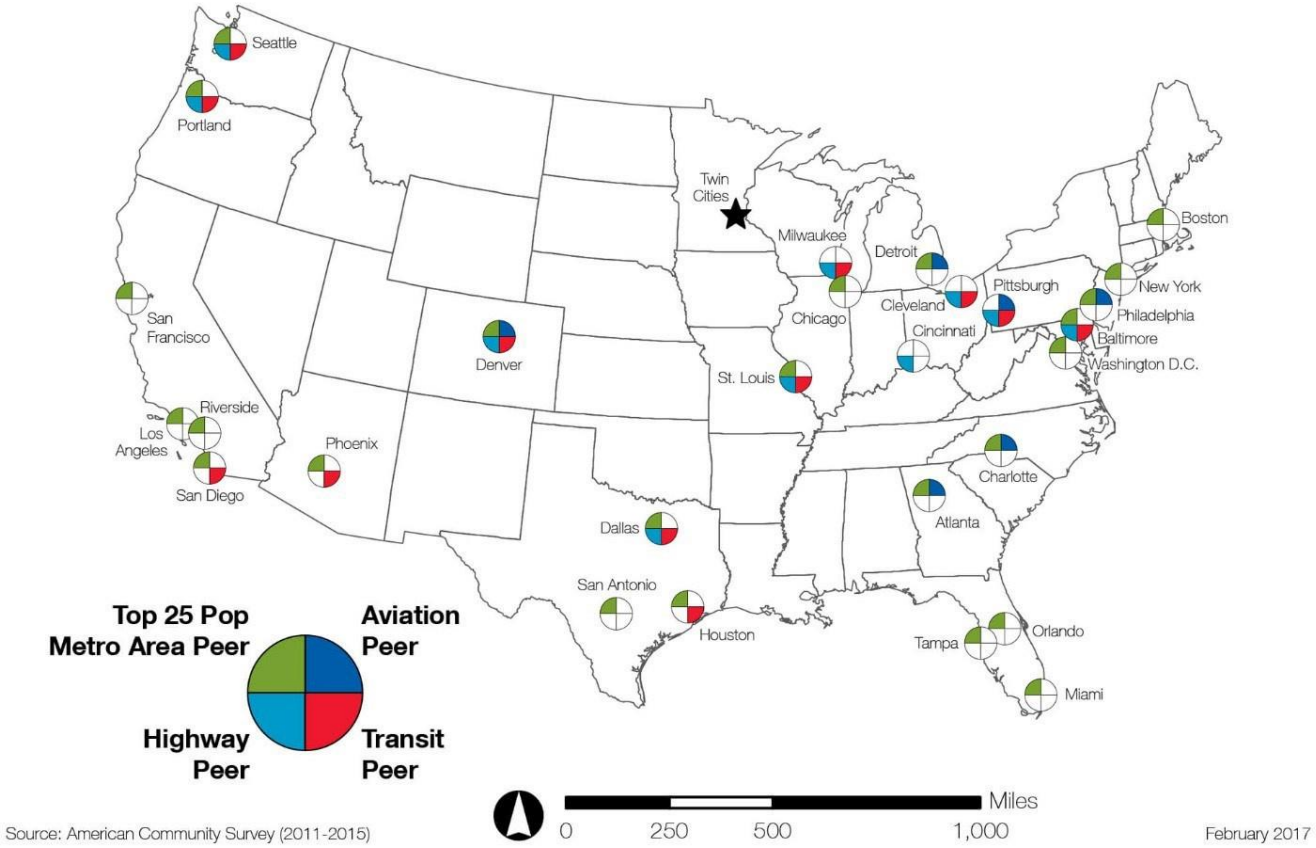
How the Twin Cities Compares with Peer Regions

Introduction

Information is presented in this chapter, where available, for the planning area (Twin Cities region), as well as for the larger MSA used for comparing to peer regions. The main demographic peer regions used for comparison are the 25 most populated MSAs in the United States. The chapters for each transportation mode, which make up most of this plan, will use different sets of peer regions to compare each modal system. Peer groups will be defined in greater details in those chapters. **Figure 2-12** includes the peer regions used for comparison in this chapter.

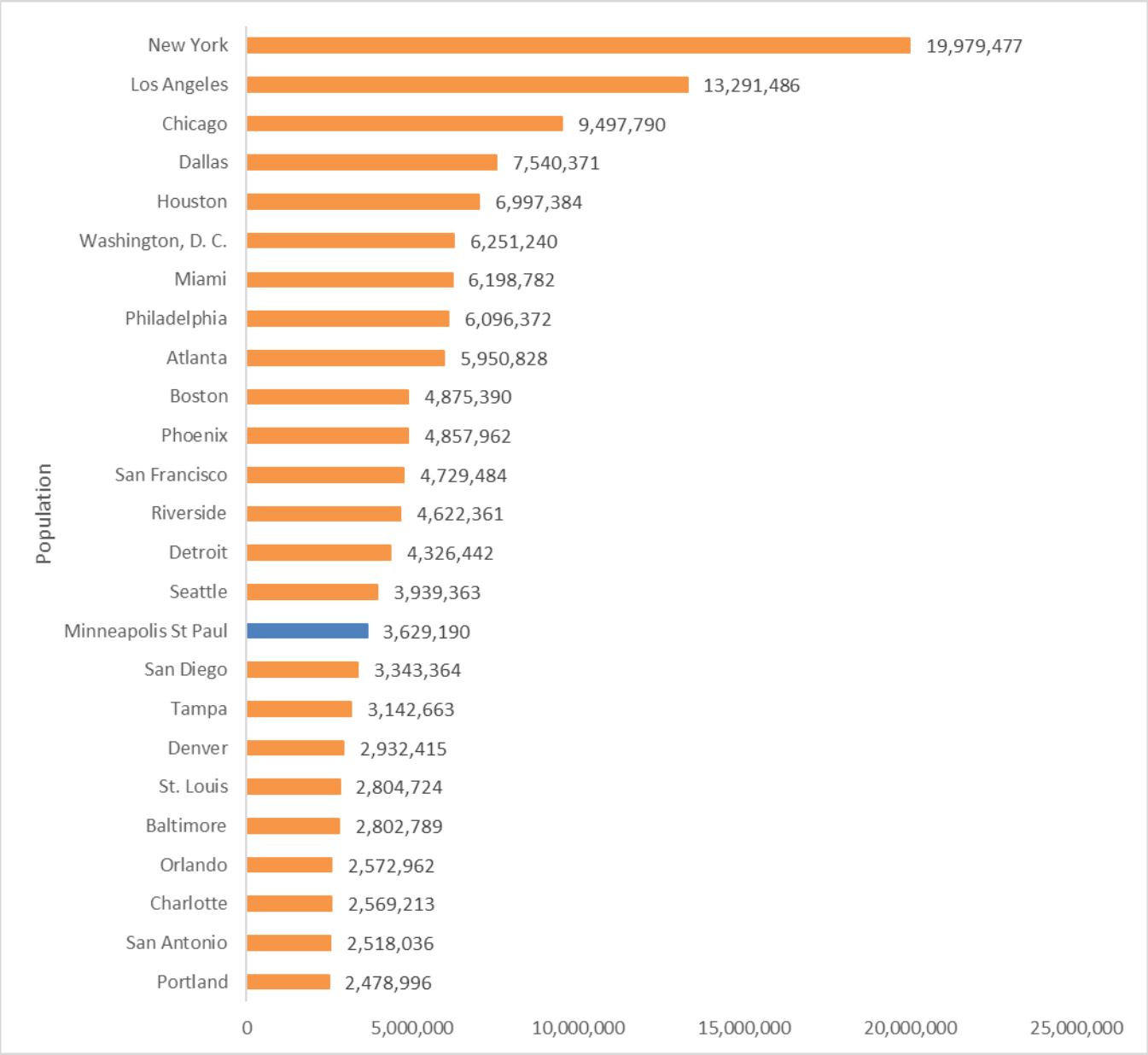
Figure 2-12: Peer MSA Regions



Population

Of the 25 peer regions, the Twin Cities MSA ranks 16th for total population, as shown in **Figure 2-13**. Between 2014 and 2018, all peer regions except Chicago gained population. The Twin Cities MSA population increase of 3.9 percent, was below the peer average of 4.5 percent. The seven-county region experienced slowing growth from 2014 to 2018 like the Twin Cities MSA

Figure 2-13: Peer Regions (Top 25 MSAs by Population) Ranked by 2018 Population



Age

The elderly population in the Twin Cities MSA is growing. In 2013, 9.5 percent of the MSA population was older than age 65. In 2017, 12.6 percent of the MSA population was older than age 65. This is still significantly less than the 2017 national average of 14.9 percent and peer region average of 13.6 percent.

The elderly population in the Twin Cities MSA is growing. This is still significantly less than the 2017 national average of 14.9 percent and peer region average of 13.6 percent.

The Twin Cities MSA is slightly below average for percentage of population within working age (15-64-year olds), ranking 16th among its peers. About 67 percent of the MSA population is within this age range.

Unemployment

The Twin Cities MSA had 4.3 percent unemployment in 2017, according to 2017 American Community Survey data. This is down from 7.4 percent in 2013. Among peer regions, the Twin Cities MSA unemployment rate ranked second lowest in 2013 and was the lowest of all peer regions in 2017.

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Household Income

The Twin Cities MSA ranked 6th highest among peer MSAs by median household income in 2017, with a value of $73,735. This is a 4.9 percent increase from the Twin Cities MSA median household income in 2013, when it also ranked 6th among peer regions. The average median household income among peer regions (excluding the Twin Cities MSA) is $66,387, an increase of 4.7 percent since 2012. Nationally, the median household income is $57,652.

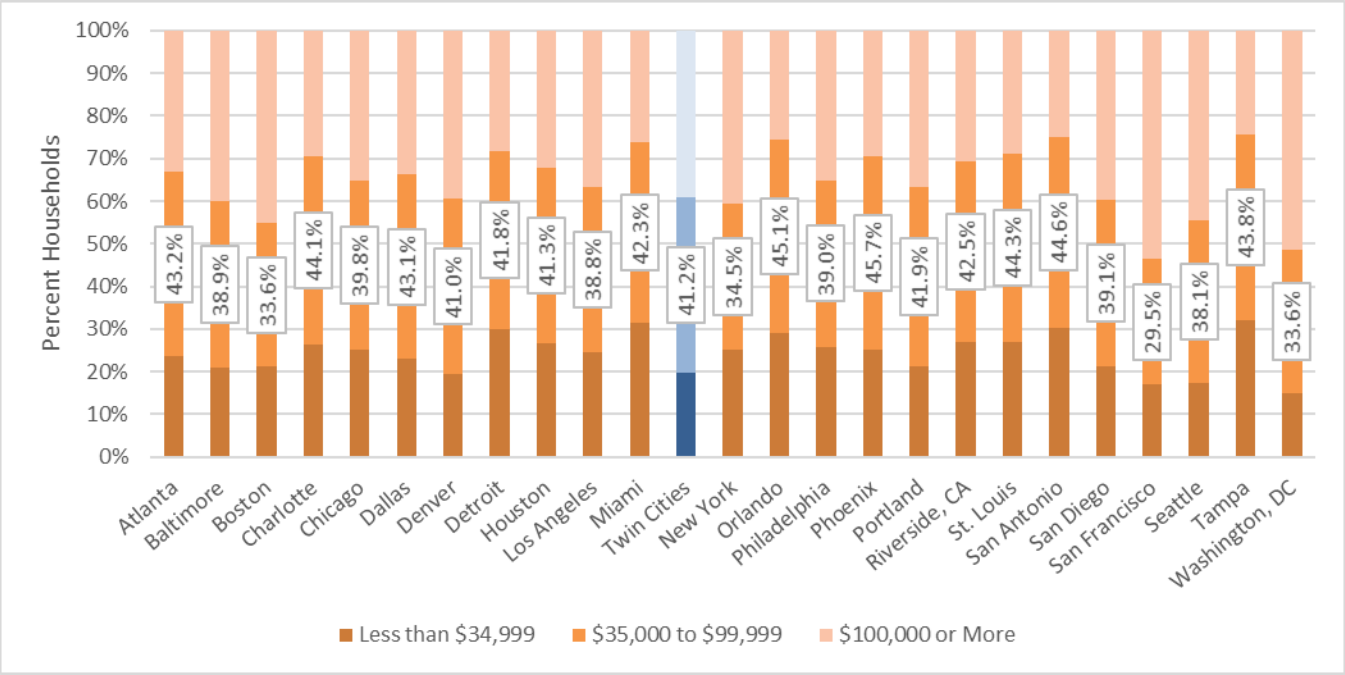
The Twin Cities MSA ranked 6th highest among peer MSAs by median household income in 2017, while the region ranks 10th for total population.

The percentage of middle-income households is one measure of the economic health and stability of a region. The Twin Cities MSA ranks fourteenth among peer regions for largest set of middle-income households, with 41.2 percent of households earning between $35,000 and $99,999 annually. This is above the peer average (excluding the Twin Cities MSA) of 40.4 percent, and the national value of 43.0 percent. Additionally, 39 percent of households in the Twin Cities MSA have a household income of greater than $100,000. This is 9th highest among peer regions.

The percentage of middle-income households in the Twin Cities MSA decreased by 9.3 percent since 2013. All peer regions saw decreases from 2013 to 2017. Nationally, there was a slight decrease of 1.6 percent since 2013.

Figure 2-14 depicts households in various income groups for the peer regions, according to 2018 American Community Survey data.

Figure 2-14: Households by Low, Middle, High Income Groups



Poverty

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

The Twin Cities MSA has lower than average poverty but it is increasing at a greater than average rate. In 2010, it had risen to 4th lowest poverty rate.

In the Twin Cities MSA, 12.9 percent of households make less than $25,000 per year, according to 2018 American Community Survey data, which is below the Federal household poverty level for a family of four. The Twin Cities MSA has a lower than average poverty level at 9.4 percent.

The average poverty rate among peer regions (excluding the Twin Cities MSA) is 13.25 percent of people below the poverty.Mod

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 2017, 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 81.6 percent, and is well above the peer average of 73.3 percent of women participation in the workforce.

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How the Region Moves: Multimodal Transportation

The most comprehensive source of local data on transportation in the region comes from the Travel Behavior Inventory household survey (TBI). The TBI household survey consists of a travel diary combined with questions to gather key demographic data, including age, employment, and household structure. From 1949 to 2019, the TBI was conducted roughly every 10 years. In 2019, the Council began collecting TBI data every other year. Current TBI data is from 2019

Alongside the economic recovery, travel increased from 2010 to 2019. For instance, the total number of vehicle trips increased from 6.3 million per weekday in 2010 to 7.8 million in 2019, slightly more than the number of vehicle trips made prior to the recession, in 2000 (7.8 million). In keeping with previous results, driving remains the most common way of getting around: the vast number of trips in 2019 were made in a private vehicle (85 percent), with another 0.3 percent occurring in for-hire vehicles. Non-driving modes of transportation accounted for 14.9 percent of trips, which has increased from 11.2 percent of trips in 2010.

Alternate modes of transportation accounted for 14.9 percent of trips in 2019, which has increased from 11.2 percent of trips in 2010.

Table 2-1 depicts the percent of trips by each mode in 2019.

Table 2-1: 2019 Share of Trips by Mode

Mode Type	% of Trips
Drive alone	45
Drive with passengers	18
Ride as passenger	21
Walk	9
Public Transit	3
Bike	1
School bus	1
Other	2

Travel Statistics

Daily Trips

From 1949 (the year of the first TBI survey) until 2000, **Figure 2-15** shows daily trips were increasing. The rate of increase accelerated between 1980 and 2000, putting more demand on the transportation system. The 2010 TBI showed a marked difference – trips had decreased for the first time since the start of the TBI. In 2019, the total number of trips rebounded to pre-recession levels.

Additionally, falling for the first time in recent decades, the daily motorized trips per capita went from 4.1 in 2000 to 3.1 in 2010 (see **Figure 2-16**). The increase in unemployment is one major explanation for fewer daily trips in 2010. In 2019, daily trips per capita had rebounded somewhat to 3.6 motorized trips per person per weekday.

Figure 2-15: Trends in Daily Trips, MPO Area

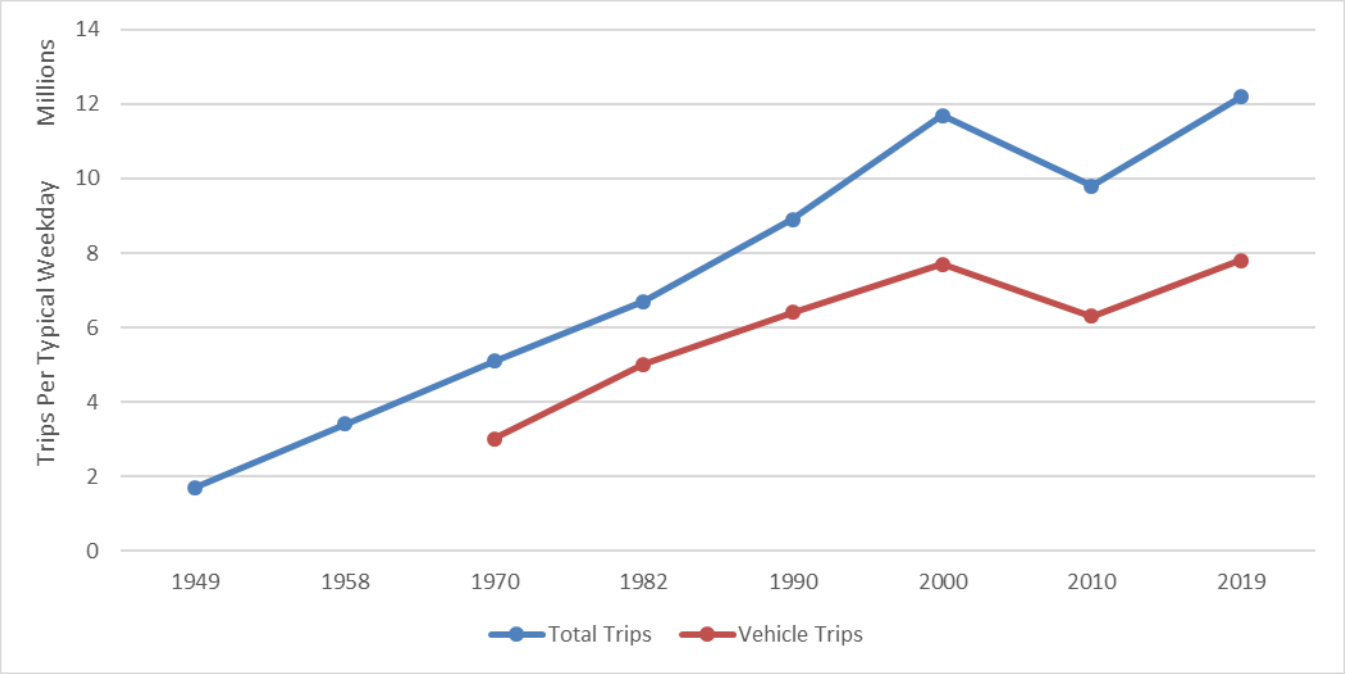
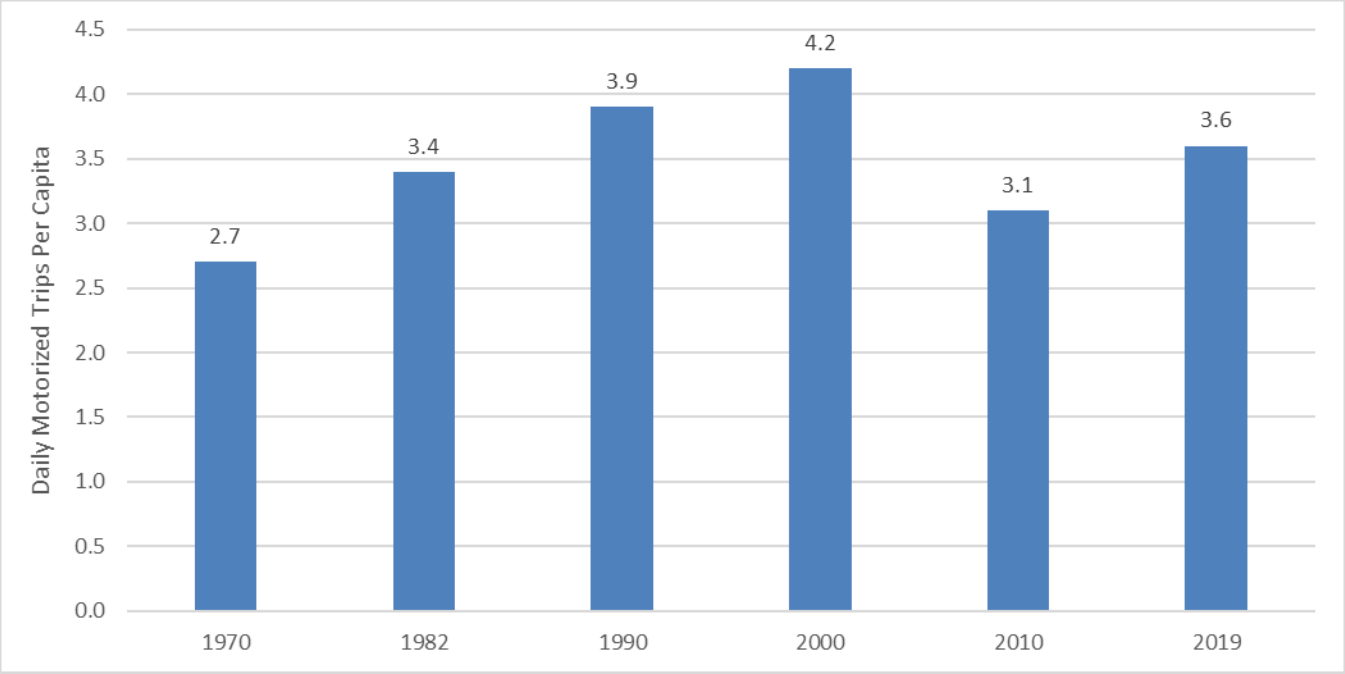


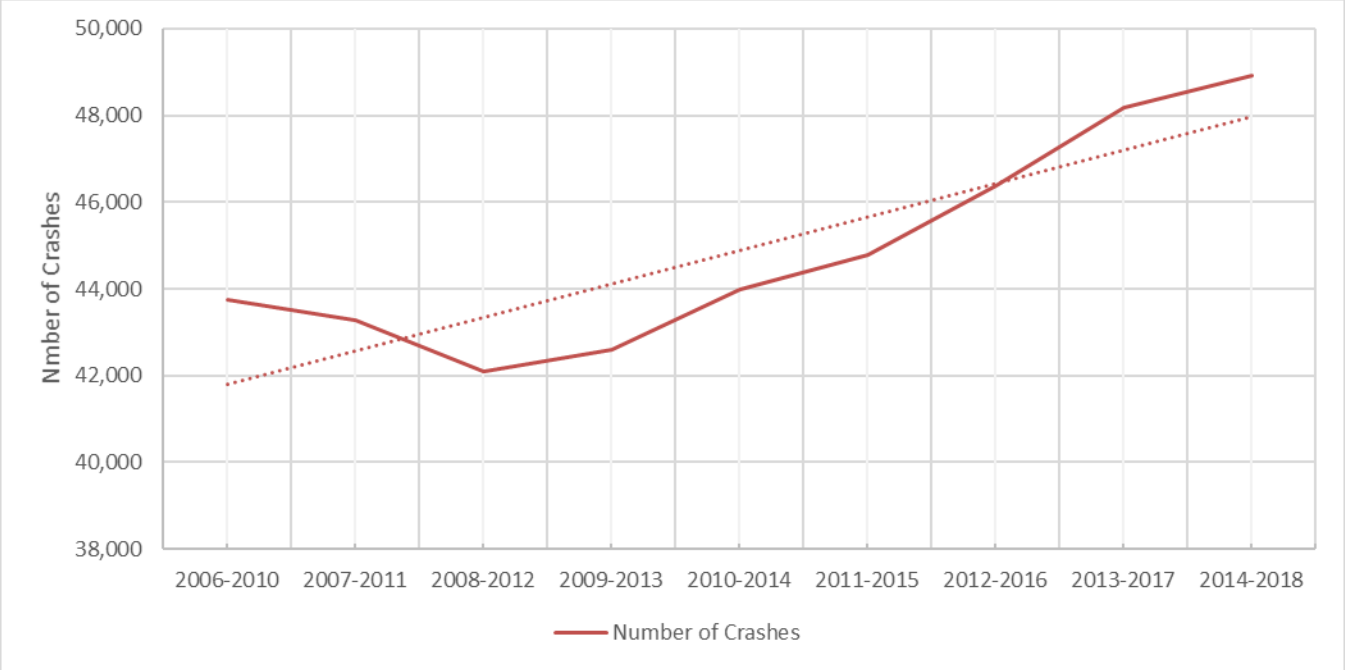
Figure 2-16: Daily Motorized Trips Per Capita



Crashes

The total number of crashes within the Twin Cities region decreased during the recession, but **Figure 2-17** shows the 5-year rolling average number of crashes increased between 2012-2016 and 2014-2018. The five-year rolling average number of crashes was approximately 49,577 crashes per year for the 2014-18 period, up by 13 percent compared to the 2010-14 five-year period.

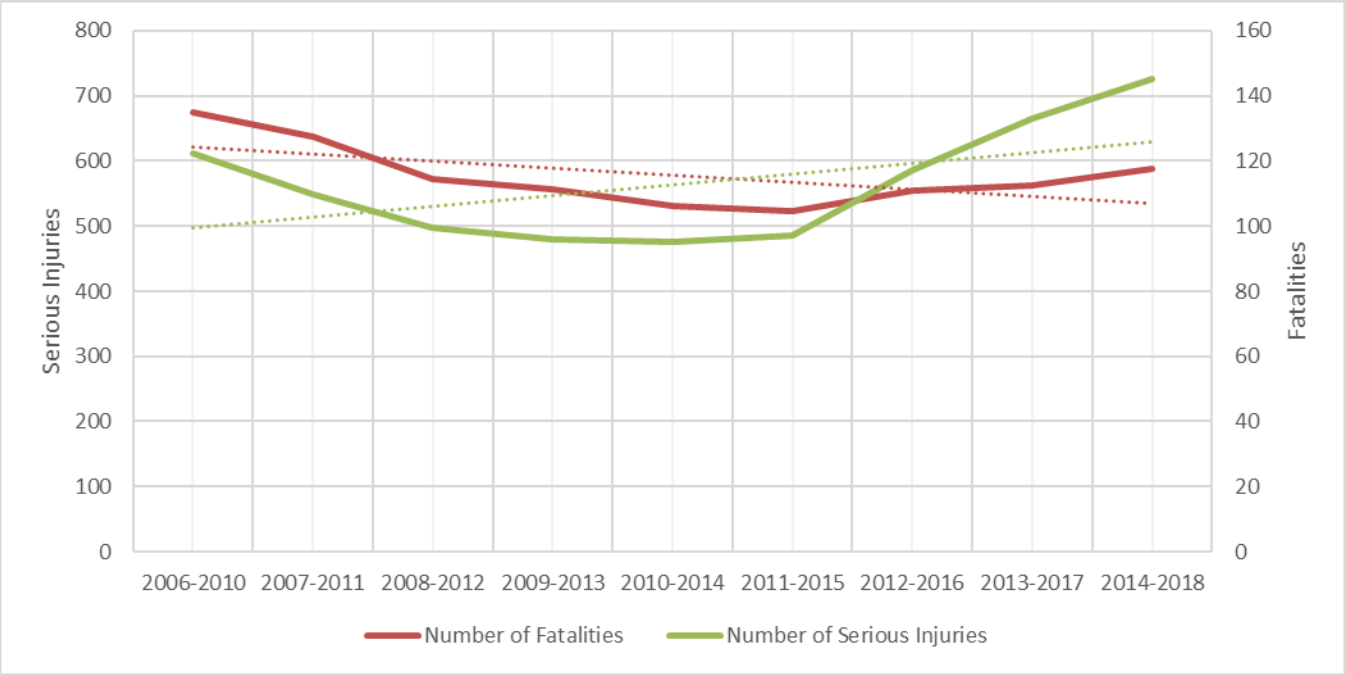
Figure 2-17: Annual Number of Crashes (Five-year Rolling Average), with Linear Trend line



Serious Injuries and Fatalities

Although the total number of crashes and serious injuries within the Twin Cities region has increased in recent years, the total number of fatalities has had less variation, as shown in **Figure 2-18**. The five-year rolling average number of serious injuries was approximately 726 serious injuries per year for the 2014-18 period, up by 52.7 percent compared to the 2010-14 five-year period. The five-year rolling average number of fatalities was approximately 118 fatalities per year for the 2014-18 period, up by 2.4 percent compared to the 2010-14 five-year period.

Figure 2-18: Total Number of Fatalities and Serious Injuries (Five-Year Rolling Average), with Linear Trend Lines



Vehicle Miles Traveled Per Person

According to the Texas Transportation Institute's (TTI) Urban Mobility Scorecard, the number of vehicle miles traveled and the number of trips per person increased between 2014 and 2018. More information is available in the highway chapter.

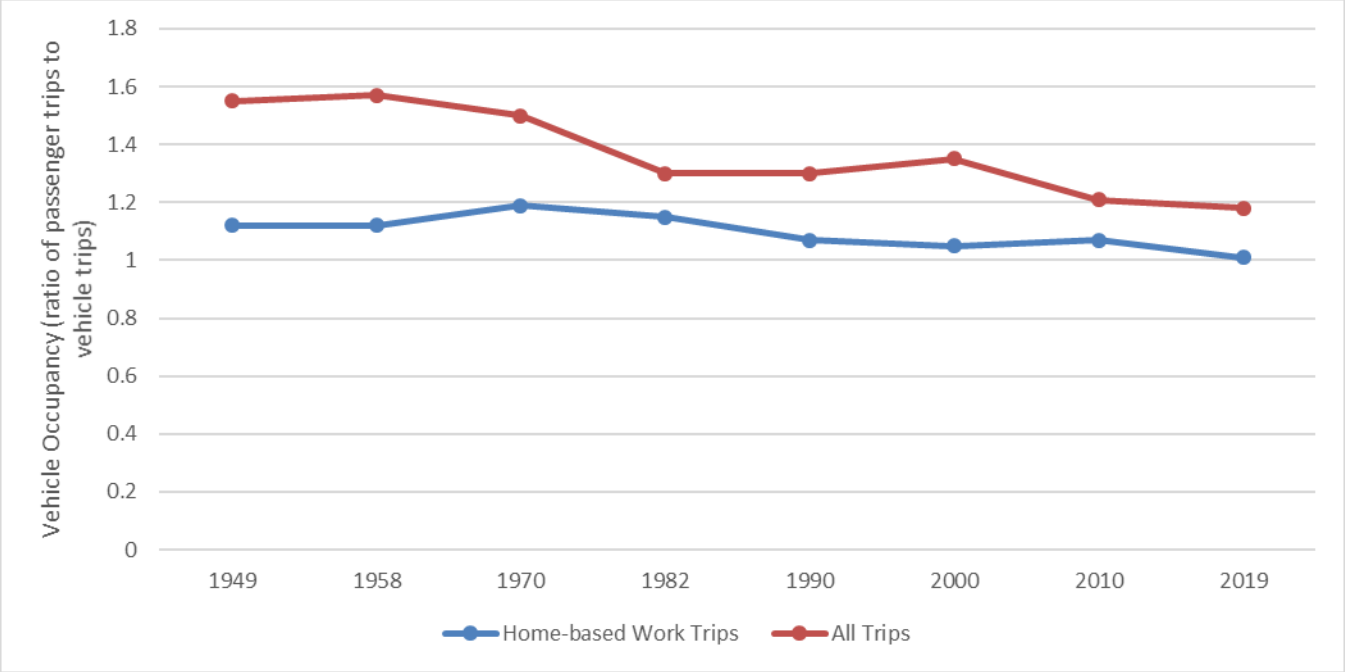
Vehicle Occupancy Trends

Overall vehicle-occupancy rates had been dropping in past decades, from a high of 1.57 persons in 1960 to 1.18 in 2019. Vehicle occupancy rates for work trips have continued to drop to levels of nearly on

e person per vehicle. **Figure 2-19** depicts trends in vehicle occupancy since 1949.

Vehicle occupancy rates for work trips have continued to drop to levels of nearly one person per vehicle.

Figure 2-19: Trends in Vehicle Occupancy, MPO Area



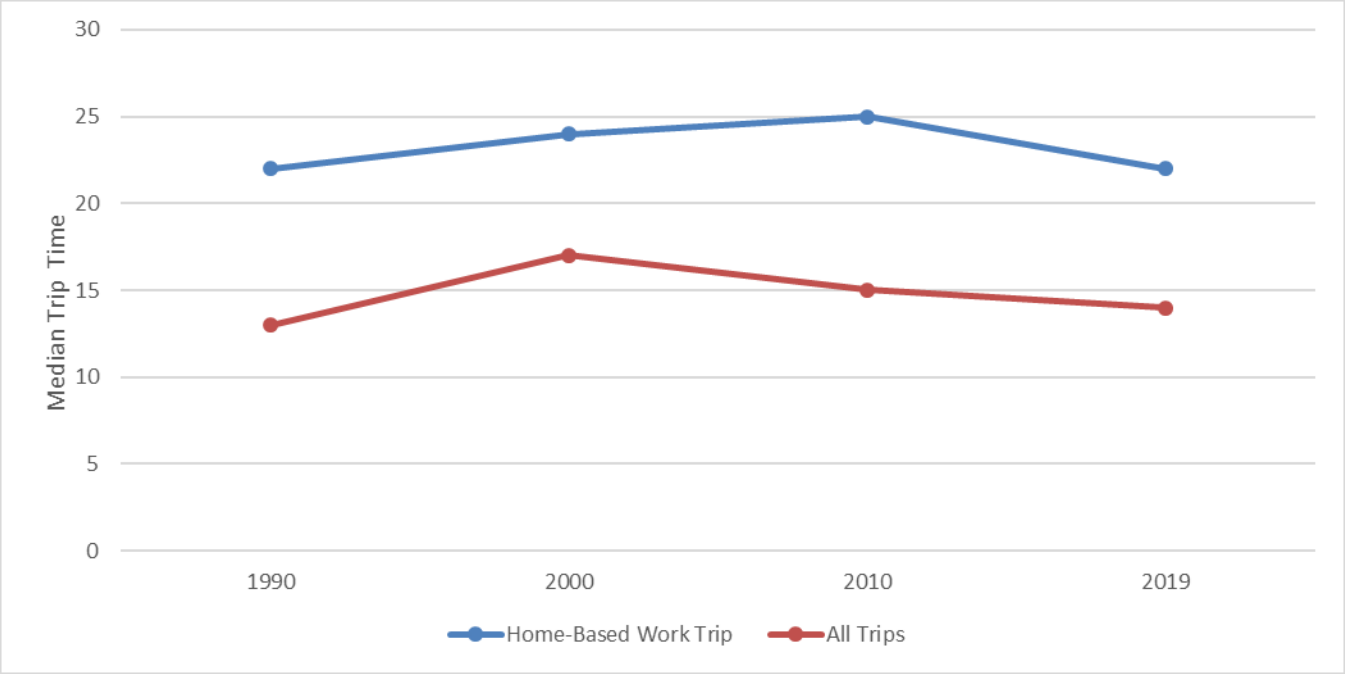
Travel Time per Trip

Median travel time for the home-based work trip decreased in 2019. The TBI found that the commute trip lengthened from a median of 22 minutes in 1990, to 24 minutes in 2000, and 25 minutes in 2010, then decreased slightly to 22 minutes in 2019. This decrease could be consistent with a recovering economy, wherein workers are able to find employment closer to home. Commuting to and from work accounts for 18 percent of regional travel, and 85% percent of regional commute trips are made by car. According to American Community Survey 1-year estimates for 2018, the average commute time in the Twin Cities MSA was 25.5 minutes.

Travel time for the home- based work trip and for all trip purposes continues to increase.

The median duration of trips for all purposes decreased slightly from 15 minutes in 2010 to 14 minutes in in 2018, down from a high of 17 minutes in 2000. **Figure 2-20** depicts the changes in average travel time.

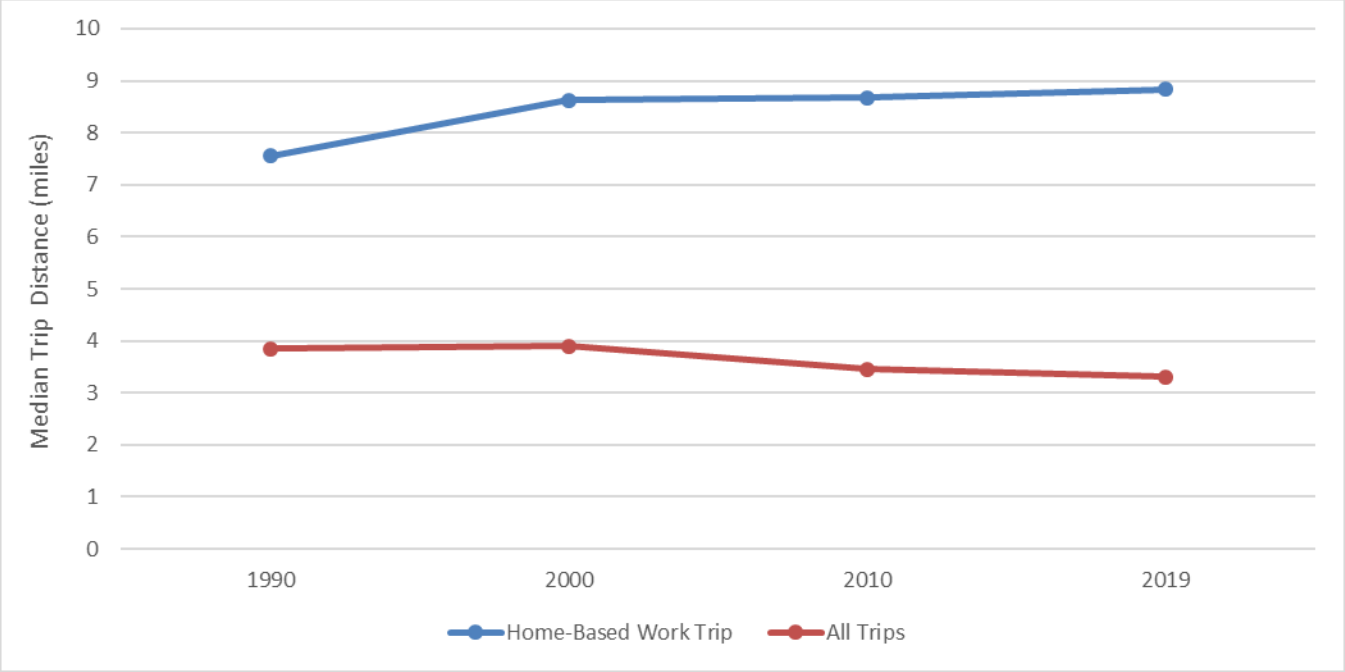
Figure 2-20: Median Travel Time



Trip distance

Median travel distance for home-based work trips stayed relatively steady from 2000 to 2019, increasing only from 8.6 miles in 2000 to 8.8 miles in 2019. Meanwhile trip distances for all trips declined slightly from a median of 3.9 miles in 2000 to 3.3 miles in 2019. **Figure 2-21** shows Median travel distance for home-based work trips and all trips for 1990-2019.

Figure 2-21: Median Travel Distance



Reliability

Reliability serves as a proxy for congestion, and measured with the Planning Time Index, represents the total travel time that should be planned for a trip to be late on only one work trip per month (1 out of 20 days). A higher Planning Time Index indicates a greater level of congestion. According to 2017 data from the Texas Transportation Institute, the Freeway Planning Time Index in 2017 for the Twin Cities region was 1.61 for automobiles, ranked 37th among urban areas evaluated. An index of 1.61 means that for one work trip per month, the total travel time will exceed 1.61 times what it takes to make the same trip in light traffic.

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 levels in 2012 and 2013 of $3.00 to $4.00 per gallon. Since 2013, average gas prices have declined to prices between $2.00 and $3.00 per gallon, similar to prices seen in 2007.

Since 2013, average gas prices have declined to prices between $2.00 and $3.00 per gallon, similar to prices seen in 2007.

Employment levels in the Twin Cities region went through a period of significant decline during the recession in the early 2010s; the employment in the region in 2010 was the lowest it had been in more than a decade. Regional employment has rebounded since 2010, contributing to growth in travel compared to the years during the recession.

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. While many trends returned to something closer to normal in 2019, the travel trends were still not following the same trends in growth that were experienced in the 1980s, 1990s, and 2000s.

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Chapter 3: The Highway System

Characteristics of the Regional Highway System

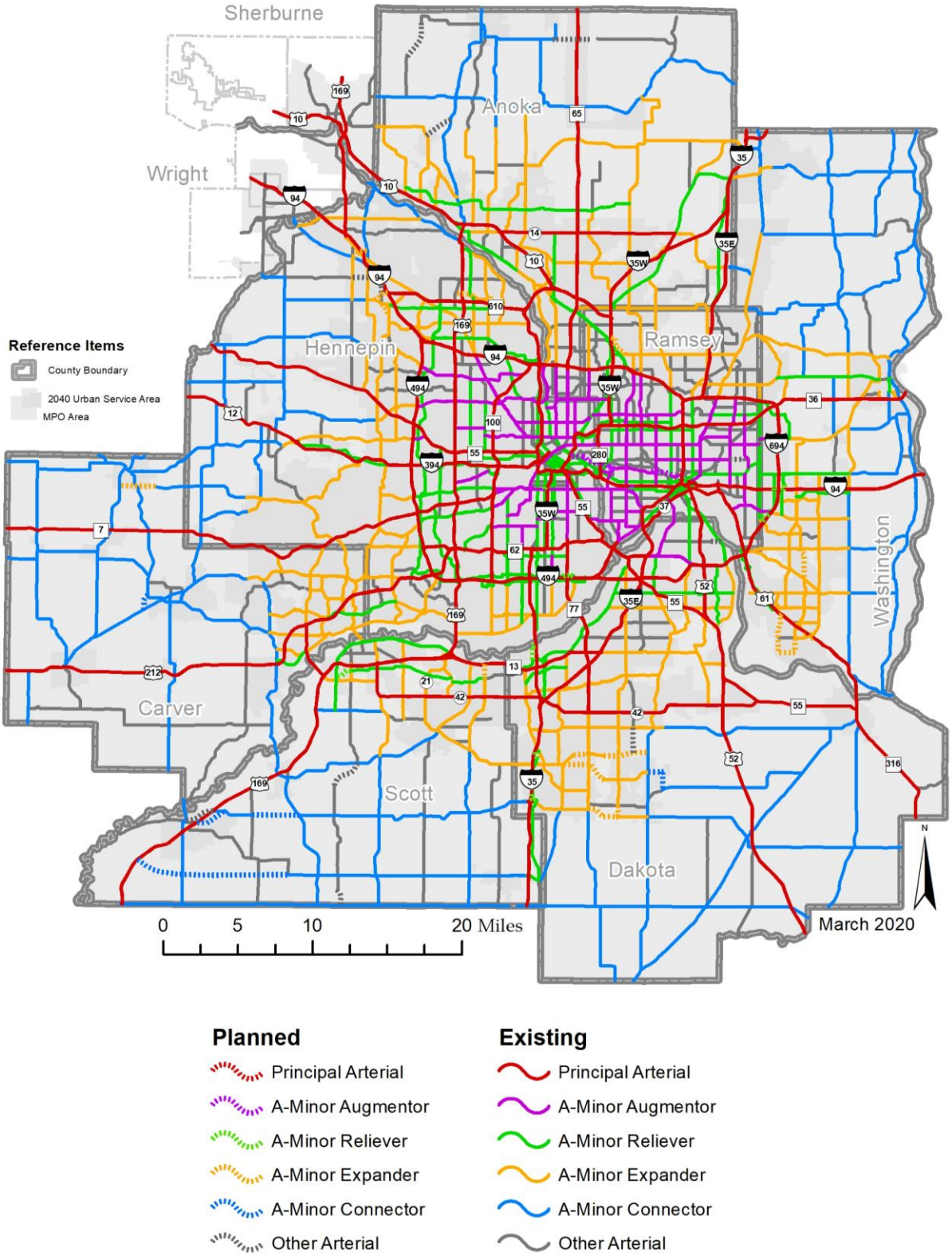
Infrastructure

Roadways

The Twin Cities region has nearly 17,000 miles of roadways as shown in **Figure 3-1**. The Functional Classification 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, collectors, and local streets.

The Twin Cities region has nearly 17,000 miles of roadways. The region uses a four-class system to designate the function of its roads — principal arterials, minor arterials, collectors, and local streets.

Figure 3-1: Roadway Functional Classification



Principal Arterials

Principal arterials are the high-capacity highways that make up the Metropolitan Highway System. The emphasis of principal arterials is on moving large volumes of traffic over long distances rather than providing direct access to land. They connect the region with other areas in the state, the nation, and the world. Principal arterials also connect regional concentrations and freight terminals within the metropolitan area. Principal arterials should support the longest trips in the region, including intercity bus, express bus, and highway bus rapid transit services. These are primarily the interstate and state trunk highway system, although some county highways are also included in the principal arterial system. There are approximately 700 miles of principal arterials within the region.

The emphasis of principal arterials is on moving large volumes of traffic over long distances rather than providing direct access to land.

Minor Arterials

These are highways and streets within the Twin Cities region that are not principal arterials but perform a regionally significant role in the transportation system. The minor arterial system supplements the principal arterial system and provides connections to the principal arterial system. Minor arterials also support access to major traffic generators, including regional job concentrations and freight terminals, and between rural centers within and just outside the region. Minor arterials should serve medium-to-short trips, including arterial bus rapid transit, limited-stop bus, and local bus service.

The minor arterial system supplements the principal arterial system and provides connections to the principal arterial system.

Within the seven-county area, not including Wright and Sherburne counties, the Metropolitan Council and its local partners have chosen to identify a subset of the most regionally significant minor arterials and designate them as the A-Minor Arterial System. The region has further classified its A-minor arterials into the following groups:

- **Augmentors:** Minor arterials that supplement the principal arterial system in more densely developed or redeveloping areas. These roads are located within Thrive MSP 2040-designated urban center and urban communities. The principal arterial network in these communities is in place, not changing significantly, and the community development density warrants the additional multimodal capacity and connectivity that Augmentors provide. There are approximately 200 miles of Augmentors in the seven-county region.
- **Connectors:** These roads provide safe, direct connections between rural centers and to principal arterials in rural areas without adding continuous general-purpose lane capacity. They are located within Thrive MSP 2040-defined rural communities. One end may be outside the seven-county area or may be in the urban service area. There are approximately 680 miles of Connectors in the seven-county region.
- **Expanders:** Minor arterials that supplement the principal arterial system in less densely developed or redeveloping areas. They are located within Thrive MSP 2040-designated urban, suburban, suburban edge, and emerging suburban edge communities. There are approximately 650 miles of Expanders in the seven-county region.
- **Relievers:** These roads provide supplementary capacity for congested, parallel principal arterials. They are in the Thrive MSP 2040-defined urban service area (urban center, urban, suburban, suburban edge, and emerging suburban edge communities). There are approximately 400 miles of Relievers in the seven-county region.

To differentiate from the A-minor arterial system, the Council refers to all minor arterials in Wright and Sherburne counties as “other minor arterials”. The Council also uses the phrase “other minor arterials” to refer to minor arterials within the seven-county area that are not on the A-minor arterial system.

To differentiate from the A-minor arterial system, the Council refers to all minor arterials in Wright and Sherburne counties as “other minor arterials”.

Collector Roads

Mobility and land access are equally important on the collector road system. The collector system provides connections between neighborhoods and from neighborhoods to regional job concentrations and local centers. It also provides supplementary connections between major traffic generators within regional job concentrations. Direct land access should primarily be to development concentrations. Collectors typically serve short trips of one to four miles, including local bus service. The Federal Highway Administration requires road authorities to distinguish between major and minor collectors. Major collectors serve higher density residential areas (often penetrating residential neighborhoods for significant distances), job and activity centers and freight terminals that are not on the arterial system, and they serve longer local trips, including local bus service. Minor collectors serve shorter local trips and lower density land uses (often penetrating residential neighborhoods only for a short distance). There are approximately 1,850 miles of major and minor collector streets within the region.

The collector system provides connections between neighborhoods and from neighborhoods to regional job concentrations and local centers.

Local Roads

Local roads connect blocks and land parcels, and the primary emphasis is on land access. In most cases, local roads connect to other local roads and collectors. Local roads serve short trips at low speeds, including trips made by foot, bicycle, and occasionally local bus service. There are approximately 12,000 miles of local streets within the region.

Local roads serve short trips at low speeds, including trips made by foot, bicycle, and occasionally local bus service.

Lane-Miles

The number of lane-miles within the Twin Cities Region increased by 0.99 percent (371 lane-miles) between 2014 and 2018. **Table 3-1 through 3-2** shows despite having a faster rate of growth in the parts of Wright and Sherburne counties within the Twin Cities metropolitan area, an increase of 3.8 percent, the overall increase in lane-miles is the Twin Cities Region is only slightly larger than that of the seven-county area. Within the seven-county area, lane-miles increased by approximately 335 lane-miles, or 0.92 percent.

Within the seven-county area, lane- miles increased by approximately 335 lane-miles, or 0.92 percent.

The regional number of lane-miles increased at a slower rate when compared to the increase in regional population between 2014 and 2018 (4.5 percent).

These slower rates of growth are in stark comparison to the 11.9 percent increase in lane-miles observed between 2000 and 2010.

Table 3-1: Seven-County Region Lane-Miles by Functional Classification

Functional Classification	2010	2014	2018
Principal Arterial	2,949	3,048	3,109
Minor Arterial	6,127	6,226	6,408
Collector	3,984	3,820	3,827
Local Systems	23,328	23,443	23,528
Total	36,388	36,537	36,872

Source: Minnesota Department of Transportation

Table 3-2: Wright and Sherburne County Lane-Miles by Functional Classification

Functional Classification	2014	2018
Principal Arterial	78	89
Minor Arterial	87	88
Collector	127	159
Local Systems	653	646
Total	945	981

Source: Minnesota Department of Transportation

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. MnDOT classifies RQI using the following categories:

- Very Good: RQI > 4.0
- Good: RQI > 3.0
- Fair: RQI > 2.0
- Poor: RQI > 1.0
- Very Poor: RQI $\leqslant$ 1.0

MnDOT has established performance targets to maintain at least 70 percent of principal arterials and 65 percent of non- principal arterials in good or very good condition, and allow less than 2 percent of principal arterials and 3 percent of non-principal arterials to be in poor or very poor condition. Statewide, MnDOT's trunk highway system consists of approximately 12,000 centerline miles of pavement, comprised of roughly 13 percent Interstate, 40 percent Other National Highway System (NHS), and 47 percent Non-NHS.

Pavement condition for principal arterials and or non-principal arterials have generally not met MnDOT performance targets since 2001 and the late 1990s, respectively, with the exception of principal arterials in poor or very poor condition, which have met the MnDOT targets since 2017.

As shown in **Figures 3-2** through **3-5**, the pavement condition for both principal arterials and non-principal arterials did not meet MnDOT's performance targets in 2018. In the metropolitan region, the condition of the principal arterials met both performance targets until 2001. Since 2001, the percentage of roadways with good or better pavement condition exceeded 70 percent in only two years, 2010 and 2013. Additionally, the percentage of roadways with a poor or very poor rating dropped below 2 percent in 2017, the first time since 2001, and remained below 2 percent in 2018.

The non-principal arterials have not met pavement quality performance targets since the late 1990s. The non-principal arterials exhibit a greater and more consistent gap between the observed pavement conditions and the performance targets.

Figure 3-2: Principal Arterials - Ride Quality Index in Good/Very Good Category

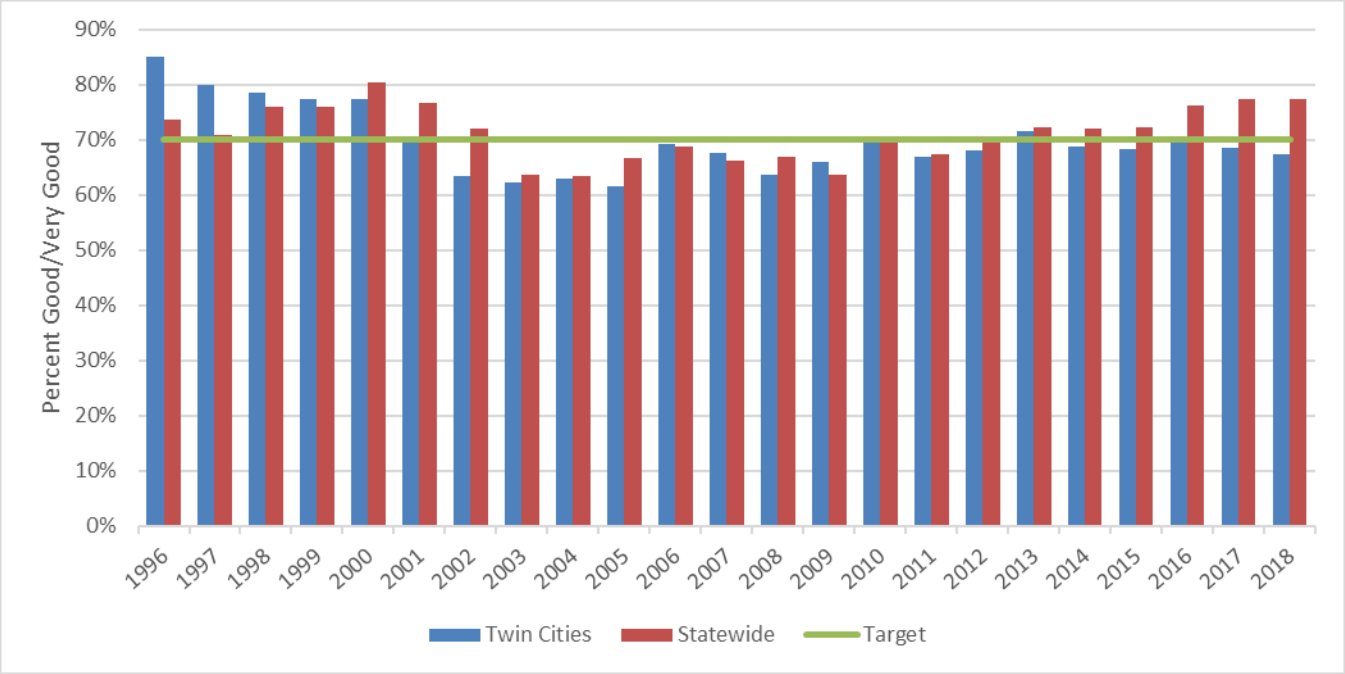


Figure 3-3: Principal Arterials - Ride Quality Index in Poor/Very Poor Category

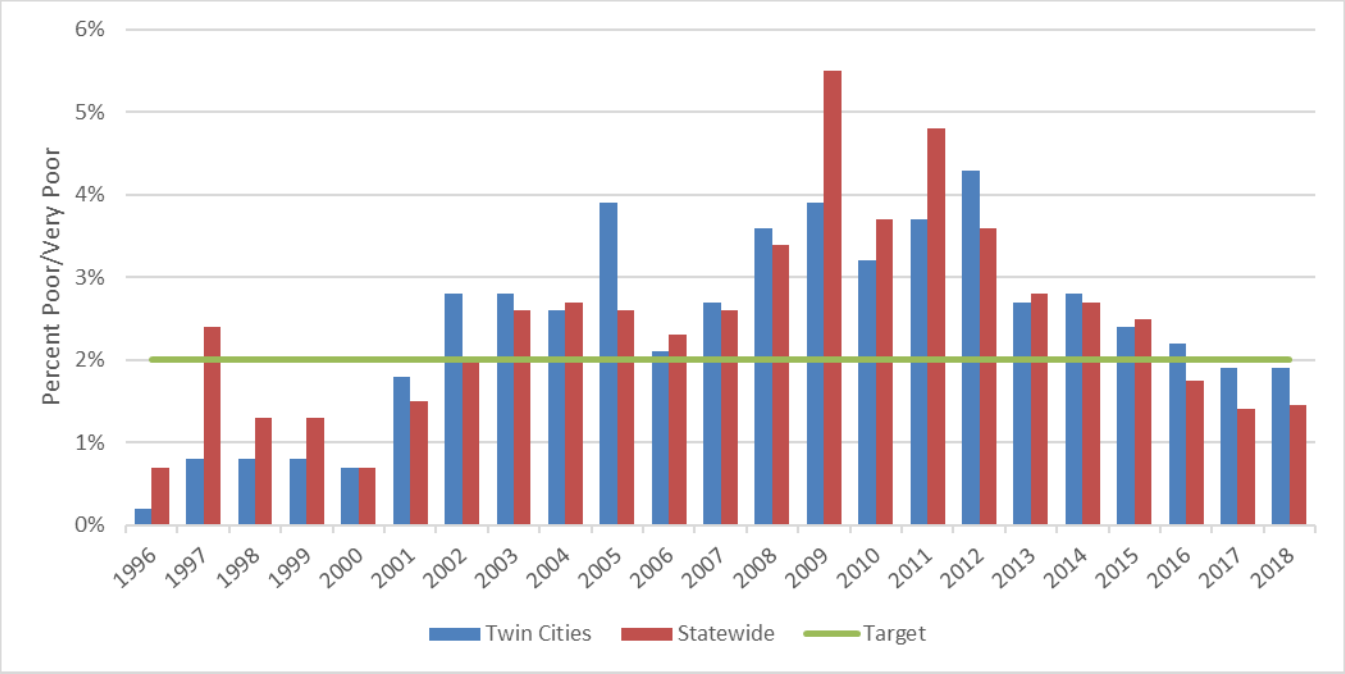


Figure 3-4: Non-Principal Arterials - Ride Quality Index in Good/Very Good Category

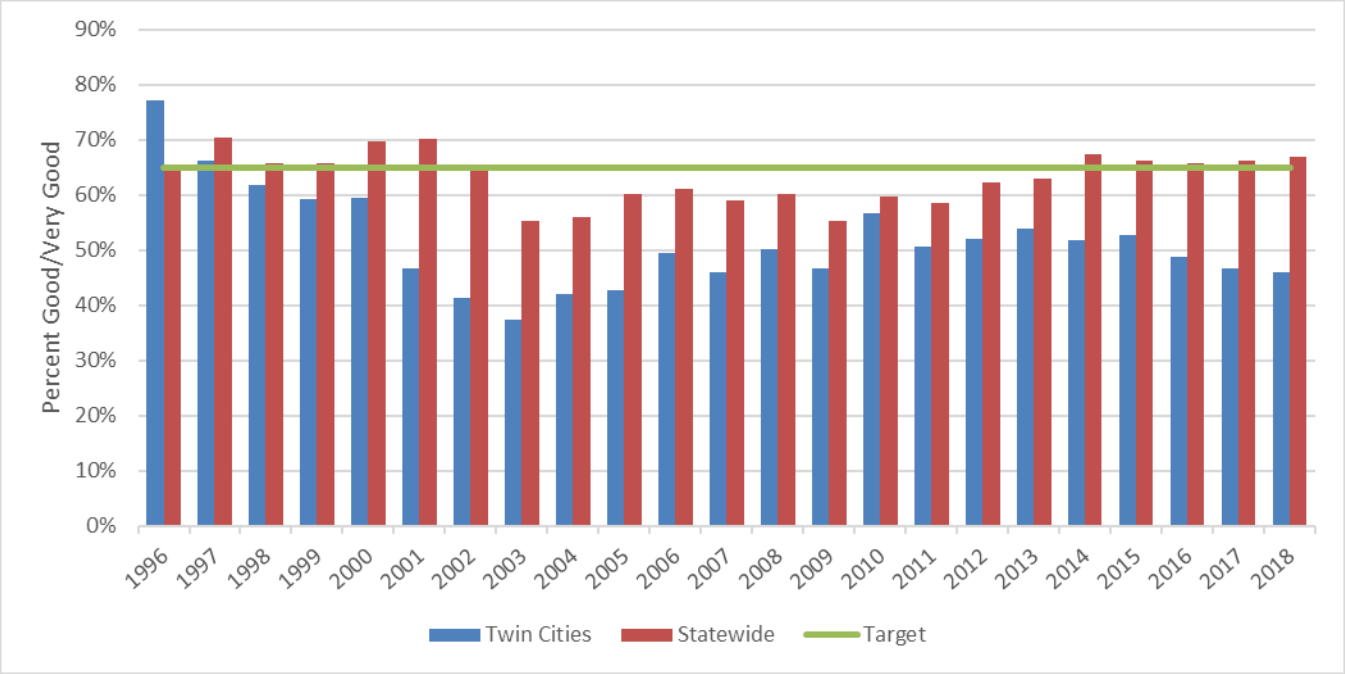
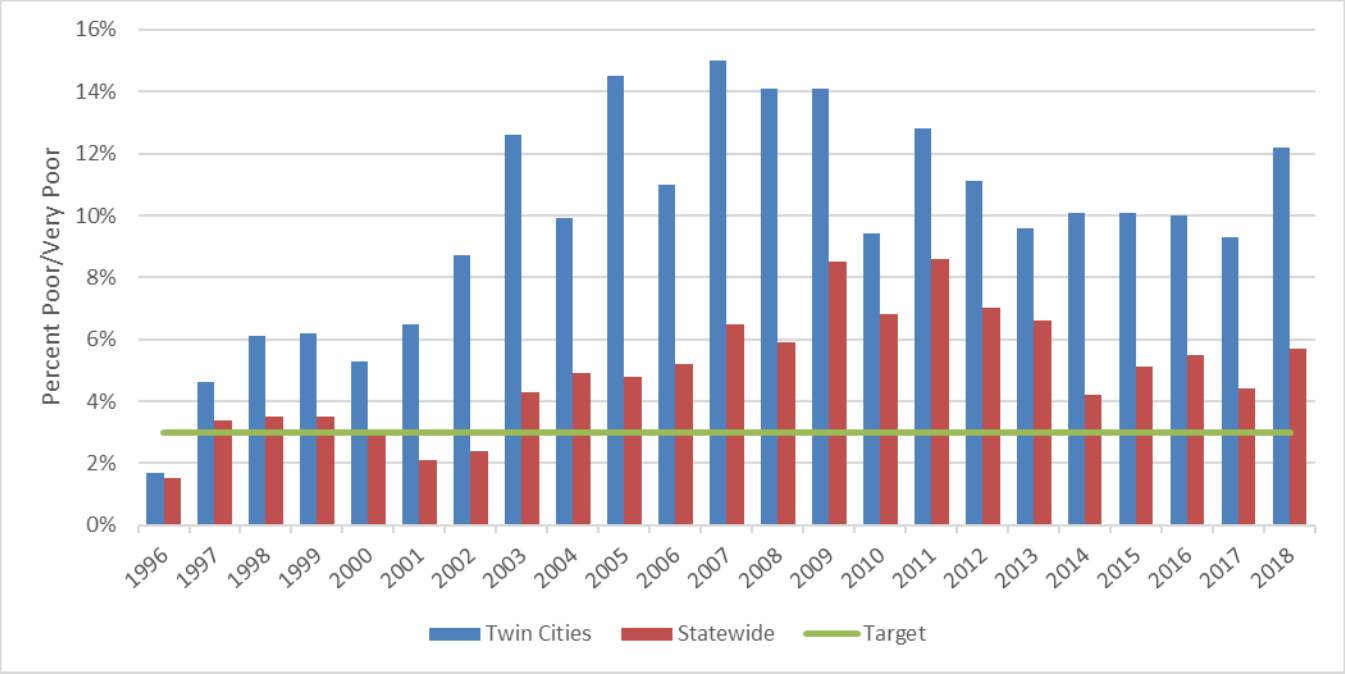


Figure 3-5: Non-Principal Arterials - Ride Quality Index in Poor/Very Poor Category



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 status of the 172 bridges listed in the 2018 annual report was as follows:

In 2008, 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.

- 123 bridges substantially complete (i.e., open to traffic) 4 bridges will be complete in 2018
- 10 bridges scheduled to be under contract for repair or replacement in 2018
- 32 bridges only need routine maintenance during the Chapter 152 program years
- 2 bridges are privately owned
- 1 bridge is closed to traffic and therefore will not receive any work under Chapter 152

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. MnDOT establishes performance targets for bridge condition in its statewide multimodal transportation plan, Minnesota GO.

Principal arterial bridges in good condition decreased since 2015, failing to meet the targets in 2017 and 2018. However, principal arterial bridges in poor condition have met MnDOT performance targets since 2015. Metropolitan Council and MnDOT should continue to monitor these trends.

As shown in **Figure 3-6**, the principal arterial bridge ratings for the Twin Cities region fell below the performance target for the good category in the early 2000s. Performance met targets for good condition from 2005 to 2016 except for 2013. In 2017 the Twin Cities region's bridges fell below the performance target and remained below the target in 2018. As shown in **Figure 3-7**, principal arterial bridges did not meet the MnDOT performance target for percent of bridges in poor condition until 2015, when it met the performance target for the first time. Since 2015, principal arterial bridges have met the poor condition performance target each year.

Non-principal arterial bridges in good condition met the MnDOT performance targets each year from 2001 until 2016. In 2017 the percentage of non-principal arterial bridges in good condition fell below the MnDOT performance targets and remained below the target in 2018, as shown in **Figure 3-8**. Non-principal arterial bridges in poor condition have met the MnDOT performance target each year from 2004 until 2015. Since 2016 non-principal arterial bridges have not met the poor condition performance target, as shown in **Figure 3-9**.

Figure 3-6: Percent Principal Arterial Bridge Area in Good Category

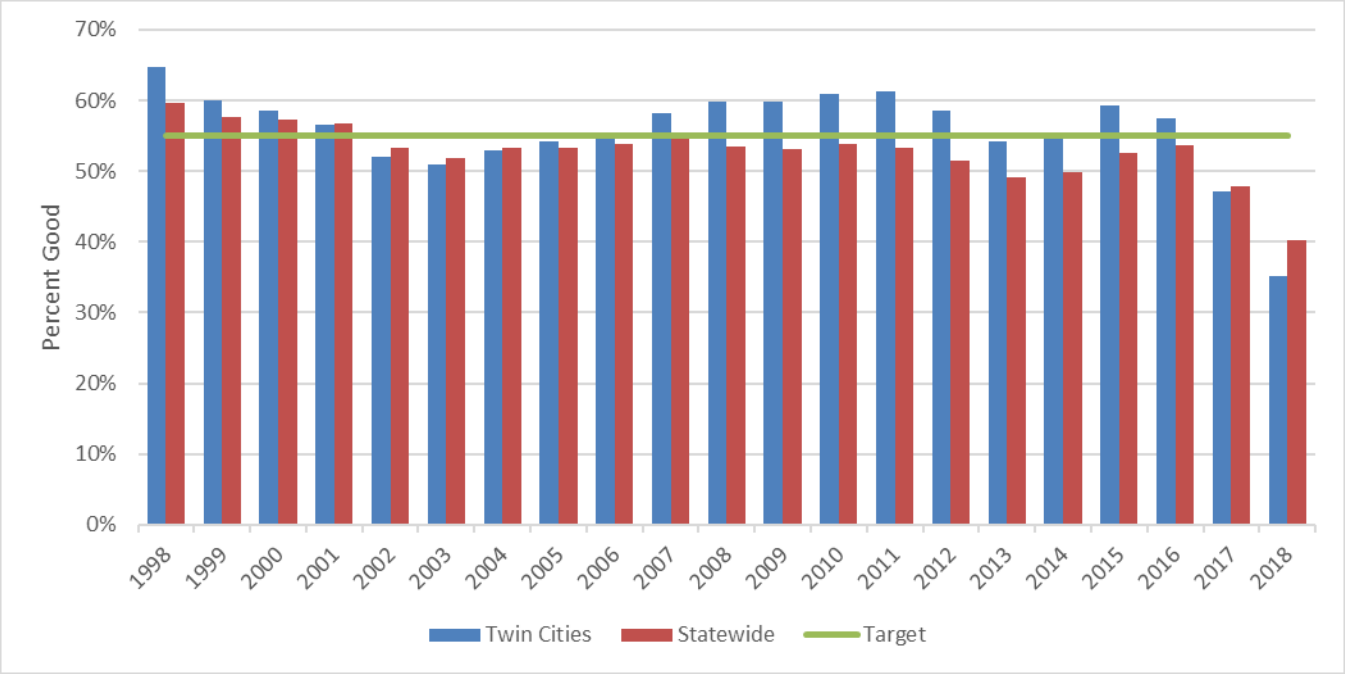


Figure 3-7: Percent Principal Arterial Bridge Area in Poor Category

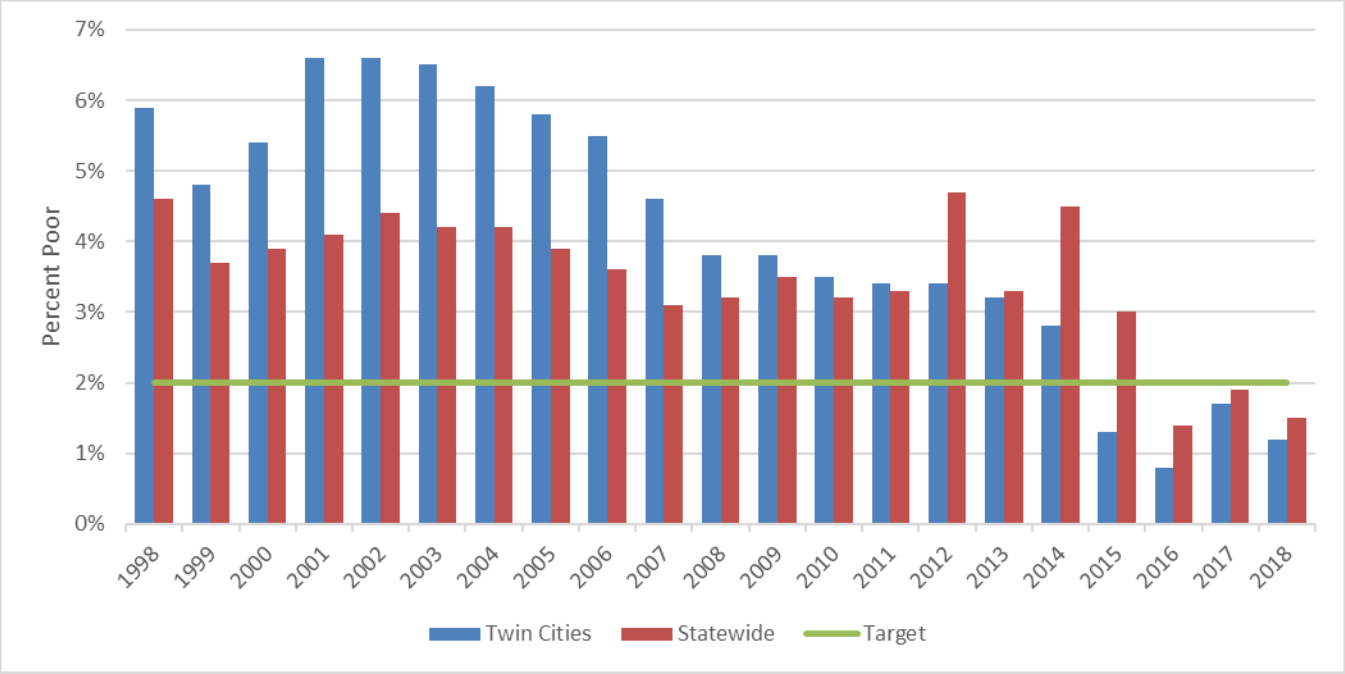


Figure 3-8: Percent Non-Principal Arterial Bridge Area in Good Category

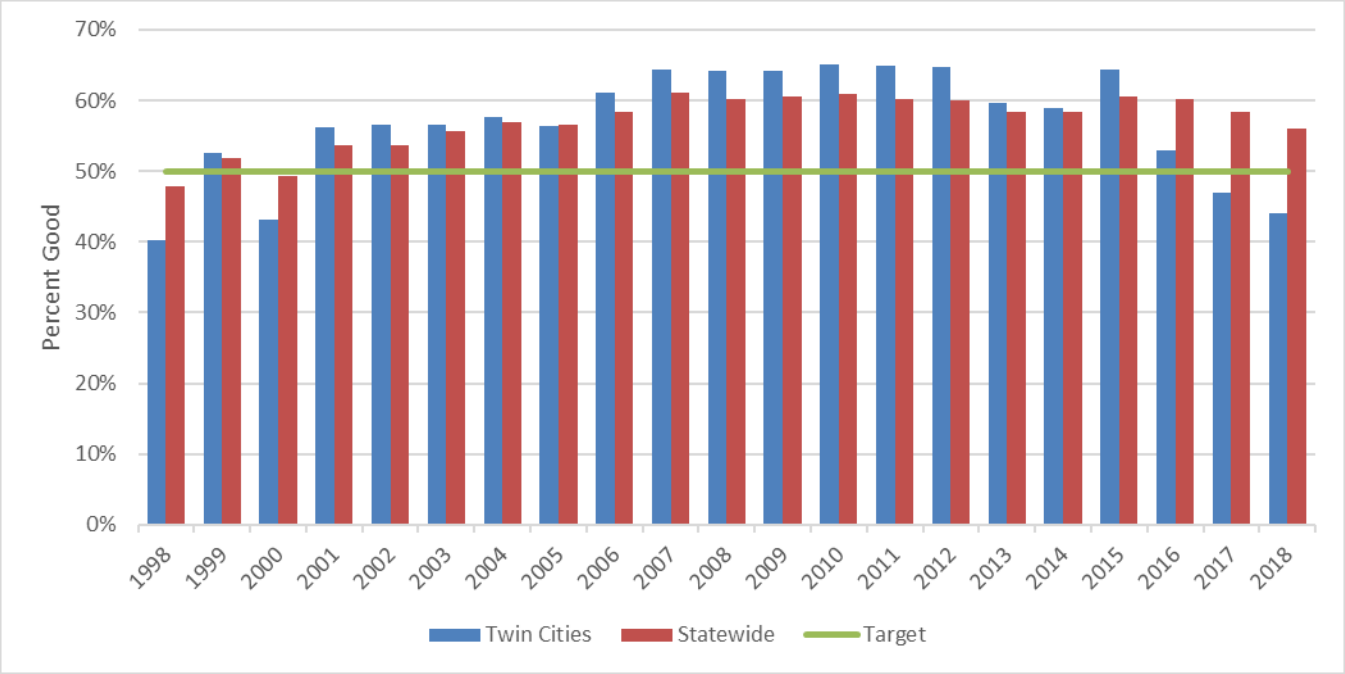
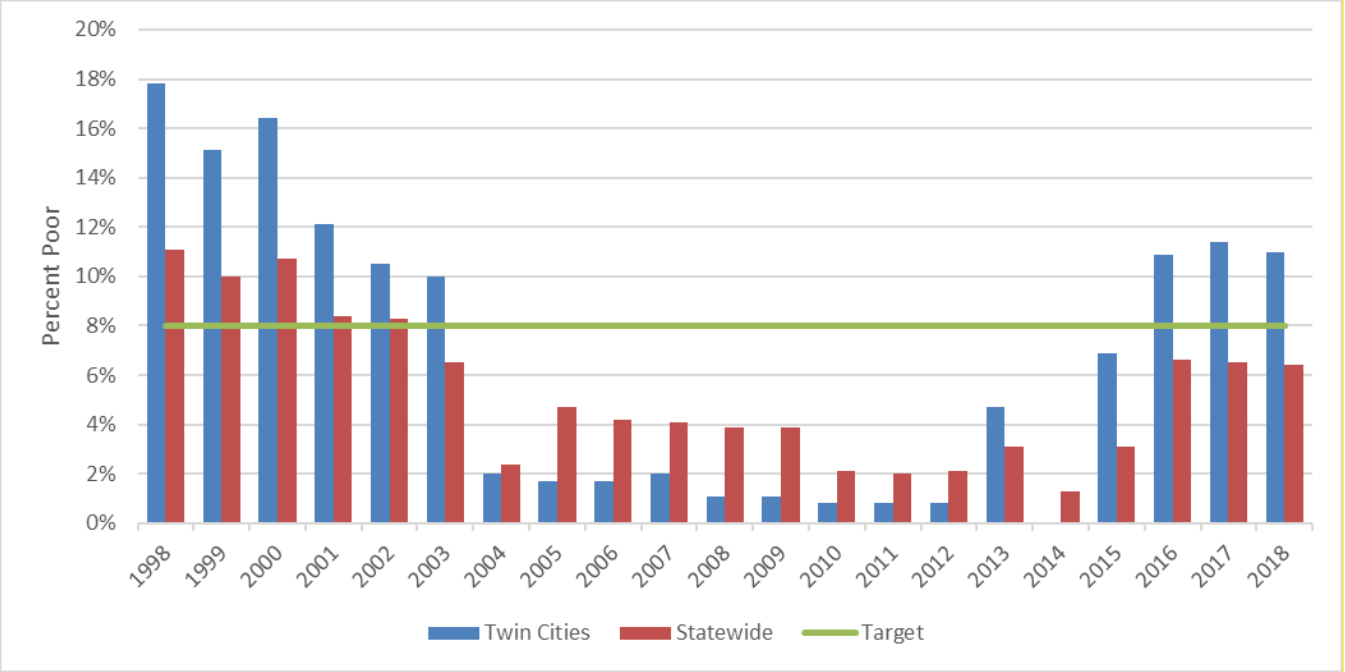


Figure 3-9: Percent Non-Principal Arterial Bridge Area in Poor Category



Operations

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.

Table 3-3 through 3-4 shows that within the seven-county area, VMT increased by approximately 5.3 percent between 2014 and 2018. Within the parts of Wright and Sherburne counties that is with the planning area, VMT increased by 7.1 percent. In the Twin Cities region, VMT increased by 5.6%.

Data from the Texas Transportation Institute shows that freeway and arterial roadway use has increased generally consistently over the past 30 years.

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 5.6 percent of lane-miles but carry 42 percent of the vehicle-miles traveled.

Recent trends within the seven-county area (excluding the addition of Sherburne and Wright Counties) have shown an increase in vehicle miles traveled on principal arterials, minor arterials, collectors, and local systems.

As shown in **Figure 3-10**, data from the Texas Transportation Institute, which tracks historical VMT across the nation's metropolitan regions, shows that freeway and arterial roadway use has increased generally consistently over the past 30 years. Total VMT increased approximately 49 percent between 1990-2000. Arterial roadway daily VMT decreased in 2016, but subsequently increased in 2017. In the 17 years between 2000 and 2017, daily VMT on freeways increased nearly 22 percent, while daily VMT increased by over 18 percent on arterial streets. Values differ slightly from the previously reported data due to the different regional boundaries assumed by Texas Transportation Institute.

Table 3-3: Seven-County Region

Functional Classification	2014	2018
Principal Arterial – Freeway	30,656,640	33,315,247
Principal Arterial – Other	8,162,947	7,661,718
Minor Arterial	22,390,004	22,390,129
Collector	5,252,757	5,513,695
Local Systems	9,017,601	9,745,649
Total	74,454,950	78,626,437
2014-2018 Percent Change		+5.3%

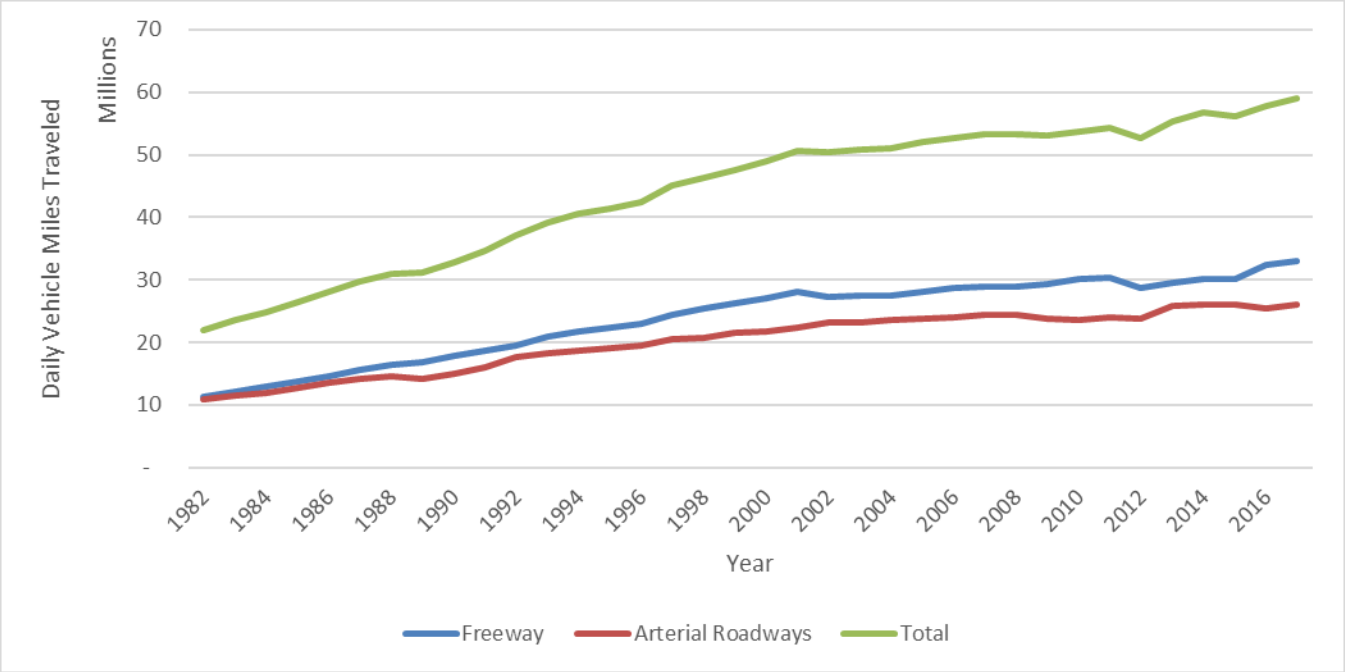
Source: MnDOT

Table 3-4: Wright and Sherburne County Vehicle Miles Traveled by Functional Classification

Functional Classification	2014	2018
Principal Arterial – Freeway	307,988	274,842
Principal Arterial – Other	617,759	659,373
Minor Arterial	323,859	343,800
Collector	183,113	359,014
Local Systems	234,296	248,800
Total	1,667,015	1,785,828
2014-2018 Percent Change		+7.1%

Source: MnDOT

Figure 3-10: Daily Vehicle Miles Traveled – Twin Cities Region

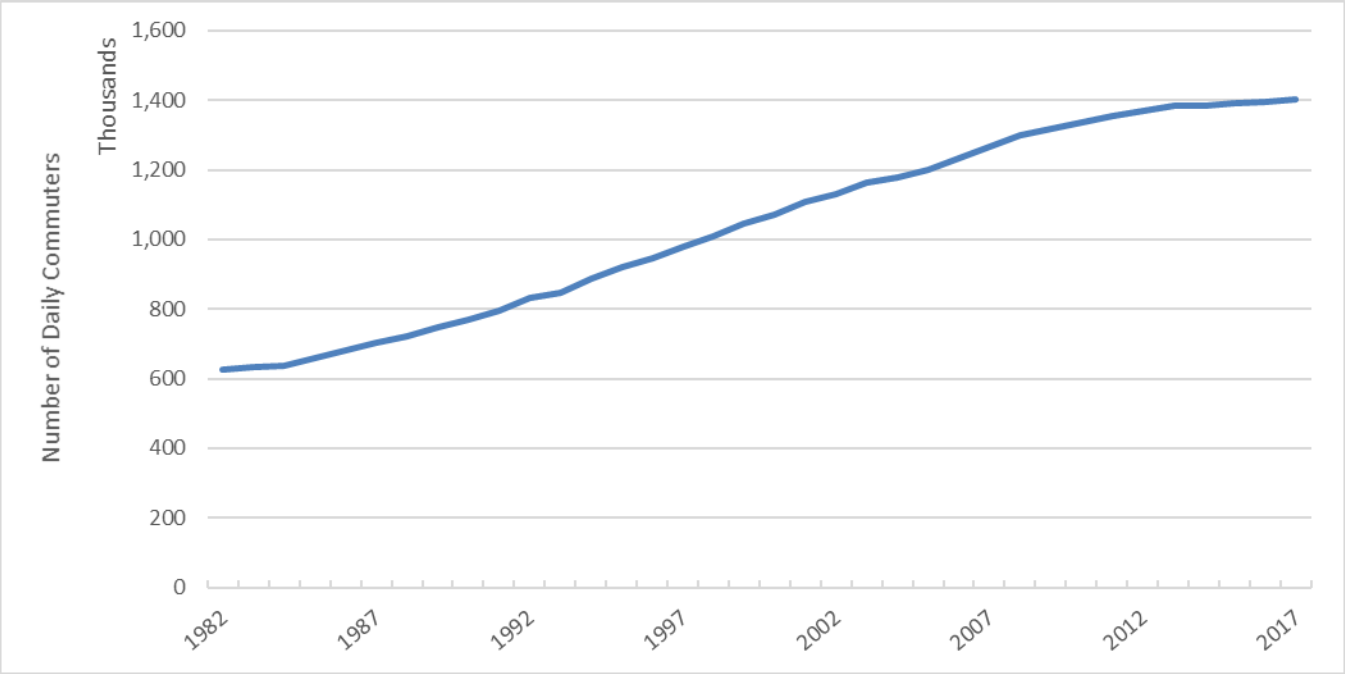


Source: Texas Transportation Institute

Peak Period Travelers

Data from the Texas Transportation Institute on peak period travelers shows a generally increasing trend in peak period travel in the Twin Cities region. **Figure 3-11** shows that between 1990 and 2017, the number of travelers on the roadways in the Twin Cities region during the peak period increased by about 83% percent.

Figure 3-11: Peak Period Travelers



Source: Texas Transportation Institute

MnPASS System

Priced managed lanes provide a less congested and more reliable travel option during rush hours for people who ride transit or in carpools, and other motorists who are willing to pay. In the Twin Cities, we call this system MnPASS. The region currently operates MnPASS lanes on Interstate 394, Interstate 35W south of downtown Minneapolis, and Interstate 35E north of downtown Saint Paul. The MnPASS lanes on I-394 extend 11 miles between I-494 in Wayzata and downtown Minneapolis. The I-394 lanes were converted from high-occupancy vehicle (HOV) lanes in 2005.The MnPASS lanes on I-35W extend 20 miles between the I-35 split in Burnsville and downtown Minneapolis. The I-35W lanes also started as HOV lanes, but were extended and converted to MnPASS lanes through a project funded by the federal Urban Partnership Agreement (UPA) program. The most recently added MnPASS lane is on I-35E. In the northbound direction, the MnPASS lane extends 9 miles between Cayuga Street in downtown St. Paul and County Road J in White Bear Lake, with a gap around the I-694 interchange area. In the southbound direction, the MnPASS lane begins at County Road 96 and provides a continuous lane through Cayuga Street. The I-35E MnPASS lane was the first in the east metro. The portion between Cayuga Street and I-694 opened in 2015, and the remaining portion between I-694 and County Road J opened in 2016.

The region currently operates MnPASS lanes on Interstate 394, Interstate 35W south of downtown Minneapolis, and Interstate 35E north of downtown Saint Paul.

Table 3-5 describes MnPASS system reliability in the Twin Cities, showing the daily share of time that each MnPASS lane maintained speeds of 45 miles per hour or greater in 2018.

Table 3-5: MnPass Lane Percentage Time Uncongested (2018)

Road segment	AM	PM
I-394 EB from I-494 to TH 100	97%	-
I-394 EB from TH 100 to Downtown MPLS	92%	-
I-394 WB from Downtown MPLS to TH 100	-	98%
I-394 WB from TH 100 to I-494	-	99%
I-35W NB from Burnsville to I-494	95%	-
I-35W NB from I-494 to Downtown MPLS	96%	96%
I-35W SB from Downtown MPLS to I-494	99%	98%
I-35W SB from I-494 to Burnsville	-	96%
I-35E SB from Little Canada to Cayuga St	92%	-
I-35E NB from Cayuga St to Little Canada	**-**	96%

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:

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.

- **Traffic Volumes and Throughput:** After the meters were turned off, there was an average of a 9 percent 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 percent 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 percent. 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.

A new ramp metering algorithm was deployed system-wide following testing on Highway 100 in 2012. The mainline benefits resulting from the study on Highway 100 are summarized below; as compared to the previous ramp metering algorithm:

A new ramp metering algorithm was deployed system- wide following testing on Highway 100 in 2012.

- The new metering strategy resulted in 5.3 percent greater VMT and 9.5 percent fewer vehicle hours traveled (VHT)
- Delayed vehicle hours decreased by 48 percent
- The 95th percentile Travel Time Buffer Index decreased by 21 percent, indicating travel time reliability has increased substantially after the new metering algorithm was implemented

In addition to the Highway 100 study, MnDOT analyzed the benefits of new ramp meters on Highway 212 west of I-494 and found that delay was reduced by approximately 12 percent while VMT increased by roughly 3 percent.

Congestion

MnDOT has embedded detectors that estimate the speed of traffic to help in assessing the performance of the freeway system. As defined by MnDOT, free-flow conditions are speeds above 45 miles per hour, and speeds below 45 miles per hour are deemed congested. MnDOT calculates the share of freeway system mileage that operate at congested speeds for any length of time. Directional congestion is further defined by the number of congested hours per peak period:

- Low: < 1 Hour
- Moderate: 1 to 2 Hours
- Severe: > 3 Hours

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 and extent of the monitored system has been expanding over time. However, MnDOT data (**Table 3-6** and **Figure 3-12**) shows the same trend as the Texas Transportation Institute VMT data (see **Figure 3-10**), with congestion increasing considerably during the 1990s and leveling off somewhat during the early 2000s. The share of freeway miles that are congested hovered between about 17 percent and 23 percent between 2002 and 2017, peaking at 24.2 percent in 2018.

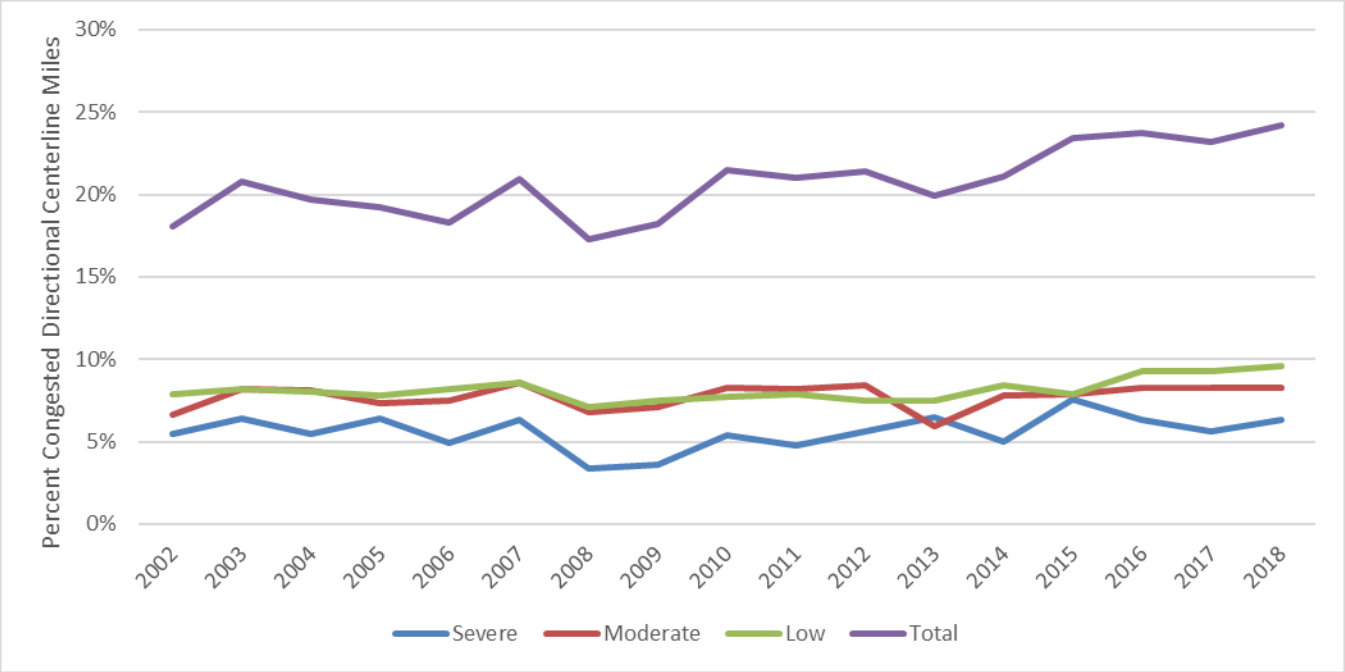
MnDOT data shows the same trend as the Texas Transportation Institute data, with congestion increasing considerably during the 1990s and leveling off somewhat during the early 2000s.

Table 3-6: Miles of Directional Congestion (Am Plus Pm)

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Severe	83	72	83	64	82	51	55	82	73	85	99	76	115	94	88	98
Moderate	105	105	94	97	112	104	107	127	125	128	90	118	120	125	130	131
Low	106	104	101	107	111	108	114	117	121	113	114	127	120	141	145	150
Total [2]	293	280	277	267	305	263	276	326	319	325	302	321	354	360	363	379

Figures 3-13 through **3-18** show how freeway congestion has changed on the system from 1995 to 2018.

Figure 3-12: Percent of Miles of Directional Congestion (AM plus PM)



[2] Total may not equal Severe + Moderate + Low due to rounding.

Figure 3-13: 1995 AM Congestion

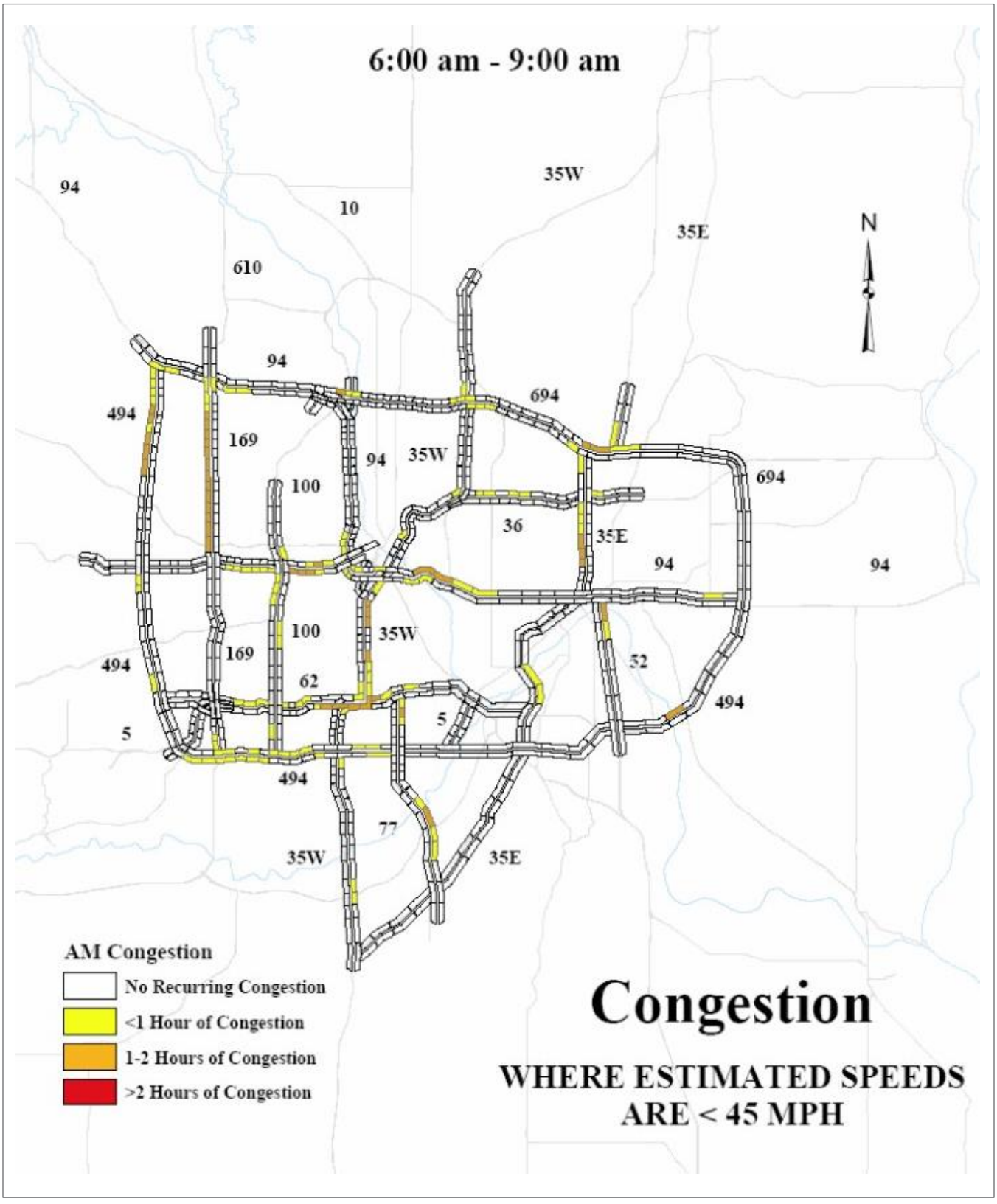


Figure 3-14: 2005 AM Congestion

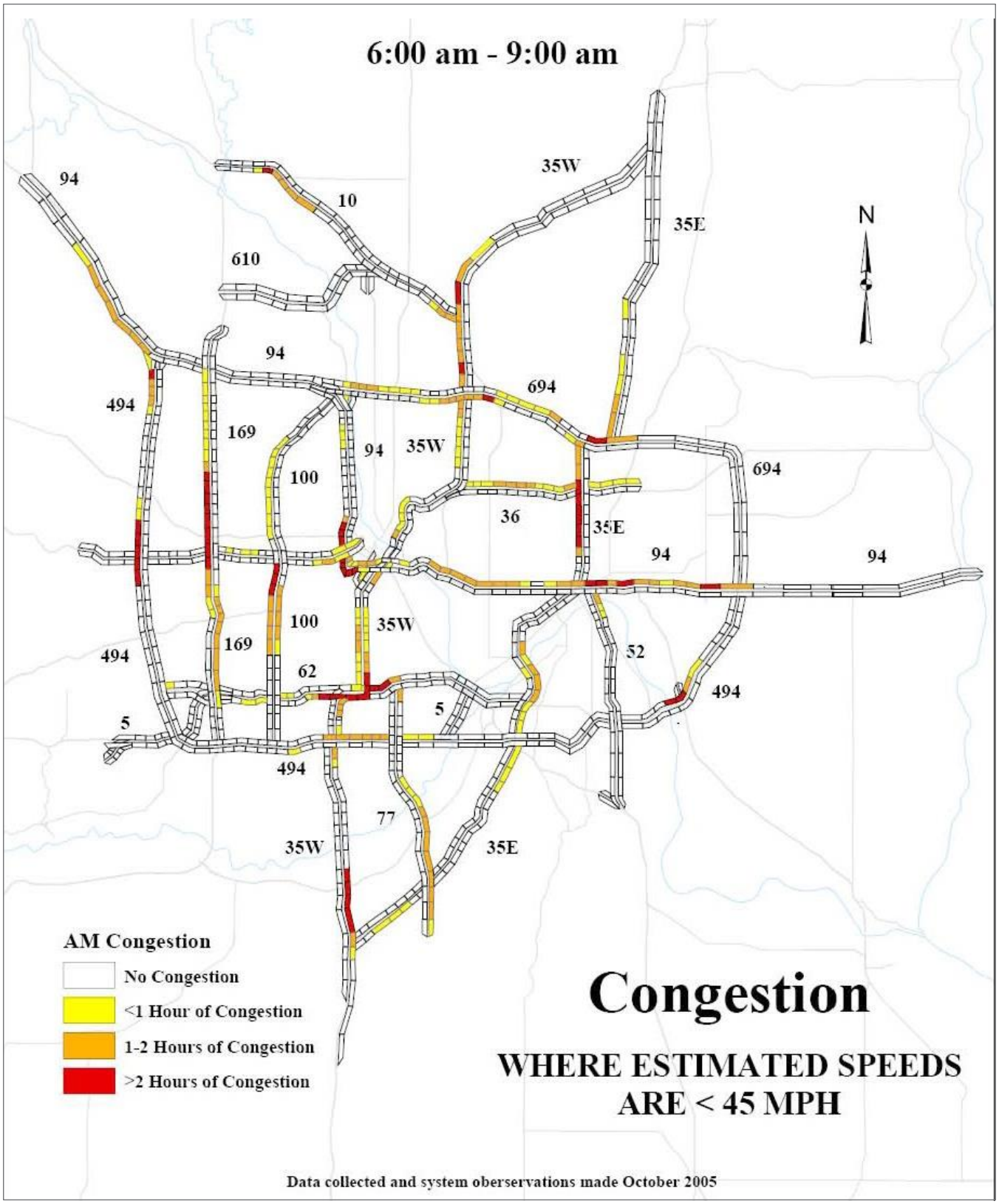


Figure 3-15: 2018 AM Congestion

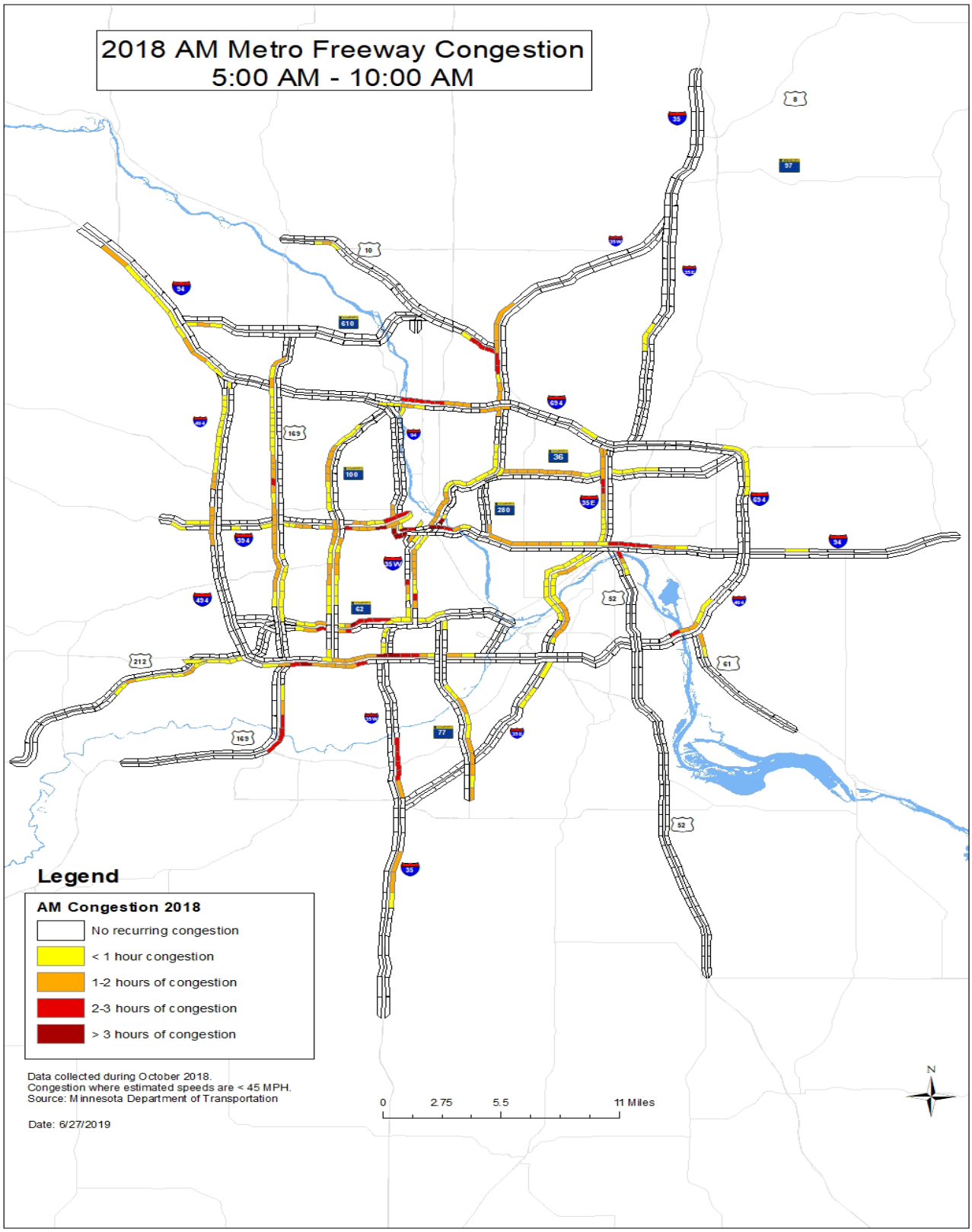


Figure 3-16: 1995 PM Congestion

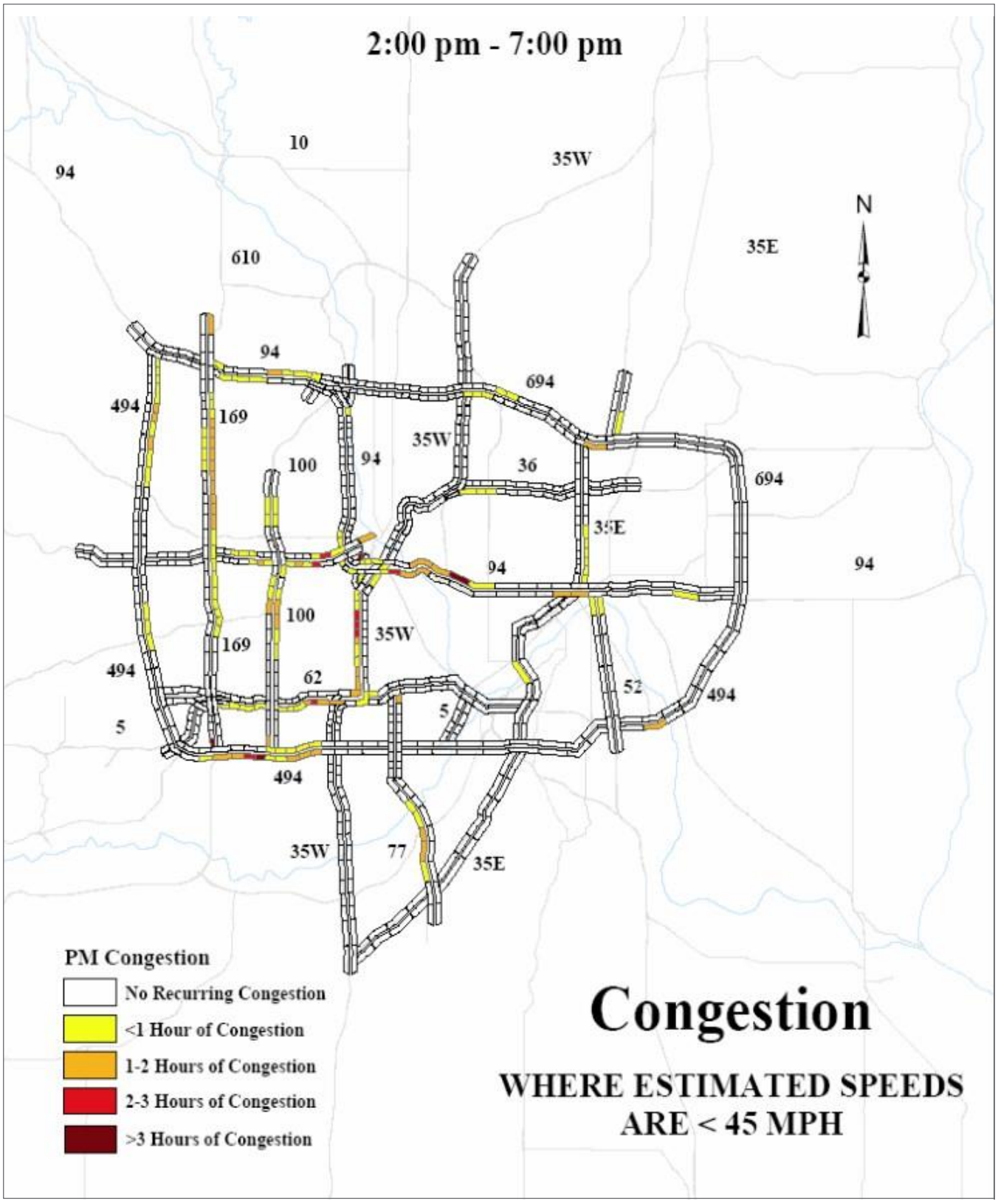


Figure 3-17: 2005 PM Congestion

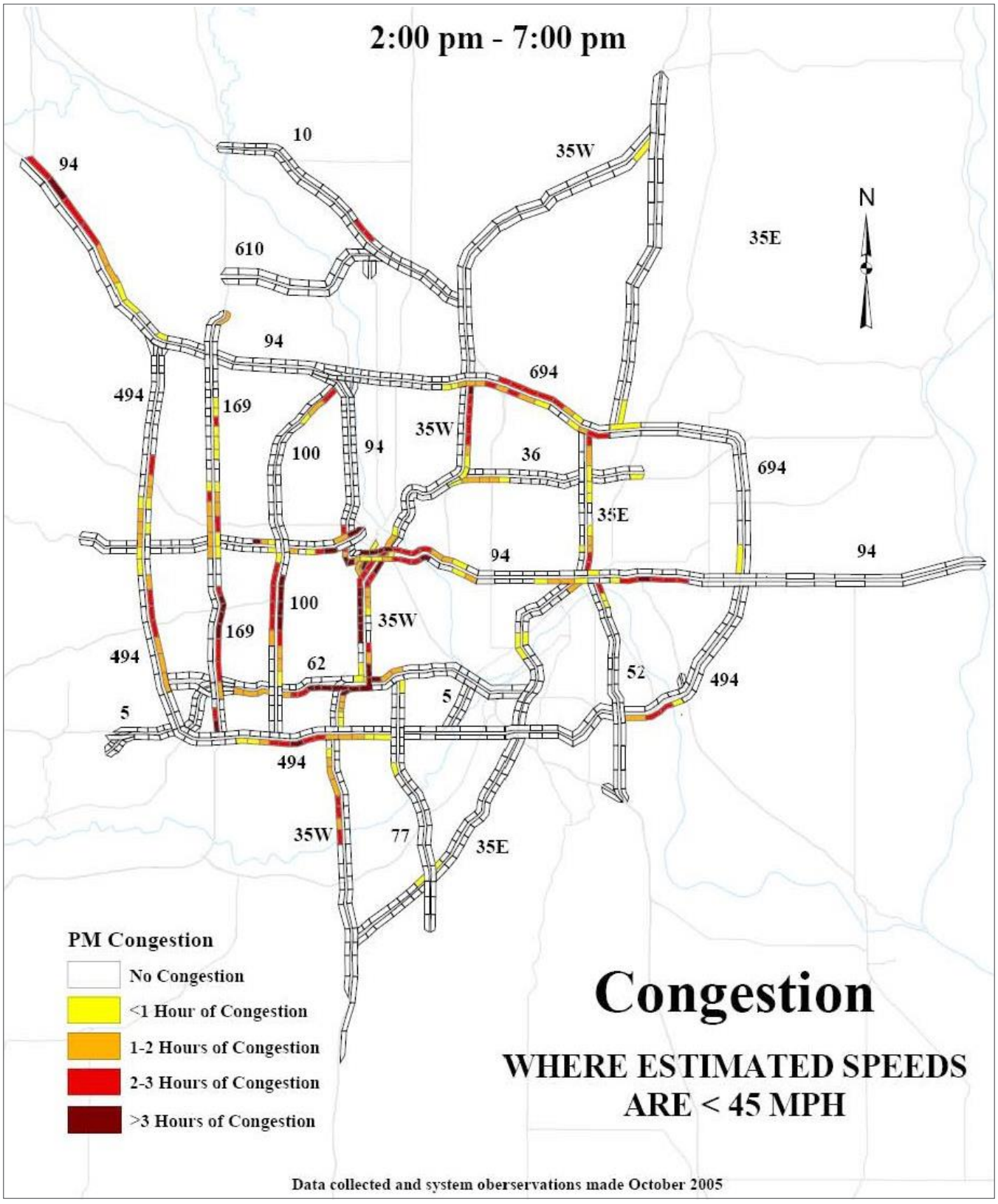
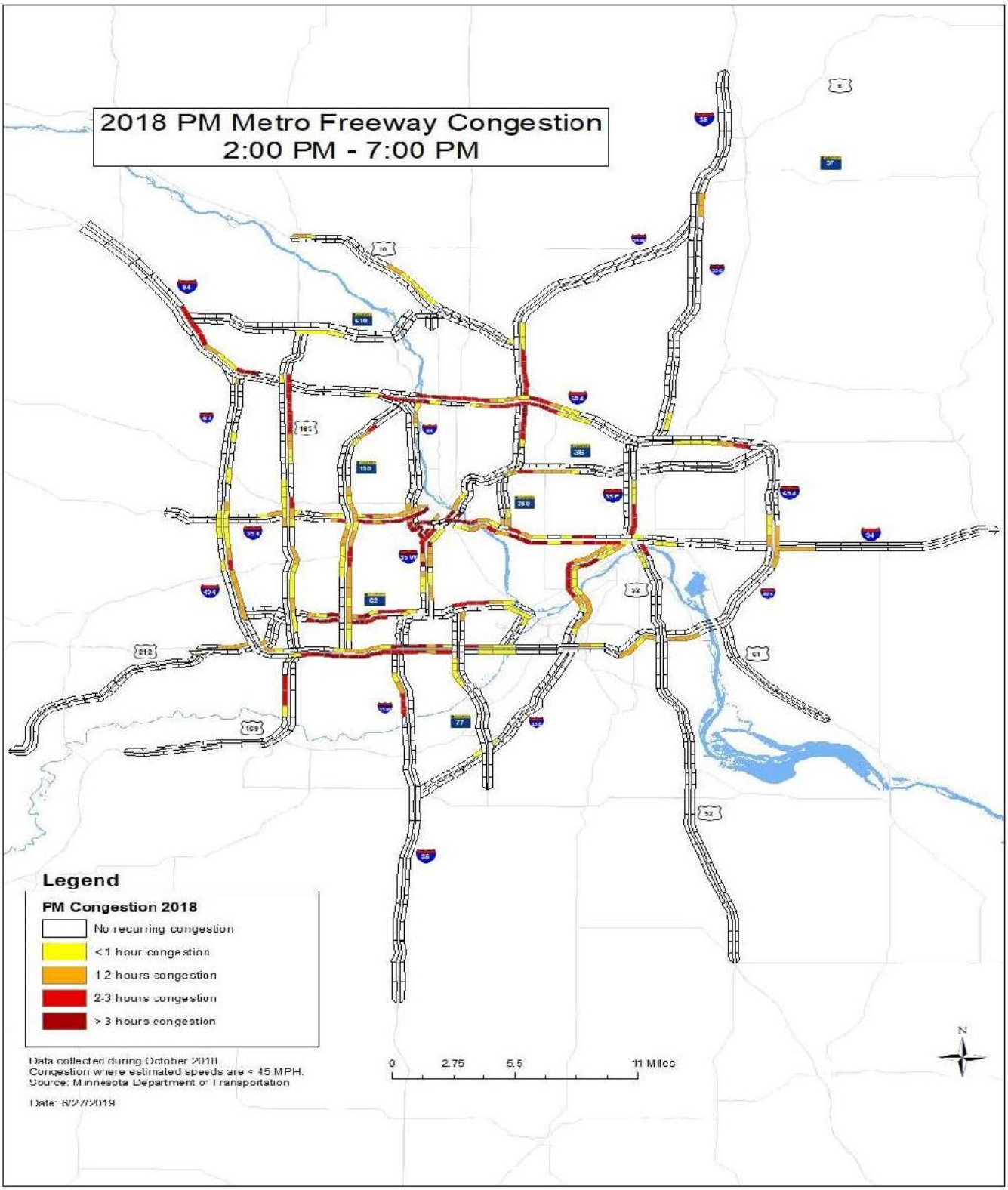


Figure 3-18: 2018 PM Congestion



Delay

To the typical commuter, the amount of time spent in congestion is generally more important than the number of congested freeway miles. In 2017, the average Twin Cities auto commuter spent 56 hours delayed in traffic throughout the year based on data from Texas Transportation Institute. For comparison, in 1990 the average was 24 hours, in 2000 the average was 48 hours, and in 2010 the average was 42 hours.

In 2017, the average Twin Cities auto commuter spent 56 hours delayed in traffic throughout the year, up from 24 hours in 1990, and similar to the 48 and 42 hours in 2000 and 2010, respectively.

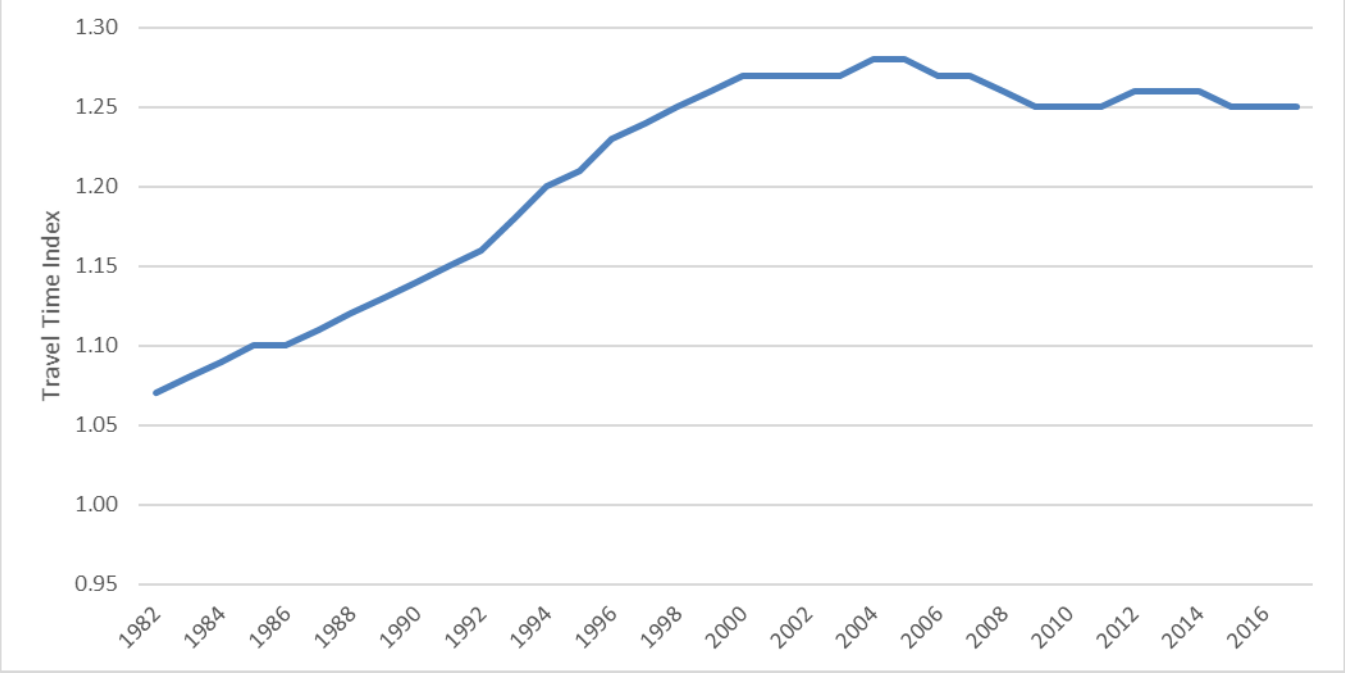
Travel Time

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 proportion of additional time that a trip takes due to congestion. A Travel Time Index of 1.30 indicates that it takes 30 percent longer to make a trip in the peak period than in off-peak conditions, when the motorist could travel at free-flow speeds.

The Travel Time Index measures the proportion of additional time that a trip takes due to congestion.

Figure 3-19 shows the Travel Time Index for the Twin Cities urban area was 1.25 in 2017, no net change from 1.25 in 2010, but down slightly from 1.27 in 2000.

Figure 3-19: Travel Time Index in The Twin Cities Region



Peer Regions

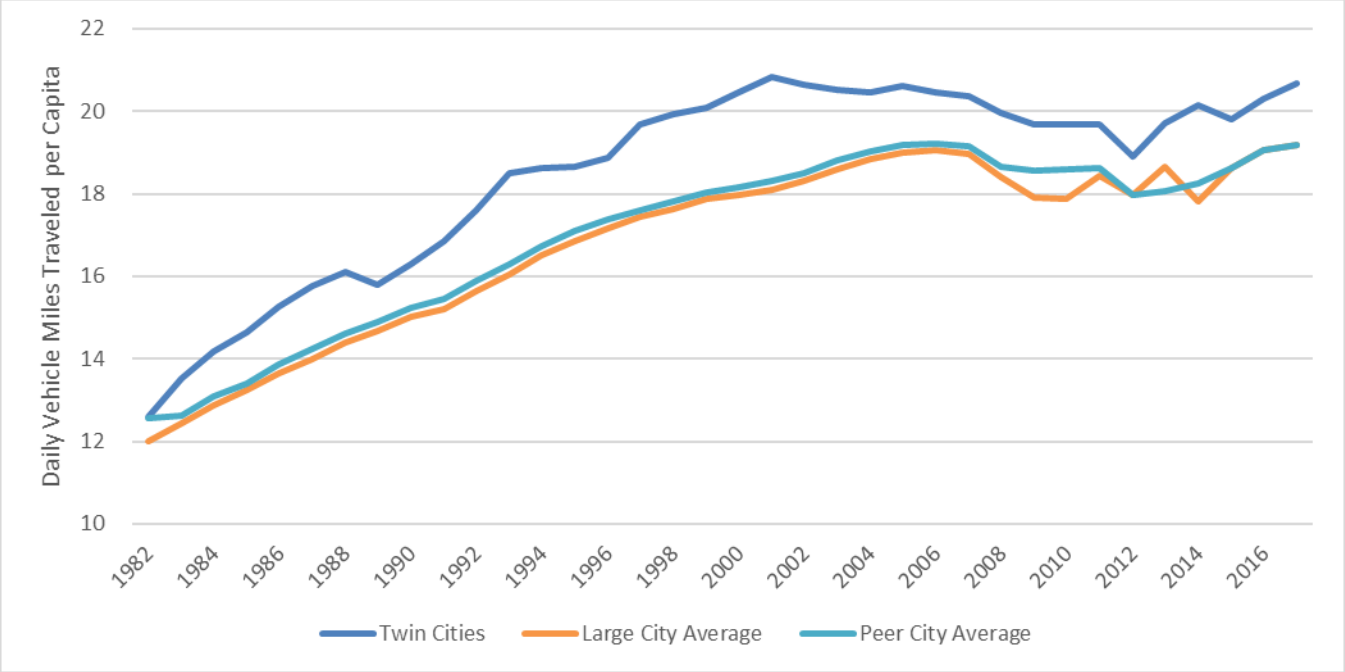
The Texas Transportation Institute compiles data on transportation system performance for metropolitan areas throughout the United States. This data can be used to measure changes in the performance of the Twin Cities' highway system over time and provide a rough comparison with other urban areas in the United States. Texas Transportation Institute considers the Twin Cities a "large urban area, " 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, Pittsburgh, Portland, Seattle and St. Louis. The most recent year for which the Texas Transportation Institute had available data was 2014. A map of highway peer cities is shown in **Figure 2-12**.

VMT per Person

Daily Vehicle Miles Traveled (VMT) per person, as measured by the Texas Transportation Institute, increased from 16 in 1990 to a peak of almost 21 daily VMT per person in 2001 in the Twin Cities Region (**Figure 3-20**). Since 2001, daily VMT per person has generally leveled off, with some year-to-year variability following the 2008 recession. Travelers in the Twin Cities region have consistently traveled one to two vehicle- miles per person per day more than averages for travelers in large cities and the region's peer cities.

Travelers in the Twin Cities region have consistently traveled one to two vehicle-miles per person per day more than averages for travelers in large cities and the region's peer cities.

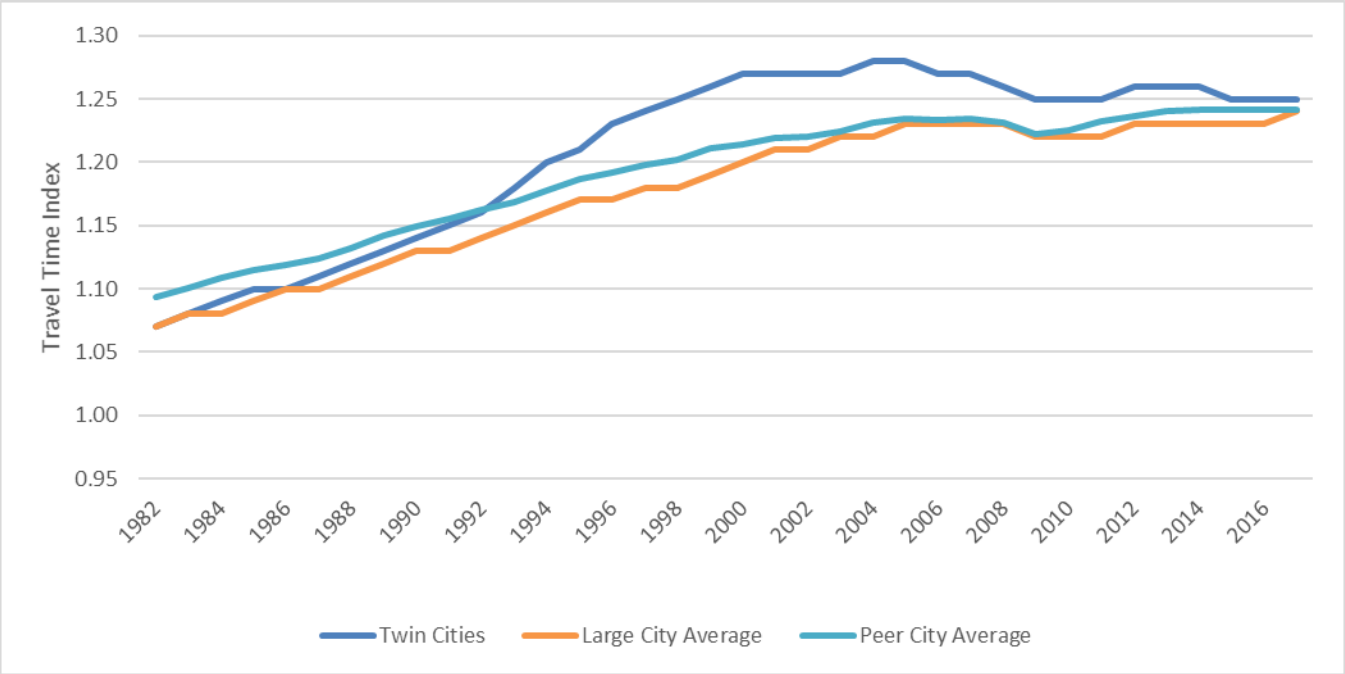
Figure 3-20: Daily Vehicle Miles Traveled per Person



Travel Time

The 2017 average Travel Time Index for the region's peer cities and for large cities was 1.24. Since 1993, the Twin Cities area has consistently had a higher Travel Time Index than the peer city and large city averages (**Figure 3-2**1).

Figure 3-21: Travel Time Index Pattern



Delay

Among the 11 peer urban areas (including the Twin Cities), the Twin Cities went from fifth lowest in 2010 to sixth lowest in 2017 in terms of annual hours of delay per auto commuter.

Between 2010 and 2017, delay for peak auto travelers in the Twin Cities increased by 19 percent, whereas the peer city and large city averages increased by 22 percent and 23 percent, respectively. **Figures 3-22** through **3-24** illustrate these findings and provide more information.

Figure 3-22: Annual Hours of Delay Per Peak Auto Commuter

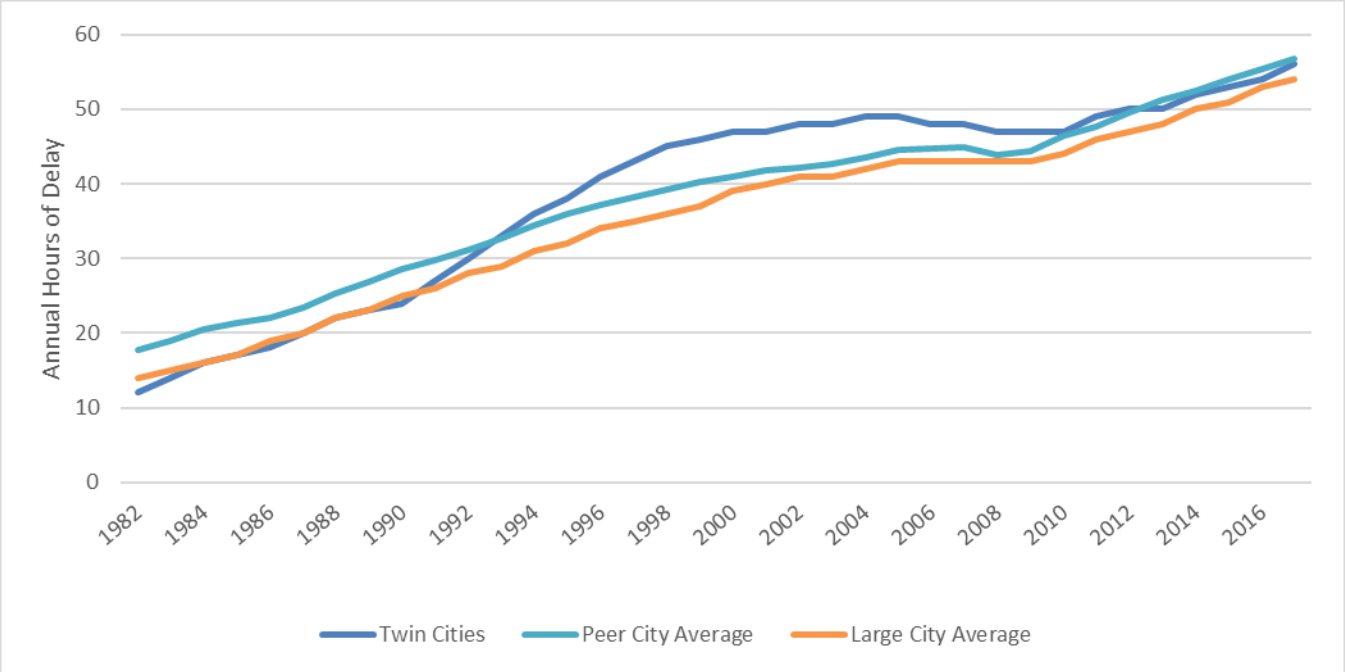


Figure 3-23: Annual Delay per Peak Commuter (1990-2017)

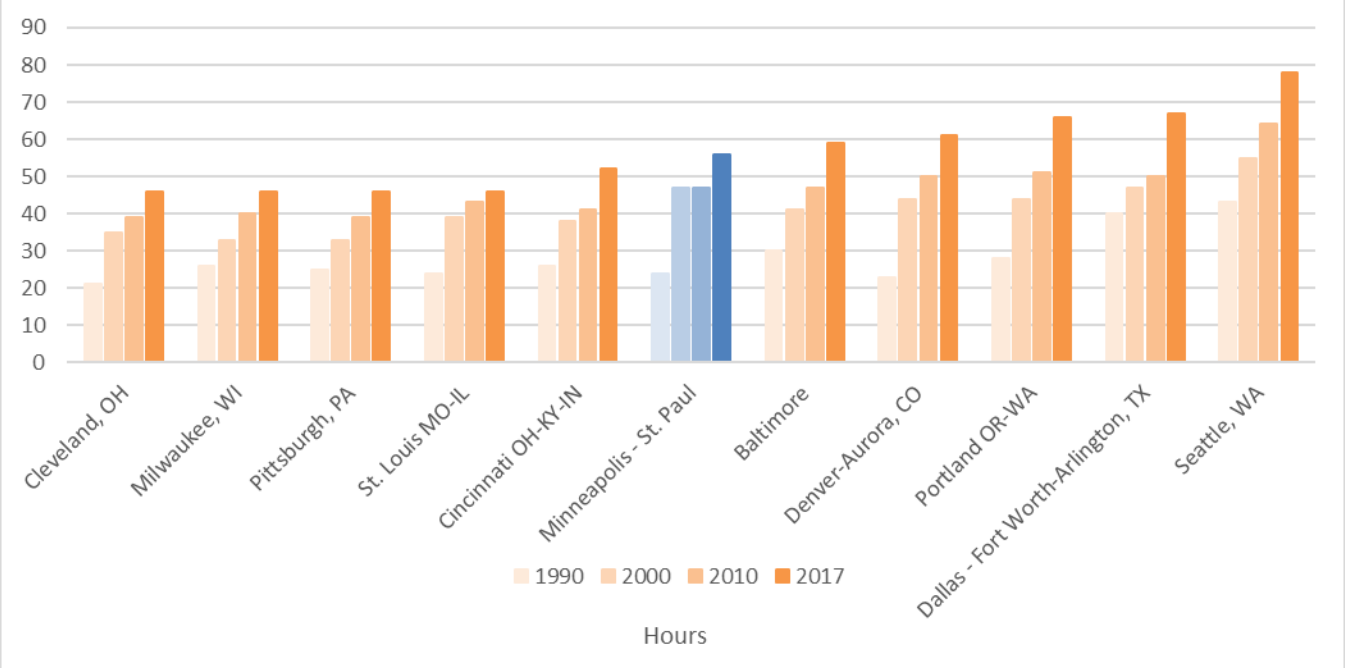
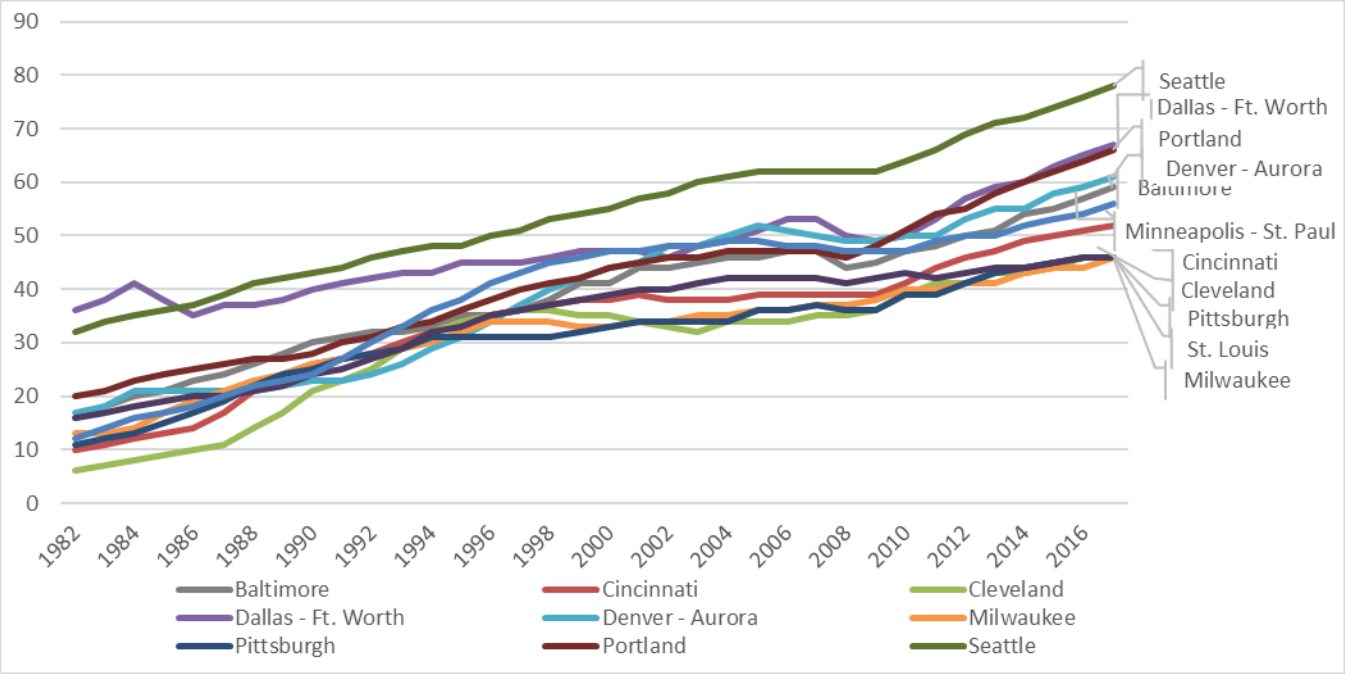


Figure 3-24: Annual Hours of Delay per Peak Auto Commuter (1982-2017)



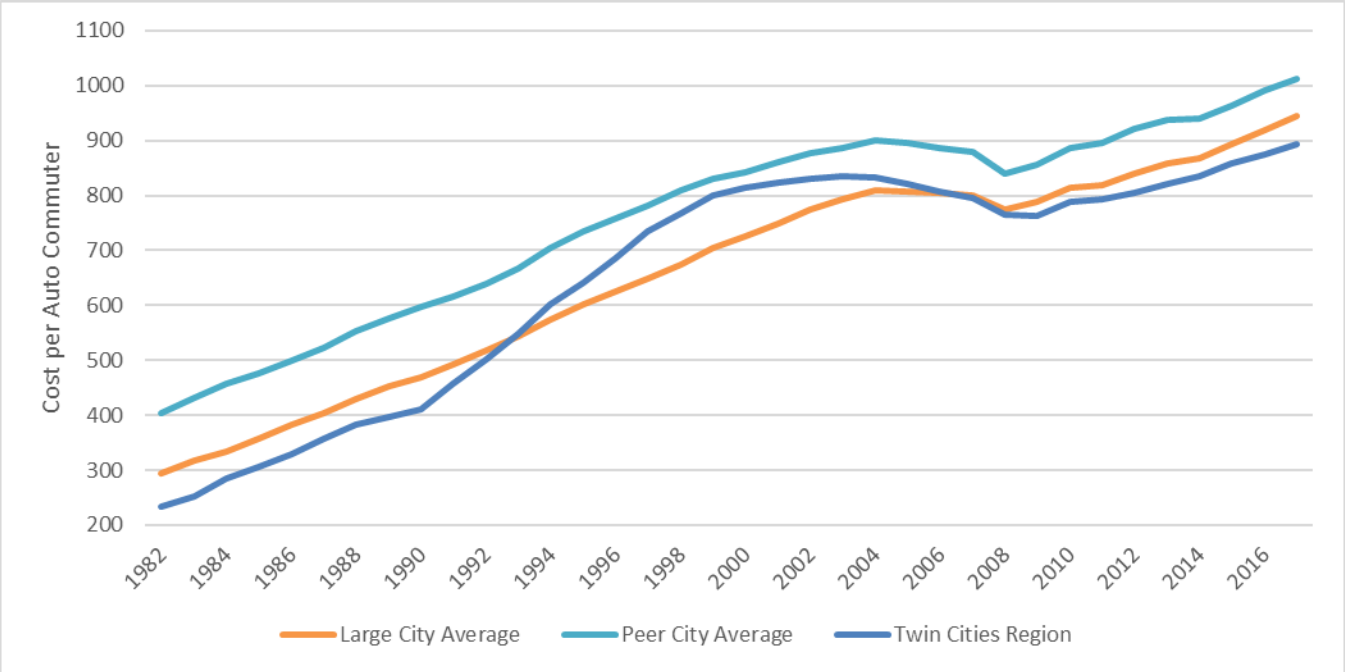
Costs of Congestion

In the Urban Mobility Report, the Texas Transportation Institute estimates the annual cost imposed by congestion. Texas Transportation Institute recently changed their methodology for calculating congestion (and consequentially, congestion cost), and as such, has revised historical values based on the updated methodology.

Based on the Texas Transportation Institute data, in 2017 the estimated cost of congestion for the Minneapolis-St. Paul region was $894 annually per auto commuter. For comparison, the average for peer cities was just under $1,012, and $945 for large areas (as published by Texas Transportation Institute). **Figure 3-25** illustrates the trend between 1982 and 2017. The annual cost increased from 1982 up to 2003 when it peaked, then dropped until 2009, where it has since began increasing.

In 2017 the estimated cost of congestion for the Minneapolis-St. Paul region was $894 annually per auto commuter.

Figure 3-25: Annual Cost of Congestion 1982 – 2017 per Auto Commuter



Findings and Conclusions

As the number of vehicles has steadily increased and highway revenues per vehicle have declined, highway performance management has needed to continue shifting toward pavement and bridge preservation, and system management strategies such as MnPASS lanes and ramp meters. The following findings and trends provide an overview of the highway system through 2018:

As the number of vehicles has steadily increased and highway revenues per vehicle have declined, highway performance management has needed to continue shifting toward pavement and bridge preservation, and system management strategies such as MnPASS lanes and ramp meters.

- Lane miles on the Principal Arterial system grew slowly between 2000 and 2018. On the minor arterial and local highway systems, the significant growth observed between 2000 and 2010 slowed decidedly between 2010 and 2014 (for appropriate comparison across years in this context, minor arterial and local highway system in the urbanized portion of Wright and Sherburne counties is not included).
- While the Principal Arterial and Minor Arterial systems comprised 26 percent of the lane-miles, they served 81 percent of the vehicle miles traveled in 2018 (including the urbanized portion of Wright and Sherburne counties).
- Roadway pavement quality in the Twin Cities Region have generally not met good or very good Ride Quality Index (RQI) targets since 2001. However, the percentage of regional principal and non-principal arterials with a poor or very poor rating has generally decreased since 2009.
- In 2017, both principal and non-principal arterial bridge ratings fell below the MnDOT performance targets for bridges in good condition. The percentage of principal arterial bridges in poor condition have met the MnDOT performance targets since 2015. The percentage of non-principal arterial bridge area in poor condition increased to a 10-year high in 2016, however, reaching approximately 7 percent and has remained at approximately this level. This trend should continue to be monitored by MnDOT and Metropolitan Council.
- Since 2010, annual VMT has generally increased each year, with the exception of a slight reduction in 2012 and 2015. VMT per person in the Twin Cities generally exceeds the average for the selected peer cities.
- Miles of directional congestion on Metro area freeways did not significantly increase between 2010 and 2014. In 2015, however, the percentage of miles of directional congestion reached a 15-year peak. Since 2015, directional congestion has increased slightly.
- Metro area MnPASS lanes provide a consistently reliable travel time, with most segments operating at 45 miles per hour or more 95 percent of the time.
- The regional travel time index has remained below the 2005 value in every one of the last 13 years, only slightly increasing between 2010 and 2014. The index has generally exceeded the peer city average, however, during this time period.
- Annual hours of delay per peak auto commuter has generally been higher in the Twin Cities compared to the selected peer cities since the 1990s; since 2010, the difference between Twin Cities average and the peer city average was essentially negligible, however.
- Annual costs of congestion have increased modestly since 2009, with the Twin Cities remaining below the peer city average.
- Some highway system measures appear to be a cause for concern, such as increasing vehicle miles traveled and number of congested miles. However, stable results for highway user measures such as delay per user, travel time index, and cost of congestion show that individual highway user experiences differ from trends for overall highway system performance. Highway users may be avoiding congested times and places by leveraging the flexibility offered by a higher share of retired population and greater flexibility offered by employers in work schedules and telecommuting availability.

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Chapter 4: The Transit System

Transit in the Twin Cities

Operations

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

- Light rail transit (LRT) service is provided by electrically powered trains operating at high frequencies primarily on exclusive rights-of-way. Light rail uses specially designed transit stations and amenities. The Twin Cities region has two light rail lines: METRO Blue Line, providing service from MSP International Airport to downtown Minneapolis along Hiawatha Avenue, and METRO Green Line, providing service from downtown Saint Paul to downtown Minneapolis along University Avenue.
- Commuter rail service operates on traditional railroad track powered by diesel trains with limited stops. The Twin Cities has one commuter rail line, Northstar, which provides peak-commuter oriented service in the Northwest of the region between Minneapolis and Big Lake.
- Bus rapid transit (BRT) service is provided at high frequencies with unique buses and specially designed facilities and amenities similar to light rail. The region is currently served by two types of BRT service, Highway BRT and Arterial BRT. METRO Red Line is the region's only Highway BRT service, traveling along Cedar Avenue between the Mall of America and Apple Valley Transit Station. The region is served by two Arterial BRT lines, METRO A Line which provides service along Snelling Avenue and METRO C Line, which began service in 2019 and provides service along Penn Avenue.
- Regular-route bus service is provided on a fixed schedule along specific routes, with vehicles stopping to pick up and drop off passengers at designated locations. The region has five public transit service providers that operate regular route bus service in the region. The University of Minnesota also provides regular route bus service on its campus.
- Dial-a-ride 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.
- Regional transit service providers have piloted microtransit services. These services provide on demand service that can be requested via smartphone app, website or phone call. These services do not follow a fixed route and provide service between an origin and destination of the passenger's choosing. Unlike traditional Dial-a-Ride services, trips do not have to be scheduled in advance.
- 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.

Transit Performance Measures by Service Provider

Metropolitan Council

The Metropolitan Council provides public transit service through two of its operating divisions: Metro Transit and Metropolitan Transportation Services**. Figure 4-1** shows the routes as of February 2020.

Metro Transit

Metro Transit is the largest provider of regular-route transit service in the Minneapolis/St. Paul metropolitan area and operates regular route bus service, light rail transit service, commuter rail service and bus rapid transit service.

Metro Transit Regular Route Bus

In December 2018, Metro Transit provided direct service on 121 routes – 49 local routes and 72 express routes.

Table 4-1: 2018 Operating Statistics: Metro Transit Regular Route Bus

Service	Operating Cost	Fare Revenue	Farebox Recovery	Ridership	In-Service Hours	Subsidy per Pass.	Pass. Per In-Service Hour
Commuter & Express Bus	$59,381,162	$18,872,031	31.8%	8,167,931	251,210	$4.96	32.5
Core Local	$213,852,270	$38,075,913	17.8%	39,665,595	1,170,471	$4.43	33.9
Suburban Local	$14,108,908	$1,825,793	12.9%	2,054,488	70,524	$5.98	29.1
Supporting Local	$19,546,617	$1,918,424	9.8%	2,068,665	99,078	$8.52	20.9
Metro Transit Bus Total	**$306,888,958**	**$60,692,161**	**19.8%**	**51,956,679**	**1,591,282**	**$4.74**	**32.7**

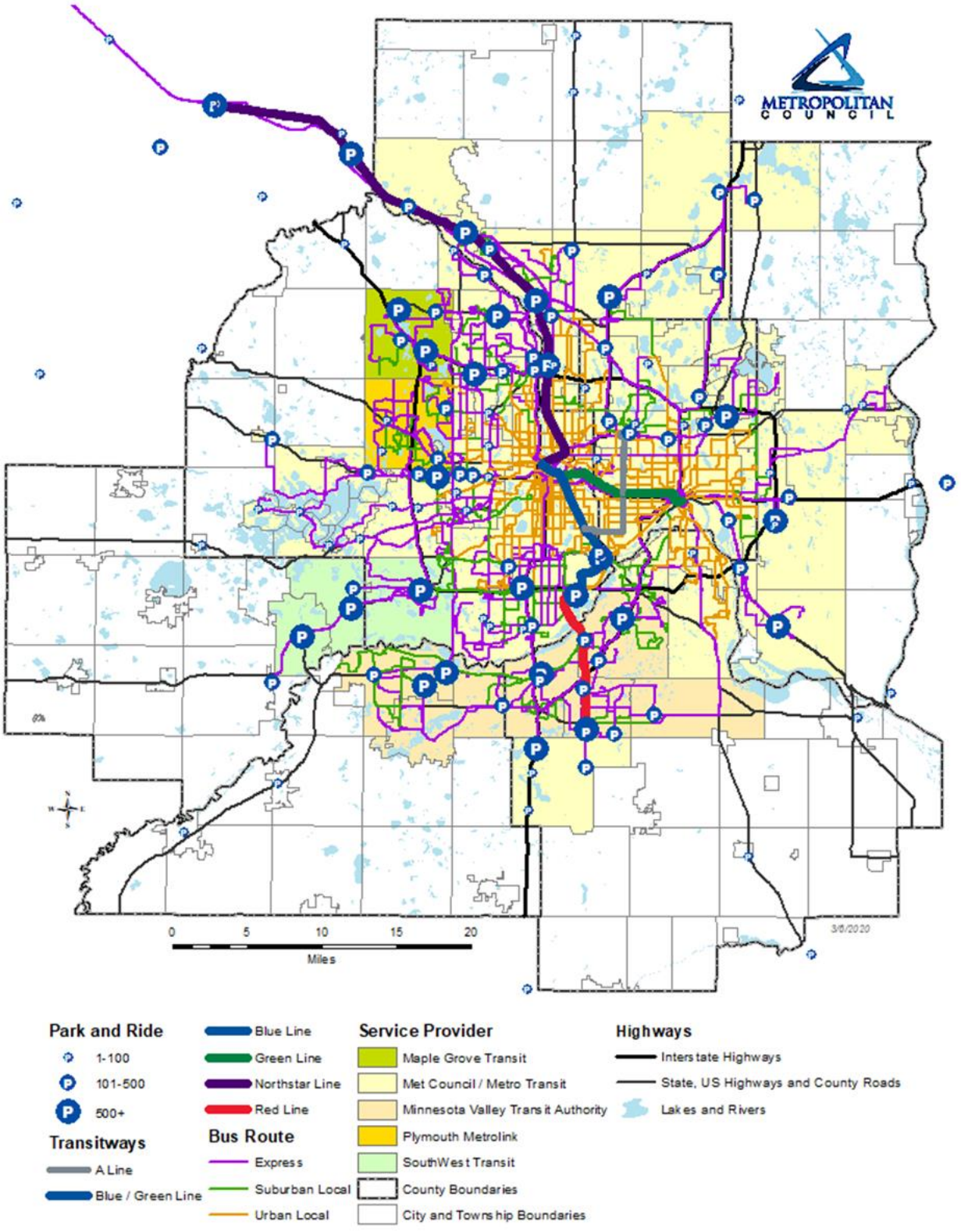
Light Rail Transit

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. Metro Transit opened the METRO Green Line between St. Paul and Minneapolis in 2014. The Green Line serves 18 stations and five stations that are shared with METRO Blue Line. Metro Transit is in the process of extending both light rail lines.

Table 4-2: 2018 Operating Statistics: Metro Transit Light Rail

Service	Operating Cost	Fare Revenue	Farebox Recovery	Ridership	In-Service Hours	Subsidy per Pass.	Pass. Per In-Service Hour
Light Rail	$73,123,680	$26,713,177	36.5%	24,955,618	117,621	$1.86	212.2

Figure 4-1: Existing Transit System in the Twin Cities Region



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, and an additional station was completed in Ramsey in November 2012. The line operates with six locomotives and 18 passenger cars that are maintained at a service facility in Big Lake.

Table 4-3: 2018 Operating Statistics: Metro Transit Commuter Rail

Service	Operating Cost	Fare Revenue	Farebox Recovery	Ridership	In-Service Hours	Subsidy per Pass.	Pass. Per In-Service Hour
Commuter Rail	$16,213,833	$2,631,695	16.2%	787,327	3,191	$17.25	246.7

Bus Rapid Transit

The region's first arterial BRT line, the A Line, opened in 2016 along Snelling Avenue, Ford Parkway, and 46th Street; the second, the C Line, began operation along Penn Avenue in 2019. The D Line providing service along Chicago Avenue is currently under development, Emerson, and Fremont Avenues. Metro Transit is also leading development of the region's second highway BRT service, the METRO Orange Line. The METRO Orange Line, planned to open in 2021, will connect Minneapolis and other communities along the I-35W corridor south of downtown.

Table 4-4: 2018 Operating Statistics: Metro Transit Bus Rapid Transit (BRT)

Service	Operating Cost	Fare Revenue	Farebox Recovery	Ridership	In-Service Hours	Subsidy per Pass.	Pass. Per In-Service Hour
Arterial BRT	$8,218,440	$1,755,637	21.4%	1,618,203	37,722	$3.99	42.9

Metropolitan Transportation Services

The Metropolitan Transportation Services (MTS) division of Metropolitan Council oversees or operates several kinds of public transit service.

MTS Contracted Regular Route Bus

In 2018, Metropolitan Council provided bus service on 28 routes through five contracts with private transportation companies. All contracts are similar in size based on the number of contracted hours. Contracted service is used primarily to provide service using buses smaller than a typical 40-foot bus and is often provided in suburban areas.

Table 4-5: 2018 Operating Statistics: Metropolitan Council Contracted Regular Route Bus

Service	Operating Cost	Fare Revenue	Farebox Recovery	Ridership	In-Service Hours	Subsidy per Pass.	Pass. Per In-Service Hour
Commuter & Express Bus	$1,082,359	$229,956	21.2%	104,165	6,891	$8.18	15.1
Suburban Local	$8,273,053	$1,495,757	18.1%	1,277,639	103,098	$5.30	12.4
Supporting Local	$4,132,414	$783,010	18.9%	760,916	53,368	$4.40	14.3
MTS Total	**$13,487,826**	**$2,508,724**	**18.6%**	**2,142,720**	**163,358**	**$5.12**	**13.1**

Bus Rapid Transit

The METRO Red Line, the region's first highway BRT line, opened in 2013. The Red Line runs on Cedar Avenue between the Mall of America and Apple Valley Transit Station and is operated by the Minnesota Valley Transit Authority (MVTA) under contract to MTS. The Red Line is complemented by extensive express bus service in the corridor that provide a variety of options for travelers.

Table 4-6: Operating Statistics Metropolitan Council Contracted Highway BRT

Service	Operating Cost	Fare Revenue	Farebox Recovery	Ridership	In-Service Hours	Subsidy per Pass.	Pass. Per In-Service Hour
Highway BRT	$2,535,853	$217,044	8.6%	254,125	12,060	$9.12	21.1

Metro Mobility

Metropolitan Transportation Services provides Metro Mobility service as required by the Americans with Disabilities Act (ADA) to persons whose disabilities prevent them from using the regular-route transit system. This act requires transit agencies provide dial-a-ride service to people with disabilities within ¾ mile of fixed-route transit service with a comparable level of service. Minnesota State 473.386 requires service beyond the requirements of Federal law, the required service area within the Twin Cities is shown in **Figure 4-2**. Metro Mobility was recently restructured to improve customer service, reduce duplication, and improve efficiency. Metro Mobility transitioned from three county contracts and two core contracts to three large service contracts. Service is now provided by two private companies.

The aging regional population is one factor that has driven increased paratransit usage. Between 2010 and 2018, Metro Mobility saw a ridership increase of 57 percent, from 1.52 million rides in 2010 to 2.38 million rides in 2018. The growing elderly population will continue to increase demand for paratransit service in the future.

Table 4-7: 2018 Operating Statistics: Metropolitan Council Metro Mobility

Service	Operating Cost	Fare Revenue	Farebox Recovery	Ridership	In-Service Hours	Subsidy per Pass.	Pass. Per In-Service Hour
Metro Mobility	$74,512,361	$7,976,511	10.7%	2,381,781	1,435,798	$27.94	1.7

Transit Link

Transit Link is a region-wide contracted service that was started in 2010 after significant stakeholder input. With the introduction of Transit Link, the Council phased out annual subsidies to locally controlled, community-based dial-a-ride programs and replaced it with a coordinated and uniform program available regionwide. The Transit Link program provides rides in parts of the region not served by regular route transit and connects people to the closest regular route stop or station that will provide service to their destination.

Table 4-8: 2018 Operating Statistics: Metropolitan Council General Demand Response

Service	Operating Cost	Fare Revenue	Farebox Recovery	Ridership	In-Service Hours	Subsidy per Pass.	Pass. Per In-Service Hour
Transit Link	$7,007,241	$957,534	13.7%	243,857	109,827	$24.81	2.2

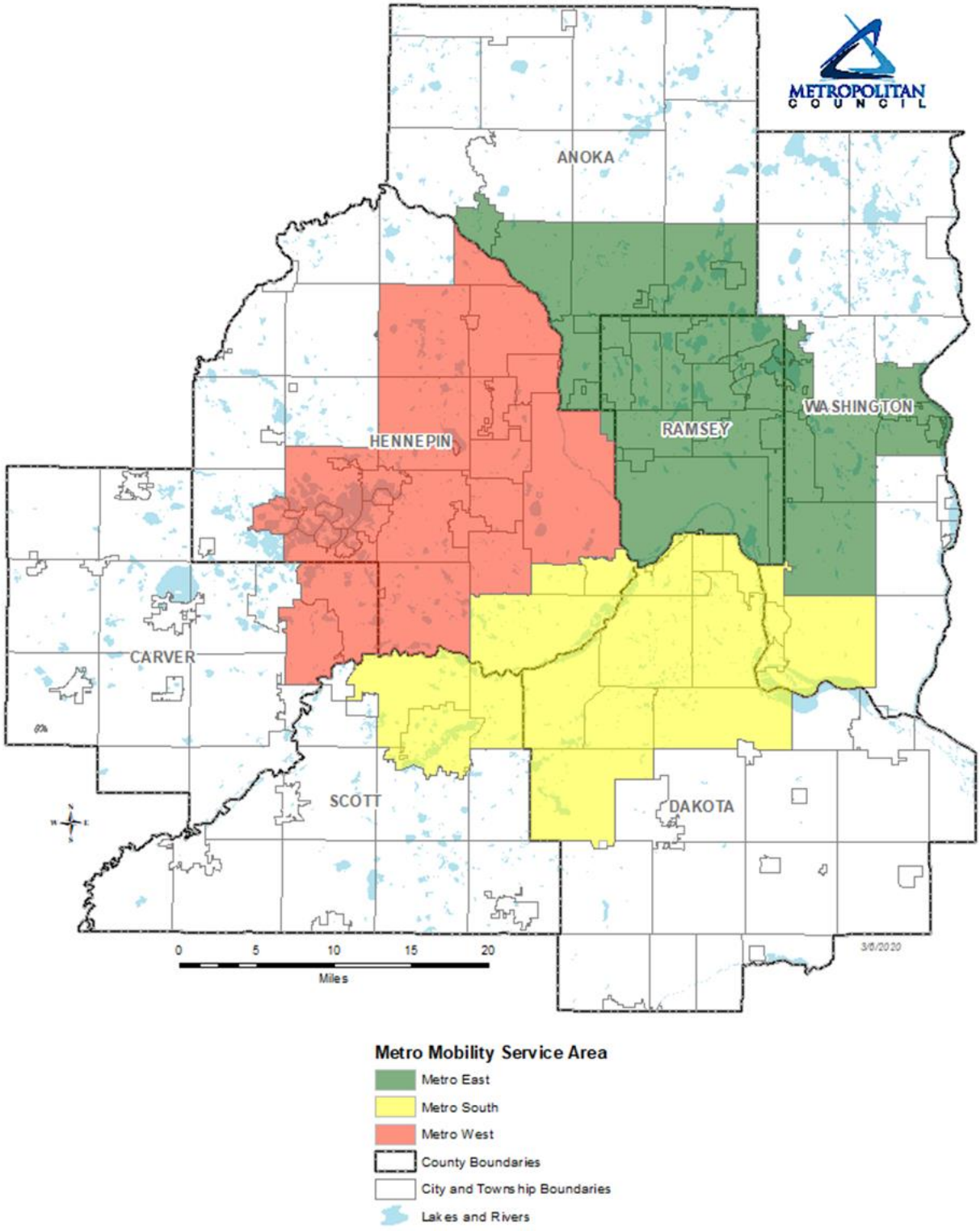
Metro Vanpool

Metro Vanpool is a commuter vanpool program subsidized by the Metropolitan Council and overseen by MTS. This program started in 2001 as a way of providing transit service for people living or working in areas not served by regular- route bus service. People driving long distances from low-density areas add a disproportionate number of vehicle miles traveled (VMT), so removing or reducing these trips on the road network leads to significant benefits in terms of traffic congestion, air pollution, and greenhouse gas emissions.

Table 4-9: 2018 Operating Statistics: Metropolitan Council Commuter Vanpool

Service	Operating Cost	Fare Revenue	Farebox Recovery	Ridership	In-Service Hours	Subsidy per Pass.	Pass. Per In-Service Hour
Commuter Van Pool	$833,156	$563,125	67.6%	117,252	31,763	$2.30	3.7

Figure 4-2: Metro Mobility Service Areas



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, the legislature authorized cities to retain up to 90 percent of the property tax levied in their communities to "opt out" of Metro Transit service and to provide transit service independent of Metro Transit. Twelve cities chose to provide their own transit service through the legislation. Today, through agreements and consolidations, the region includes four suburban transit providers (**Figure 4-3**).

Minnesota Valley Transit Authority

MVTA was established as a Joint Powers Board in 1990 and serves the residents and businesses of Apple Valley, Burnsville, Eagan, Prior Lake, Rosemount, Savage, and Shakopee. At the end of 2018, MVTA operated a total of 32 routes: three flex-routes and/or shuttles operating in the suburban area, 15 express routes into downtown Minneapolis, two express routes into downtown St. Paul, and 11 local routes. Five of these routes offer peak-period reverse-commute services. MVTA operates services to 14 park-and-ride facilities out of two bus garages.

Table 4-10: 2018 Operating Statistics: Minnesota Valley Transit Authority

Service	Operating Cost	Fare Revenue	Farebox Recovery	Ridership	In-Service Hours	Subsidy per Pass.	Pass. Per In-Service Hour
Commuter & Express Bus	$16,813,598	$4,760,773	28.3%	1,927,871	89,648	$6.25	21.5
Suburban Local	$7,913,979	$666,383	8.4%	604,306	64,823	$11.99	9.3
MVTA Total	**$24,727,576**	**$5,427,156**	**21.9%**	**2,532,177**	**154,471**	**$7.62**	**16.4**

SouthWest Transit

SouthWest Transit's express services are oriented toward downtown Minneapolis and the University of Minnesota. SouthWest Transit also offers reverse commute express service and SW Prime - its on-demand local service. At the end of 2018, SouthWest Transit operated seven express routes, a suburban local flex route, SouthWest Prime – its microtransit service, and also operated special event services to the Minnesota State Fair and to sporting events throughout 2018. Service is provided from five park-and-ride facilities.

Table 4-11: 2018 Operating Statistics: SouthWest Transit

Service	Operating Cost	Fare Revenue	Farebox Recovery	Ridership	In-Service Hours	Subsidy per Pass.	Pass. Per In-Service Hour
Commuter & Express Bus	$8,779,671	$2,373,780	27.0%	856,461	33,828	$7.48	25.3
Suburban Local	$839,951	$99,146	11.8%	40,219	3,939	$18.42	10.2
General Demand Response	$1,081,137	$240,778	22.3%	102,511	29,509	$8.20	3.5
SW Transit Total	**$10,700,759**	**$2,713,704**	**25.4%**	**999,191**	**67,276**	**$7.99**	**14.9**

Maple Grove Transit

Maple Grove Transit was formed in June 1990 to serve the city of Maple Grove. In 2018 Maple Grove Transit operated six commuter bus routes, two local shuttle routes and MyRide, its general-purpose Dial-a-Ride service. Maple Grove has five commuter routes providing service to downtown Minneapolis and one route providing service to the University of Minnesota.

Table 4-12: 2018 Operating Statistics: Maple Grove Transit

Service	Operating Cost	Fare Revenue	Farebox Recovery	Ridership	In-Service Hours	Subsidy per Pass.	Pass. Per In-Service Hour
Commuter & Express Bus	$3,954,990	$2,201,471	55.7%	791,036	18,961	$2.22	41.7
Suburban Local	$131,083	$9,703	7.4%	9,064	718	$13.39	12.6
General Demand Response	$788,760	$52,770	6.7%	36,568	10,913	$20.13	3.4
Maple Grove Transit Total	**$4,874,832**	**$2,263,944**	**46.4%**	**836,668**	**30,592**	**$3.12**	**27.3**

Plymouth Metrolink

Operated by the City of Plymouth since 1984, Plymouth Metrolink provides high-quality, safe and cost-effective transit services focused on customer satisfaction. Services include commuter express routes, local shuttles and Dial-A-Ride that services within Plymouth and other local destinations. Plymouth Metrolink operates six commuter routes serving downtown Minneapolis, one of which also serves the University of Minnesota and three reverse commute routes from Minneapolis.

Table 4-13: 2018 Operating Statistics: Plymouth Metrolink

Service	Operating Cost	Fare Revenue	Farebox Recovery	Ridership	In-Service Hours	Subsidy per Pass.	Pass. Per In-Service Hour
Commuter & Express Bus	$3,172,490	$1,076,342	33.9%	463,031	22,513	$4.53	20.6
Suburban Local	$491,412	$13,187	2.7%	28,792	3,852	$16.61	7.5
General Demand Response	$1,147,968	$65,180	5.7%	27,514	9,422	$39.35	2.9
Plymouth Metrolink Total	**$4,811,870**	**$1,154,709**	**24.0%**	**519,337**	**35,787**	**$7.04**	**14.5**

Other Providers

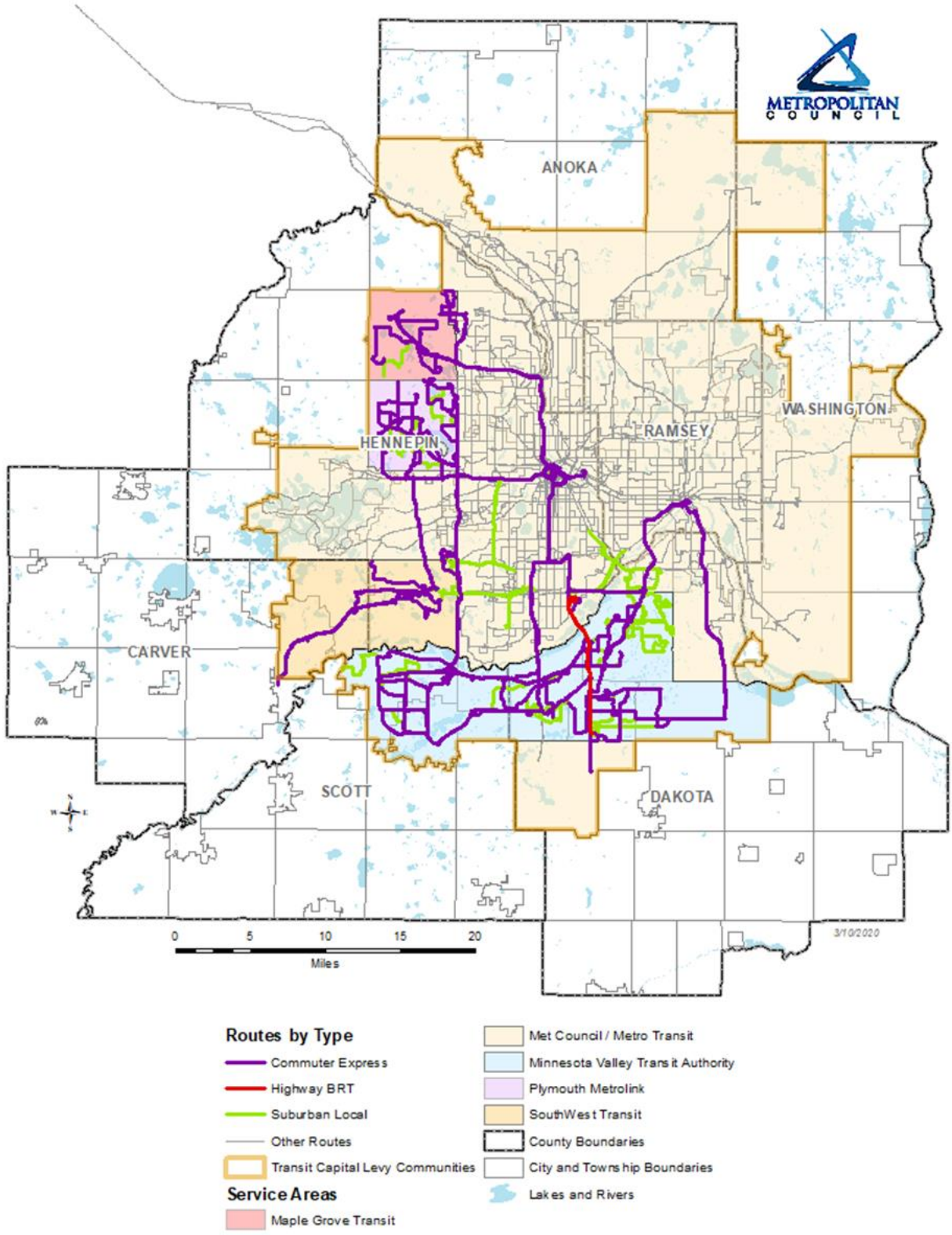
University of Minnesota Parking and Transportation Service

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

Table 4-14: 2018 Operating Statistics: University of Minnesota Transit

Service	Operating Cost	Fare Revenue	Farebox Recovery	Ridership	In-Service Hours	Subsidy per Pass.	Pass. Per In-Service Hour
Bus	$5,321,793	-	-	3,944,534	51,960	$1.35	75.9
Demand Response	$325,514	-	-	10,218	5,537	$31.86	1.8
U of M Total	**$5,647,307**	**-**	**-**	**3,954,752**	**57,497**	**$1.43**	**68.8**

Figure 4-3: Suburban Transit and Suburban Transit Service Providers



Summary of Transit System Statistics

Ridership

Regional transit ridership has fluctuated over the past five years. Ridership on the regional transit system peaked in 2015 and has declined every year since. 2018 saw a ridership decline of 1.45 million riders from the previous year, a 2% decline. In 2018, Metro Transit carried 85% of regional riders, the University of Minnesota's transit service carried 4%, MTS Contracted service carried 2%, Suburban providers carried 6%, while DAR and Vanpool services carried the remaining 3%.

Table 4-15: Transit Ridership by Service Provider, 2013-2018

Service	2013	2014	2015	2016	2017	2018
Metro Transit Bus	68,466,770	67,026,209	60,810,940	56,750,724	54,318,129	51,956,679
Metro Transit Light Rail	10,162,919	15,999,994	23,003,457	22,963,629	23,810,995	24,955,618
Metro Transit Commuter Rail	787,239	721,215	722,637	711,167	793,796	787,327
Arterial BRT	-	-	-	854,567	1,631,686	1,618,203
MTS Contracted Regular Route	3,170,135	2,740,525	2,458,932	2,361,452	2,242,733	2,142,720
Highway Bus Rapid Transit	130,733	265,515	265,410	266,811	270,400	254,125
Metro Mobility	1,817,561	1,975,625	2,109,391	2,233,229	2,256,154	2,381,781
MTS Dial-a-Ride	341,018	336,039	326,081	302,667	286,325	243,857
Vanpool	186,433	176,527	165,442	166,761	149,904	117,252
Suburban Transit Providers	4,986,124	5,212,112	5,096,498	4,922,463	4,946,298	4,887,373
Subtotal	90,048,932	94,453,761	94,958,788	91,533,470	90,706,420	89,344,935
UMN	2,916,536	3,206,582	3,201,892	3,724,133	4,045,807	3,954,752
Regional Total	**92,965,468**	**97,660,343**	**98,160,680**	**95,257,603**	**94,752,227**	**93,299,687**

Statistic Summaries by Provider

Table 4-16 provides a summary of key metrics for all transit providers and their services for the year 2018. Subsidy per passenger and passengers per in-service hour are measures of productivity and cost effectiveness, respectively, established in Appendix G of the 2040 Transportation Policy Plan. These metrics are used to evaluate the relative productivity and efficiency of the services provided.

Table 4-16: 2018 Regional Transit Operating Statistics by Provider

Service	Operating Cost	Fare Revenue	Farebox Recovery	Ridership	In-Service Hours	Subsidy per Pass.	Pass. Per In-Service Hour
Metropolitan Council - Directly Operated							
Metro Transit Bus	$306,888,958	$60,692,161	19.8%	51,956,679	1,591,282	$4.74	32.7
Metro Transit Light Rail	$73,123,680	$26,713,177	36.5%	24,955,618	117,621	$1.86	212.2
Metro Transit Commuter Rail	$16,213,833	$2,631,695	16.2%	787,327	3,191	$17.25	246.7
Arterial BRT	$8,218,440	$1,755,637	21.4%	1,618,203	37,722	$3.99	42.9
Metro Transit Subtotal	**$404,444,911**	**$91,792,669**	**22.7%**	**79,317,827**	**1,749,817**	**$3.94**	**45.3**
Metropolitan Council - MTS Contracted							
Contracted Regular Route	$13,487,826	$2,508,724	18.6%	2,142,720	163,358	$5.12	13.1
Highway BRT	$2,535,853	$217,044	8.6%	254,125	12,060	$9.12	21.1
Metro Mobility	$74,512,361	$7,976,511	10.7%	2,381,781	1,435,798	$27.94	1.7
Transit Link	$7,007,241	$957,534	13.7%	243,857	109,827	$24.81	2.2
Metro Vanpool	$833,156	$563,125	67.6%	117,252	31,763	$2.30	3.7
MTS Subtotal	**$98,376,437**	**$12,222,938**	**12.4%**	**5,139,735**	**1,752,806**	**$16.76**	**2.9**

Other Transit Providers

MVTA	$24,727,576	$5,427,156	21.9%	2,532,177	154,471	$7.62	16.4
SouthWest Transit	$10,700,759	$2,713,704	25.4%	999,191	67,276	$7.99	14.9
Maple Grove Transit	$4,874,832	$2,263,944	46.4%	836,668	30,592	$3.12	27.3
Plymouth Metrolink	$4,811,870	$1,154,709	24.0%	519,337	35,787	$7.04	14.5
University of Minnesota	$5,647,307	-	-	3,954,752	57,497	$1.43	68.8
Non-Metropolitan Council Subtotal	**$50,762,344**	**$11,559,513**	**22.8%**	**8,842,125**	**345,622**	**$4.43**	**25.6**
Regional Total	**$553,583,692**	**$115,575,120**	**20.9%**	**93,299,687**	**3,848,245**	**$4.69**	**24.2**

Statistic Summaries by Service Type

Table 4-17 provides a summary of key metrics for all transit providers and their services for the year 2018. Subsidy per passenger and passengers per in-service hour are measures of productivity and cost effectiveness, respectively, established in Appendix G of the 2040 Transportation Policy Plan. These metrics are used to evaluate the relative productivity and efficiency of the services provided.

Table 4-17: Performance Metrics by Service Type, 2018

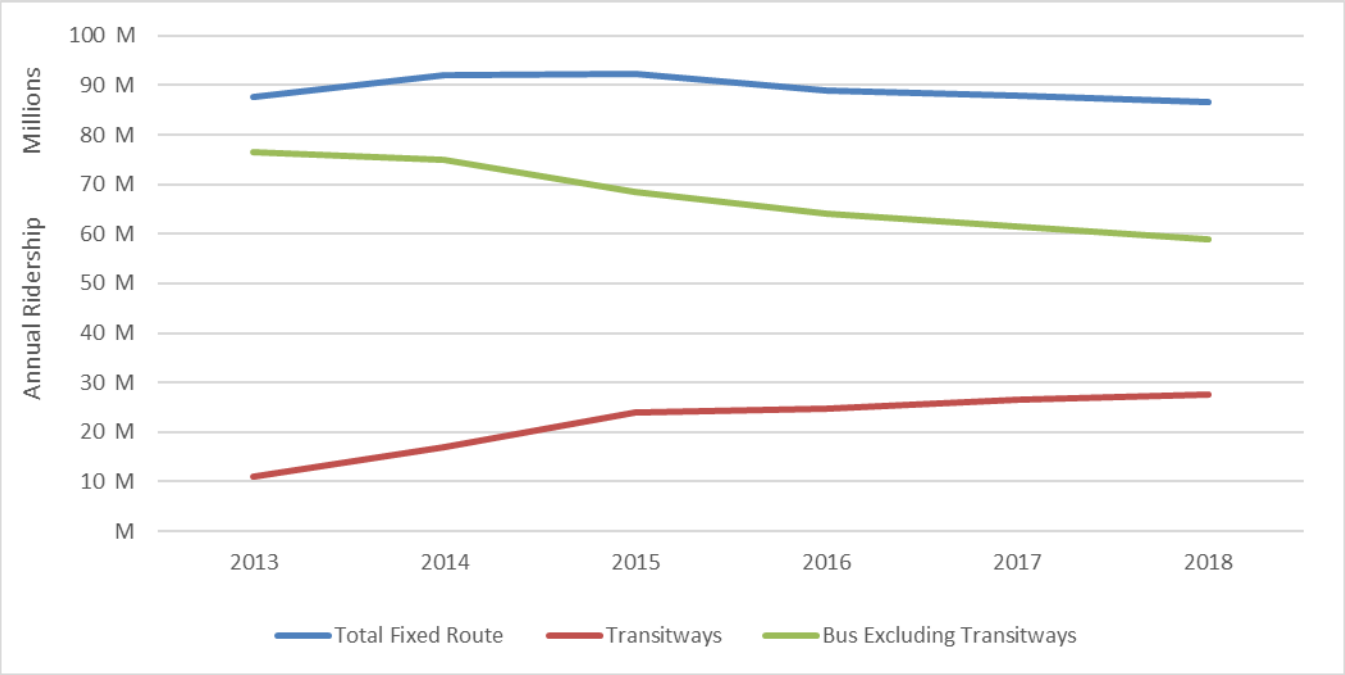
Service	Operating Cost	Fare Revenue	Farebox Recovery	Ridership	In-Service Hours	Subsidy per Pass.	Pass. Per In-Service Hour
Core Local Bus	$219,499,577	$38,075,913	17.3%	43,620,347	1,227,968	$4.16	35.5
Supporting Local Bus	$23,679,031	$2,701,434	11.4%	2,829,581	152,447	$7.41	18.6
Suburban Local Bus	$31,758,386	$4,109,970	12.9%	4,014,508	246,953	$6.89	16.3
Commuter & Express Bus	$93,184,269	$29,514,353	31.7%	12,310,495	423,051	$5.17	29.1
Regular Route Bus Subtotal	**$368,121,263**	**$74,401,669**	**20.2%**	**62,774,931**	**2,050,419**	**$4.68**	**30.6**
Light Rail	$73,123,680	$26,713,177	36.5%	24,955,618	117,621	$1.86	212.2
Commuter Rail	$16,213,833	$2,631,695	16.2%	787,327	3,191	$17.25	246.7
Arterial BRT	$8,218,440	$1,755,637	21.4%	1,618,203	37,722	$3.99	42.9
Highway BRT	$2,535,853	$217,044	8.6%	254,125	12,060	$9.12	21.1
ADA Dial-a-Ride	$74,512,361	$7,976,511	10.7%	2,381,781	1,435,798	$27.94	1.7
General Dial-a-Ride	$10,025,106	$1,316,262	13.1%	410,450	159,671	$21.22	2.6
Vanpool	$833,156	$563,125	67.6%	117,252	31,763	$2.30	3.7
Regional Total	**$553,583,692**	**$115,575,120**	**20.9%**	**93,299,687**	**3,848,245**	**$4.69**	**24.2**

Transit Performance Measure Trends

Ridership

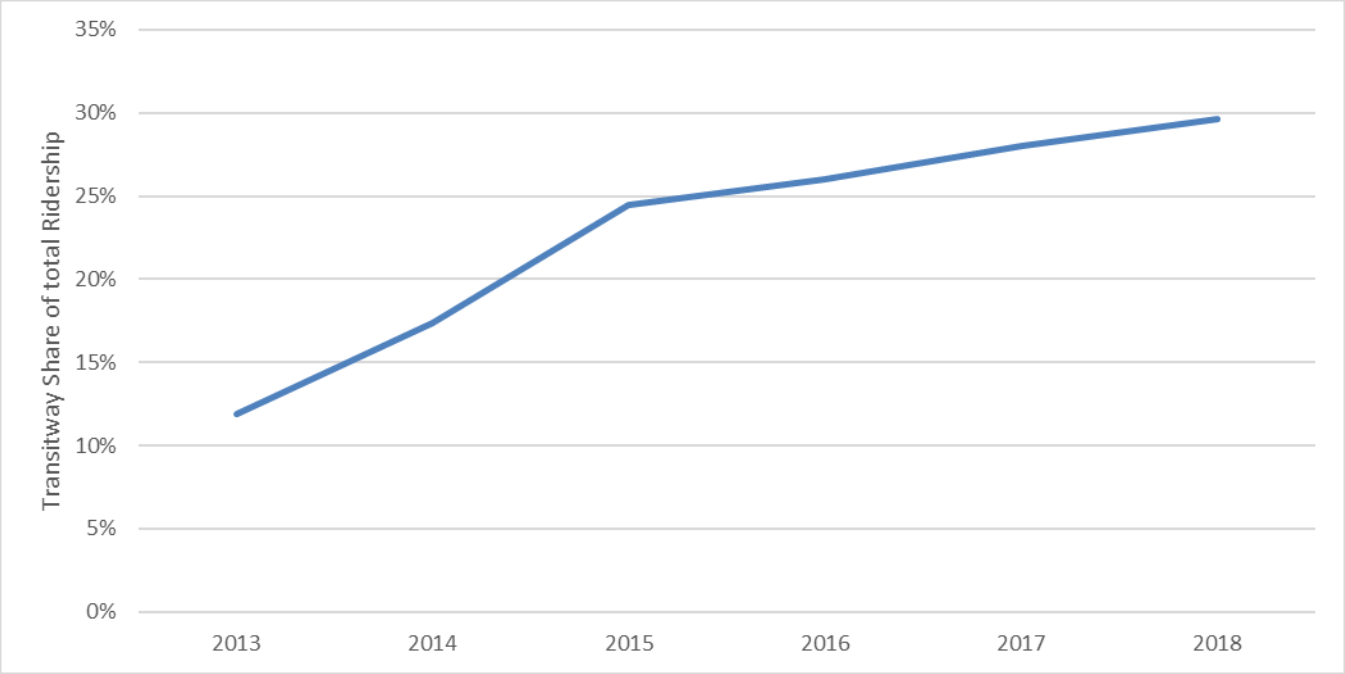
Overall fixed-route ridership has fluctuated since 2013, peaking in 2015 and declining every year since. remained relatively stable, seeing an increase of 3% since 2013, but down 4% from its peak in 2015 (**Figure 4-4**). This trend is driven by an increase in transitway (light rail, commuter rail, bus rapid transit) ridership but a decrease in bus ridership excluding transitways. A substantial portion of the decline in bus ridership was a shift from bus to rail when the Green Line opened.

Figure 4-4: Annual Ridership, 2013-2018



The transitway system continues to perform strongly, highlighting its vital role in the region's transportation network. Transitway ridership has increased from 11,080,091 in 2013 to 27,615,273 in 2018, now making up 30 percent of overall transit ridership (**Figure 4-5**). Though this increase has been driven by the expansion of the system to include METRO Green Line and A Line, all transitways have seen increases in ridership.

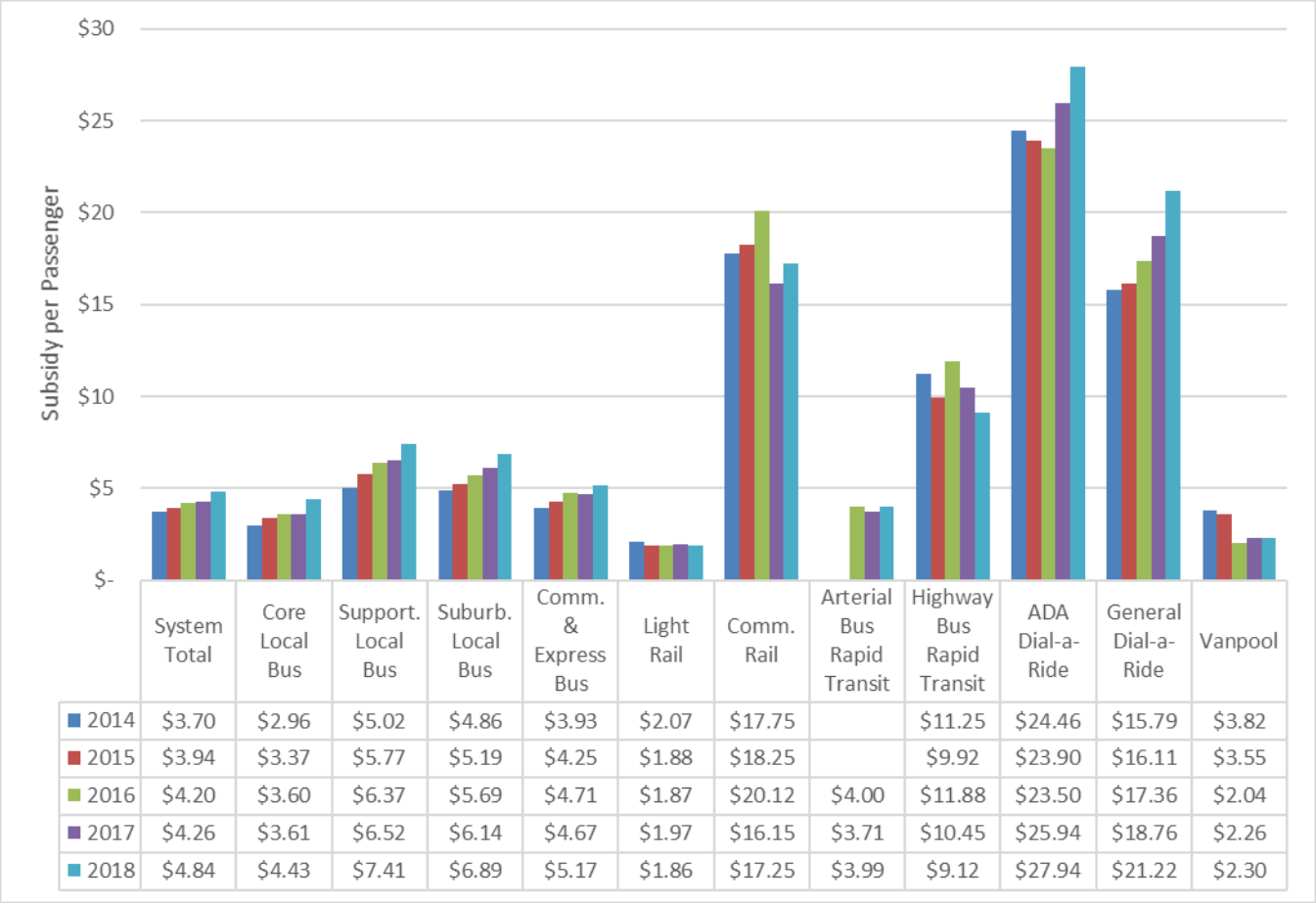
Figure 4-5: Transitway Share of Total Ridership



Subsidy per Passenger

Subsidy per passenger measures the cost-effectiveness of transit service as a ratio of operating subsidy required per passenger carried. Operating subsidy is the net cost of providing service, after accounting for fare revenue. In 2018, the regional total was $4.84, up from $3.70 in 2014 (**Figure 4-6**). Subsidy per passenger is generally expected to increase with inflation but other factors, such as fare revenue and ridership, can influence trends. Fares were increased in October 2017, the first fare increase in eight years. The full effect of this fare increase will take time to assess, but fare increases typically increase farebox recovery and decrease subsidy per passenger. Light rail is the most cost-effective service in the region with a subsidy per passenger of $1.86. ADA dial-a-ride, general dial-a-ride, and commuter rail are the least cost-effective services in the region, with subsidies per passenger of $27.94, $21.22, and $17.25, respectively.

Figure 4-6: Subsidy per Passenger by Service Type, 2014-2018

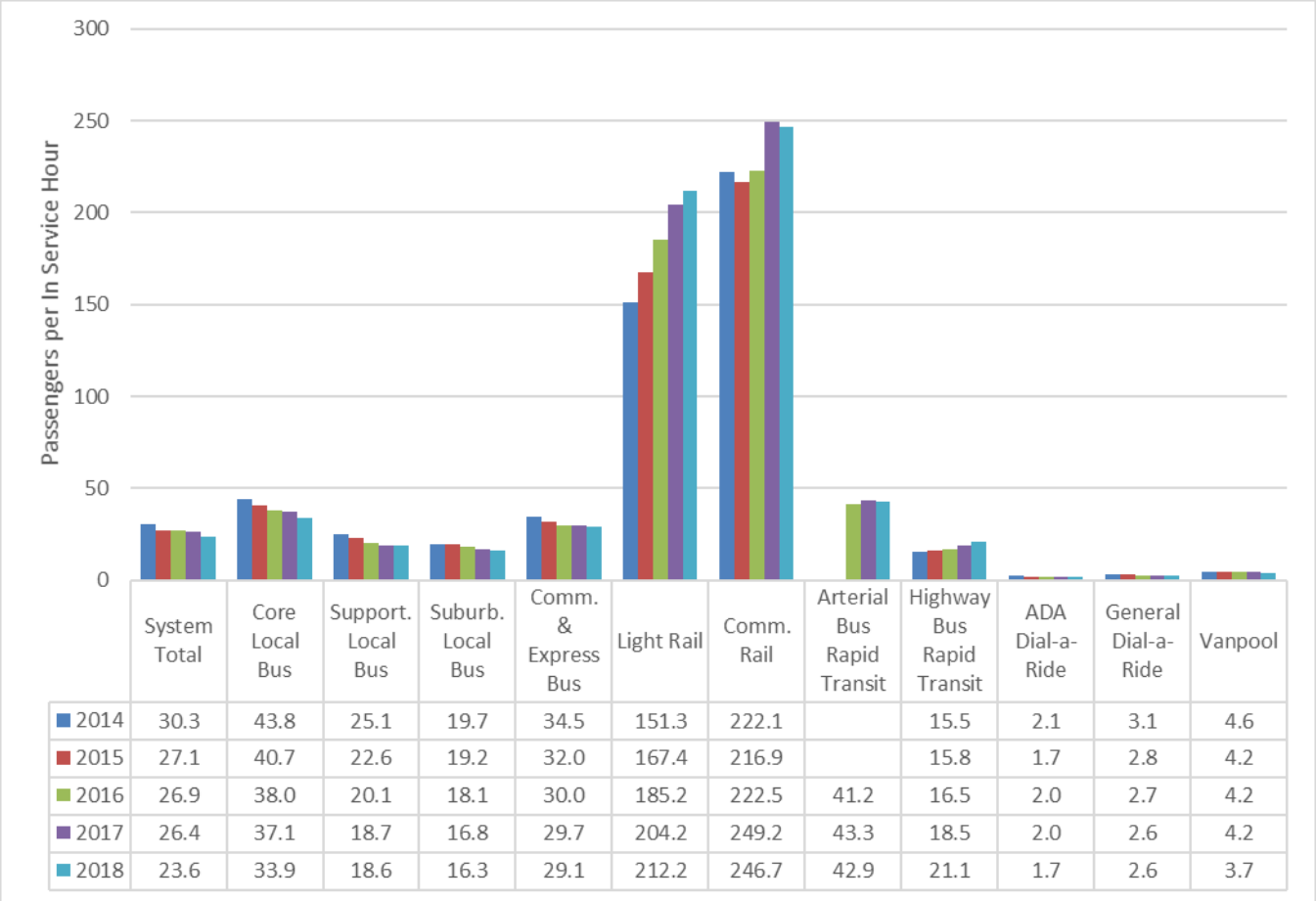


	System Total	Core Local Bus	Support. Local Bus	Suburb. Local Bus	Comm. & Express Bus	Light Rail	Comm. Rail	Arterial Bus Rapid Transit	Highway Bus Rapid Transit	ADA Dial-a-Ride	General Dial-a-Ride	Vanpool
2014	$3.70	$2.96	$5.02	$4.86	$3.93	$2.07	$17.75		$11.25	$24.46	$15.79	$3.82
2015	$3.94	$3.37	$5.77	$5.19	$4.25	$1.88	$18.25		$9.92	$23.90	$16.11	$3.55
2016	$4.20	$3.60	$6.37	$5.69	$4.71	$1.87	$20.12	$4.00	$11.88	$23.50	$17.36	$2.04
2017	$4.26	$3.61	$6.52	$6.14	$4.67	$1.97	$16.15	$3.71	$10.45	$25.94	$18.76	$2.26
2018	$4.84	$4.43	$7.41	$6.89	$5.17	$1.86	$17.25	$3.99	$9.12	$27.94	$21.22	$2.30

Passengers per In-Service Hour

Passengers per in-service hour measures the productivity of transit service as a ratio of total passengers carried per hour of service provided. The regional system carried 23.6 passengers per hour of service provided in 2018, down from 30.3 in 2014 (**Figure 4-7**). Commuter rail and light rail are the most productive services in the region, carrying 246.7 and 212.2 passengers per in-service hour, respectively. ADA dial-a-ride and general dial-a-ride are the least productive services, carrying 1.7 and 2.6 passengers per in-service hour, respectively.

Figure 4-7: Passenger per In Service Hour by Service Type, 2014-2018

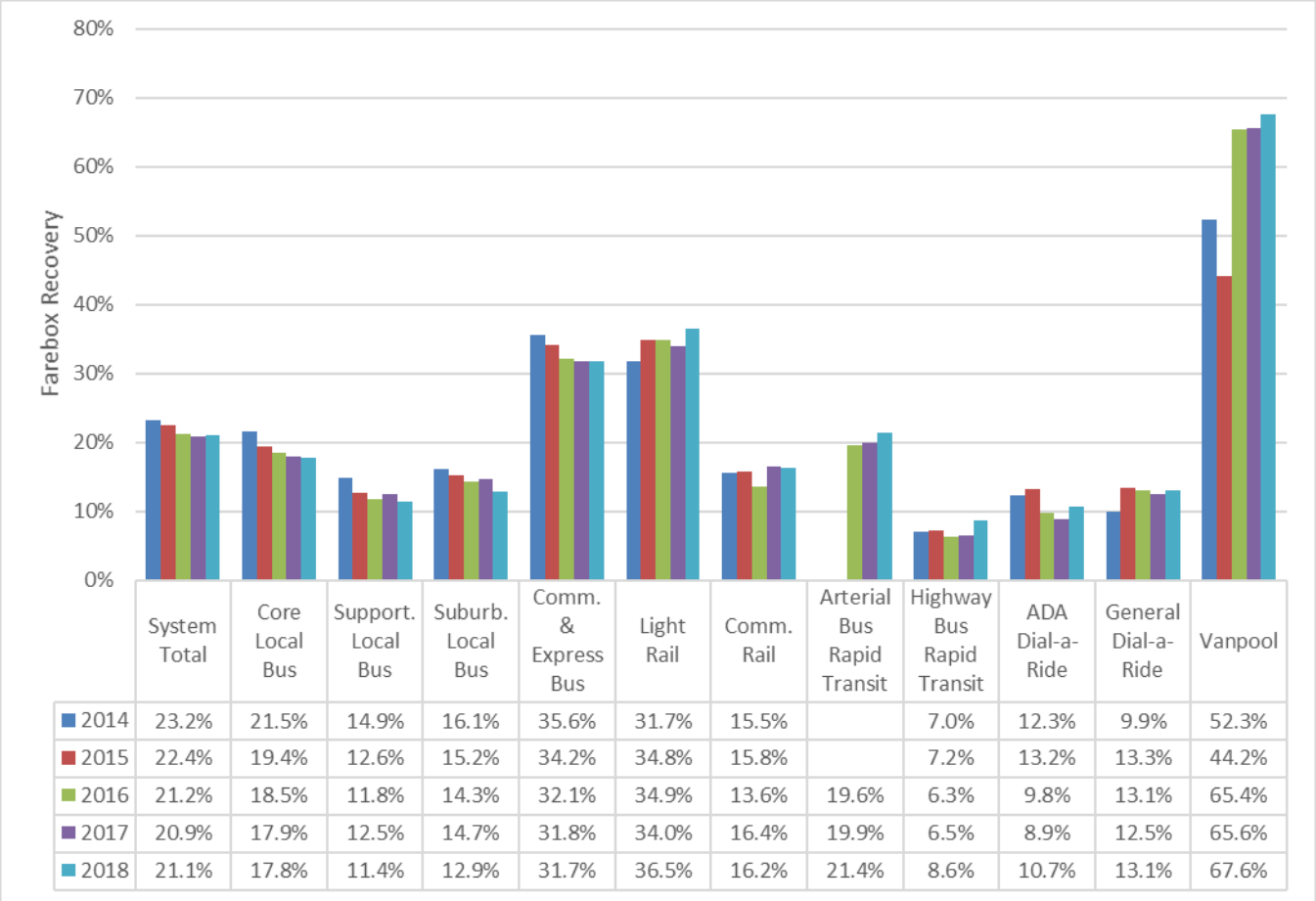


	System Total	Core Local Bus	Support. Local Bus	Suburb. Local Bus	Comm. & Express Bus	Light Rail	Comm. Rail	Arterial Bus Rapid Transit	Highway Bus Rapid Transit	ADA Dial-a-Ride	General Dial-a-Ride	Vanpool
2014	30.3	43.8	25.1	19.7	34.5	151.3	222.1		15.5	2.1	3.1	4.6
2015	27.1	40.7	22.6	19.2	32.0	167.4	216.9		15.8	1.7	2.8	4.2
2016	26.9	38.0	20.1	18.1	30.0	185.2	222.5	41.2	16.5	2.0	2.7	4.2
2017	26.4	37.1	18.7	16.8	29.7	204.2	249.2	43.3	18.5	2.0	2.6	4.2
2018	23.6	33.9	18.6	16.3	29.1	212.2	246.7	42.9	21.1	1.7	2.6	3.7

Fare Recovery

Farebox recovery is the percent of operating costs recovered through fare revenues from passengers. In 2018, the regional farebox recovery was 21.1%, down from 23.2% in 2014 (**Figure 4-8**). Fares were increased in October 2017; the first fare increase in eight years. The full effect of this fare increase will take time to assess, but fare increases typically increase farebox recovery and decrease subsidy per passenger. Vanpool has the highest farebox recovery with 67.6%, but this service is unique in that users operate the vehicles instead of hired operators, eliminating the highest cost incurred in providing traditional service. Light rail and commuter & express bus have the second and third highest farebox recovery with 36.5% and 31.7%, respectively. Highway BRT has the lowest farebox recovery with 8.6%.

Figure 4-8: Farebox Recovery by Service Type, 2014-2018



	System Total	Core Local Bus	Support. Local Bus	Suburb. Local Bus	Comm. & Express Bus	Light Rail	Comm. Rail	Arterial Bus Rapid Transit	Highway Bus Rapid Transit	ADA Dial-a-Ride	General Dial-a-Ride	Vanpool
2014	23.2%	21.5%	14.9%	16.1%	35.6%	31.7%	15.5%		7.0%	12.3%	9.9%	52.3%
2015	22.4%	19.4%	12.6%	15.2%	34.2%	34.8%	15.8%		7.2%	13.2%	13.3%	44.2%
2016	21.2%	18.5%	11.8%	14.3%	32.1%	34.9%	13.6%	19.6%	6.3%	9.8%	13.1%	65.4%
2017	20.9%	17.9%	12.5%	14.7%	31.8%	34.0%	16.4%	19.9%	6.5%	8.9%	12.5%	65.6%
2018	21.1%	17.8%	11.4%	12.9%	31.7%	36.5%	16.2%	21.4%	8.6%	10.7%	13.1%	67.6%

Route Performance and Regional Policy Standards

The Transportation Policy Plan specifies minimum performance measures for both productivity and cost effectiveness for all mode/service types with the exception of ADA dial-a-ride and vanpool. **Table 4-18** and **Table 4-19** shows the number of routes by mode/service type and day of service that either meets or does not meet performance standards for both passengers per in-service hour and subsidy per passenger in 2018.

Table 4-18: Number of Routes Meeting Productivity Standards by Service Type

	Weekday Meets	Weekday Below	Saturday Meets	Saturday Below	Sunday Meets	Sunday Below
Core Local Bus	32	1	21	5	18	6
Supporting Local Bus	12	4	5	7	3	9
Suburban Local Bus	26	18	11	9	10	4
Commuter & Express Bus	85	33	0	6	0	5
Arterial BRT	1	0	1	0	1	0
Highway BRT	0	1	0	1	0	1
Light Rail	2	0	2	0	2	0
Commuter Rail	1	0	1	0	1	0
General Dial-a-Ride	4	0	N/A	N/A	N/A	N/A

Table 4-19: Number of Routes Meeting Subsidy per Passenger Standards by Service Type

	Weekday Meets	Weekday Below	Saturday Meets	Saturday Below	Sunday Meets	Sunday Below
Core Local Bus	26	7	21	5	19	5
Supporting Local Bus	10	6	8	4	8	4
Suburban Local Bus	29	15	15	5	11	3
Commuter & Express Bus	90	28	5	1	3	2
Arterial BRT	1	0	1	0	1	0
Highway BRT	1	0	1	0	1	0
Light Rail	1	1	2	0	2	0
Commuter Rail	1	0	1	0	1	0
General Dial-a-Ride	3	1	N/A	N/A	N/A	N/A

Infrastructure

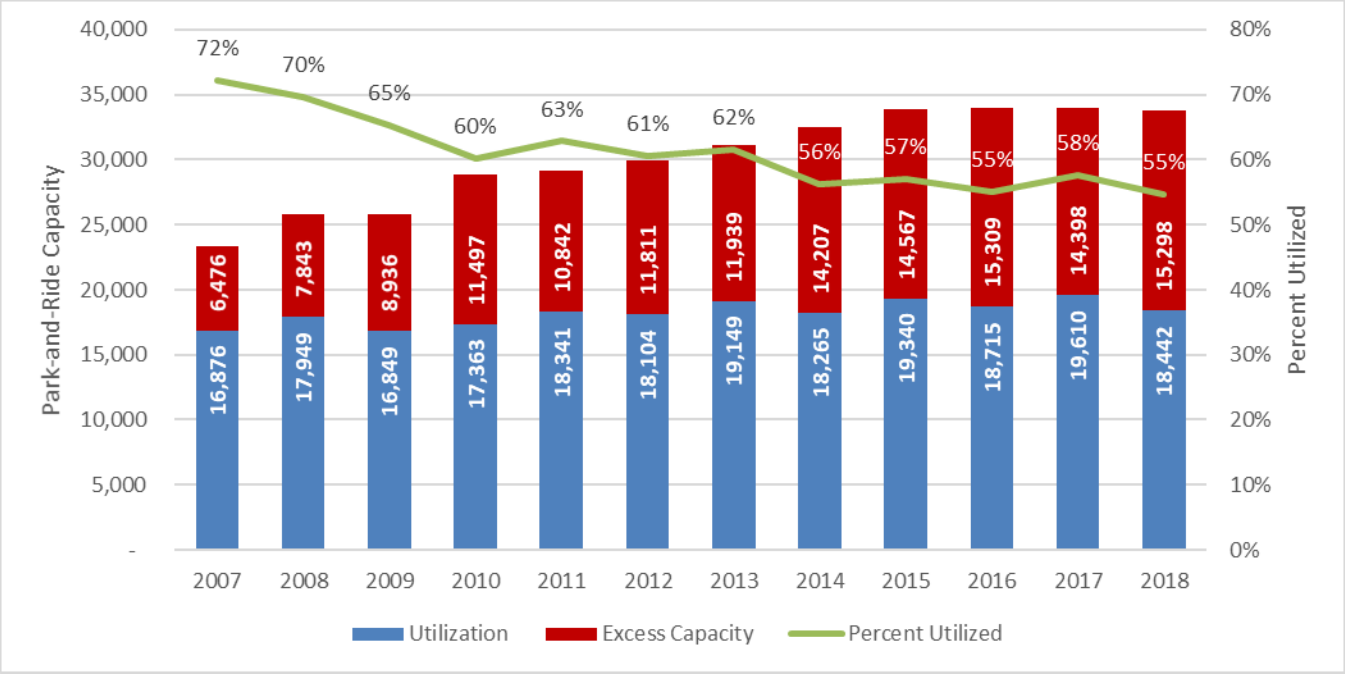
Peak Vehicles Operated

The core of any transit system is its vehicles. In 2018, the maximum number of vehicles used on any given day in the Twin Cities was 1,345. 63% these vehicles were operated by Metro Transit bus and rail, with the remaining vehicles operated by the other programs and providers. Although light rail carried approximately 26% of all regional ridership in 2018, it only used approximately 6% of the total vehicles operated. Comparatively, although dial-a-ride (both ADA and general) only carried approximately 3% of all regional ridership in 2017, it used approximately 31% of the total vehicles operated.

Park-and-Rides

The capacity of the Twin Cities regional park-and-ride system is 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 had 104 active park-and-ride facilities as of 2018, with a total capacity of 33,740. This is up from a capacity of 23,352 spaces in 2007, an approximately 44% increase (**Figure 4-9**). In 2017, the capacity was about 55% utilized on an average weekday. This capacity is available for seasonal peaks and was built to serve the park-and-ride demand in the future, based on 2030 projections.

Figure 4-9: Regional Average Weekday Park-and-Ride Utilization and Capacity, 2007-2018

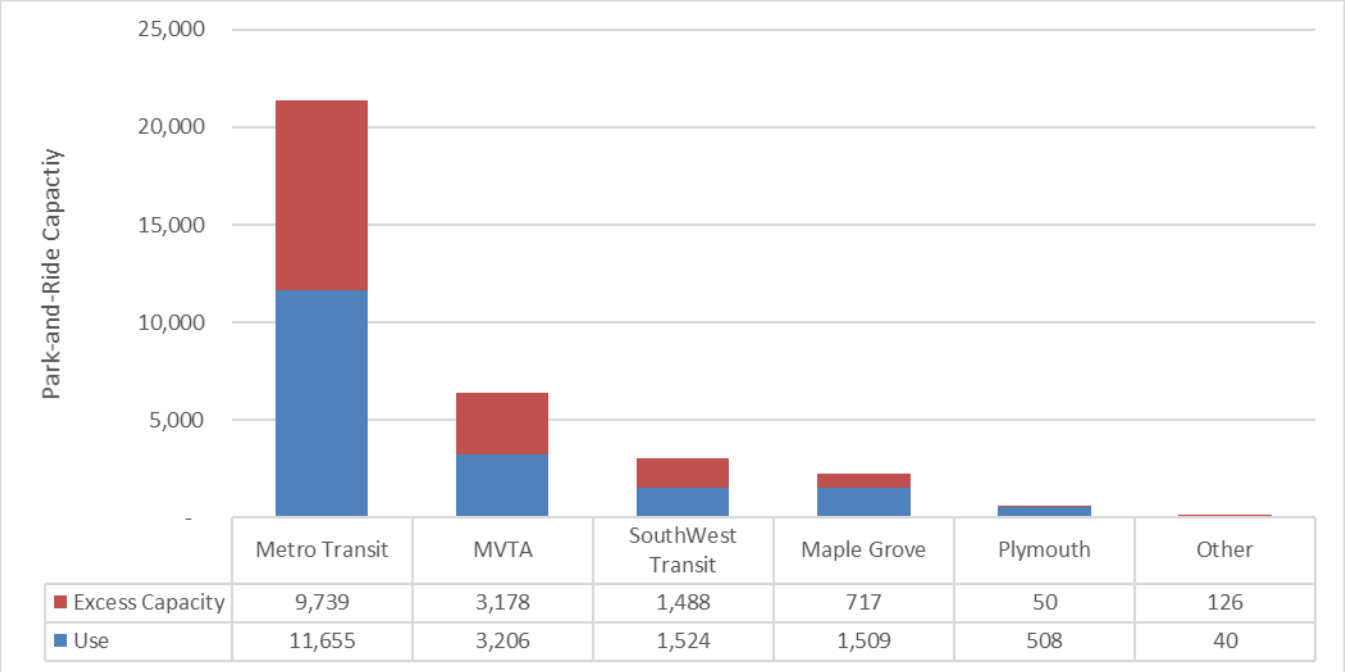


Spaces are provided through three types of arrangement:

- Park-and-rides are owned by transit agencies like Metro Transit or suburban transit providers;
- Park-and-rides are owned by the Minnesota Department of Transportation (MnDOT), typically on excess right-of-way and used under agreement between MnDOT and the transit provider;
- Park-and-rides are joint use with private entities like theatres, shopping centers, or churches.

Park-and-rides are served by Metro Transit and the region's suburban transit agencies (**Figure 4-10**). Metro Transit and the Metropolitan Council accounted for approximately 63% of the region's park-and-ride spaces in 2018. MVTA, the suburban provider with the most park-and-ride spaces, accounted for approximately 19% of all spaces in 2018.

Figure 4-10: Average Weekday Park-and-Ride Utilization and Capacity by Service Provider, 2018



	Metro Transit	MVTA	SouthWest Transit	Maple Grove	Plymouth	Other
Excess Capacity	9,739	3,178	1,488	717	50	126
Use	11,655	3,206	1,524	1,509	508	40

Every other year, the region surveys park-and-ride facilities to determine the home location of Minnesota users. The Metropolitan Council has not been able to determine the home location of Wisconsin users since 2014. The most recent survey was conducted in Fall 2018. Park-and-ride users come from throughout the region including 10% from outside the Transit Capital Levy Communities (communities within the transit taxing district and communities that have come to an agreement with the Metropolitan Council to levy in their community for transit capital) and even beyond the seven-county metropolitan boundary (**Table 4-20**)

Table 4-20: Home Origin of Park-and-Ride Users, 2018

User Home Origins	Count	% of Total
Inside Transit Capital Levy Communities	13,754	79.2%
Outside Transit Capital Levy Communities	1,749	10.0%
Outside of the 7-County Metropolitan Area	1,873	10.8%
Total Park and Ride License Plates	17,376	100.0%
Wisconsin License Plates	332	N/A

Transit Centers and Stations

Transit centers and stations are built to improve waiting conditions and facilitate transfers among buses and trains. Currently there are 26 transit centers throughout the system (**Figure 4-11**), 12 of which are adjacent to a park-and-ride facility. Transit stations are also available for riders along light rail, commuter rail, highway BRT and ABRT lines. There are currently 92 transit stations available to riders throughout the region.

Support Facilities

The Twin Cities transit system relies on numerous support facilities to maintain operations. Metro Transit currently has 13 vehicle and facility-related support facilities, with 16 other facilities servicing Metro Mobility, suburban transit providers, MTS, and other contracted service vehicles. Metro Transit also has a transit control center and other operations related facilities. All facilities, except the Northstar facilities in Big Lake, are located in the seven-county metropolitan area. Several facilities are shared between providers and services.

Transit Advantages

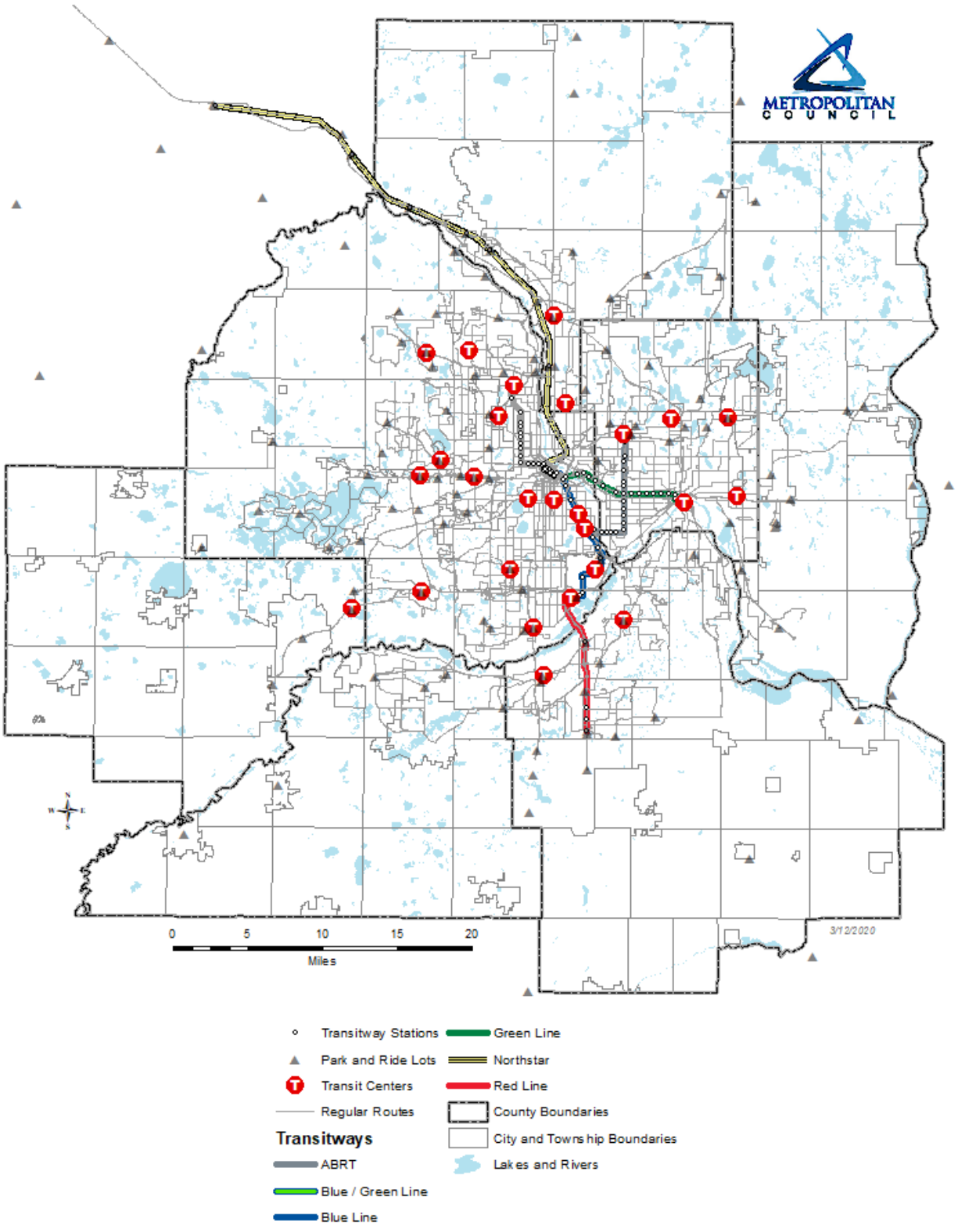
Transit can make use of infrastructure in the transportation system that provide it with a travel time and reliability advantage over other forms of traffic.

State law allows shoulders on highways to be used by buses to bypass congestion and to improve travel times over private automobiles. Most bus shoulders are 10 to 12 feet wide, wider than the typical shoulder designed for automobile breakdowns and emergency vehicles. Shoulders designed to accommodate bus traffic are signed as being for bus use only. The Twin Cities' first bus only shoulder was constructed in 1992. Since then, there has been a dramatic growth in the number of bus-only shoulders in the region. (**Table 4-21**). The spread of bus-only shoulders has been and continues to be restricted by funding and the reduction in availability of potential bus-only shoulder sites.

Table 4-21: Transit Advantages in the Twin Cities

Transit Advantage	Amount
Bus Only Shoulders	336 Miles
Bus Only Lanes on City Streets	6 Miles
Highway Ramp Meter Bypasses	98 Bypasses
Managed Lanes	71 Miles
Exclusive Busways	7 Miles

Figure 4-11: Regional Transit Centers, Transitways and Park and Rides



Transitways

The 2040 Transportation Policy Plan (TPP) includes a proposed network of planned transitways. Investments in transitways are investments in high-demand corridors that allow for fast, reliable travel between regional destinations. The Twin Cities region has already constructed several transitways and continues its progress in building out the network. The METRO Blue Line opened in 2004 and was the first light rail line in the region. In 2009, the Northstar commuter rail line opened providing service from downtown Minneapolis to the Northwest Metro. The METRO Red Line, the region's first bus rapid transit line, and the METRO Green Line, the region's second light rail line opened in 2013 and 2014, respectively. The region's first arterial bus rapid transit line, METRO A Line opened in 2016 and the second ABRT line, METRO C Line opened in 2019.

There are numerous planned transitways that are in various stages of development including METRO D Line, METRO Orange Line, METRO Green Line Extension, METRO Blue Line Extension, METRO Gold Line, the Rush Line, and Riverview streetcar.

Table 4-22: Status of Transitways in the Transportation Policy Plan's Current Revenue Scenario

Transitway	Status	Opening	Mileage	Stations Served
METRO Blue Line	Complete	2004	12	19
Northstar Commuter Rail	Complete	2009	40	7
METRO Red Line	Complete	2013	11	6
METRO Green Line	Complete	2014	11	23
METRO A Line	Complete	2016	10	20
METRO C Line	Complete	2019	8	19
METRO Orange Line	Under Construction	2021	17	11
METRO Blue Line Extension	Engineering	2024	13	12
METRO Green Line Extension	Under Construction	2023	15	17
METRO Gold Line	Project Development	2024	10	21
Rush Line BRT	Environmental Analysis	2026	14	21
METRO D Line	Engineering	2022	18	40
Riverview Streetcar	Environmental Analysis	2031	12	20

Peer Transit Systems

The Twin Cities' transit system performance is assessed, in part, using data from the federal National Transit Database (NTD). The region's performance is compared to the performance of a peer group of 12 urban area transit systems. A map of peer regions is shown in **Figure 2-3** in this report.

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 subsequent 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 peer regions operate regular bus service, and dial-a-ride service. All peer regions, with the exception of Milwaukee, also operate light rail service. The other modes, operated as of the end of 2018, are shown in **Table 4-23**.

Table 4-23: Transit Modes Operated in Each Peer Region

Region	Bus	BRT	Heavy Rail	Comm. Rail	Light Rail	Streetcar	Hybrid Rail	Dial-a-Ride	Vanpool	Other
Baltimore	◆		◆	◆	◆			◆		
Cleveland	◆	◆	◆		◆			◆	◆	
Dallas	◆			◆	◆	◆	◆	◆	◆	
Denver	◆			◆	◆			◆	◆	
Houston	◆				◆			◆	◆	
Milwaukee	◆					◆[3]		◆		
Phoenix	◆				◆			◆		
Pittsburgh	◆				◆			◆	◆	Inclined Plane
Portland	◆				◆	◆	◆	◆	◆	Aerial Tramway
San Diego	◆			◆	◆		◆	◆	◆	
Seattle	◆	◆		◆	◆	◆		◆	◆	Trolley Bus, Monorail
St. Louis	◆				◆			◆	◆	
Twin Cities	◆	◆		◆	◆			◆	◆	

[3] Milwaukee Streetcar, or The Hop, began operations in November 2018 and thus is not included in subsequent analyses.

Peer Statistics

Population

When looking at the performance of peer region transit systems, it is important to consider both population size and population density. These regional characteristics have a large impact on transit demand and, subsequently, a large impact on transit performance within each region.

The two largest regions included in the group of peers analyzed are Dallas, TX and Houston, TX.; however, the peer regions with the highest population densities are San Diego, CA and Denver, CO. Population density levels are correlated with the suitability of different transit modes. More intensive transit modes, such as rail modes, are more suitable when population densities are higher.

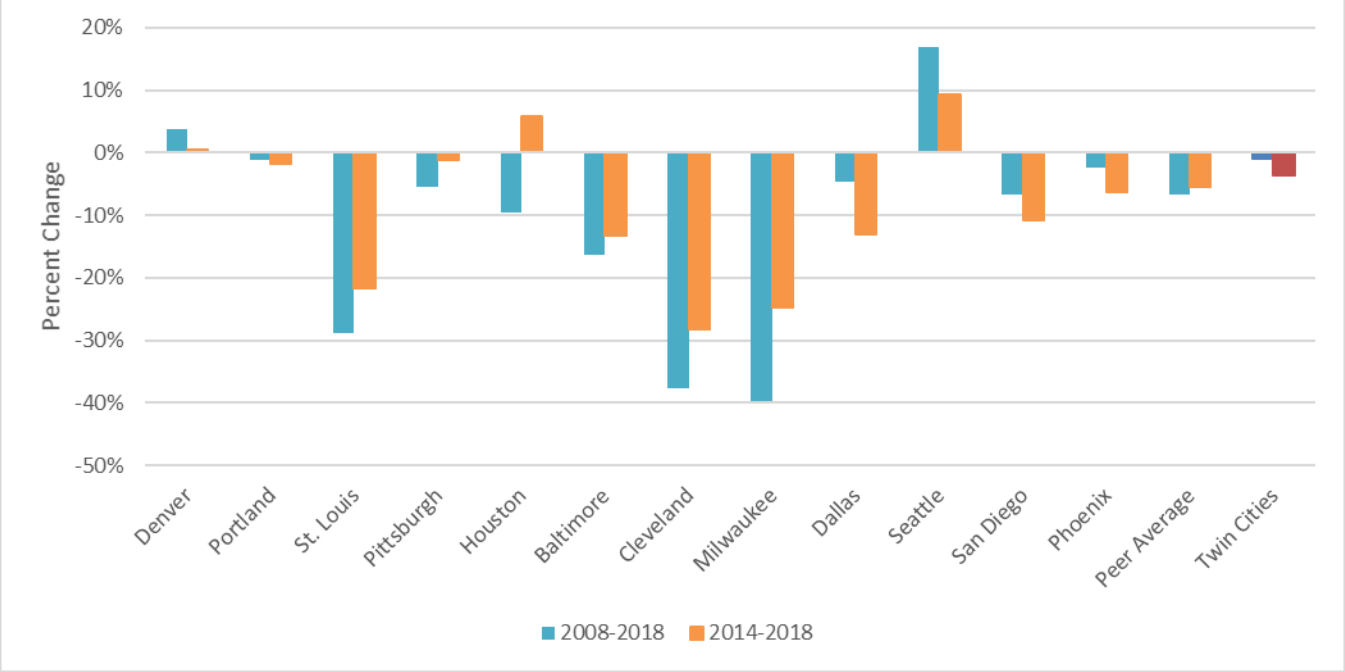
Table 4-24: Peer Region Urbanized Area Population, Areas and Population Densities

Region	Population (2017 UZA)	Land Area (Sq. Mi)	Population Density (Pop/Sq. Mi)	Density Rank
Baltimore	2,275,937	742	3,067.3	8th
Cleveland	1,765,779	778	2,269.6	12th
Dallas	5,618,620	1,815	3,095.7	6th
Denver	2,605,031	682	3,819.7	2nd
Houston	5,507,172	1,694	3,251.0	5th
Milwaukee	1,390,634	565	2,461.3	10th
Phoenix	3,929,596	1,151	3,414.1	4th
Pittsburgh	1,737,262	921	1,886.3	13th
Portland	1,989,163	538	3,697.3	3rd
San Diego	3,136,669	761	4,121.8	1st
Seattle	3,333,028	1,077	3,094.7	7th
St. Louis	2,161,737	935	2,312.0	11th
Twin Cities	2,796,036	1,111	2,516.7	9th

Ridership

With the exception of Seattle and Denver, transit ridership has declined in all peer regions since 2008. The prevalence of ridership decline is in line with overall trends of ridership decline in transit throughout the country. Transit ridership in the Twin Cities has a declined a slower rate than the peer average with ridership declining 0.9% since 2008 and 3.7% since 2014, compared to the peer average of a 6.7% decline 2008 and a 5.4% decline since 2014. Each exception to this decline can be explained by regions investing heavily into transit or reconfiguring outdated networks. Both Seattle and Denver have made broad and significant investments into their transit networks in the past ten years while Houston underwent a significant restructuring of their bus network in addition to expanding their light rail network.

Figure 4-12: Ridership Change in Peer Regions, 2008-2018, 2014-2018

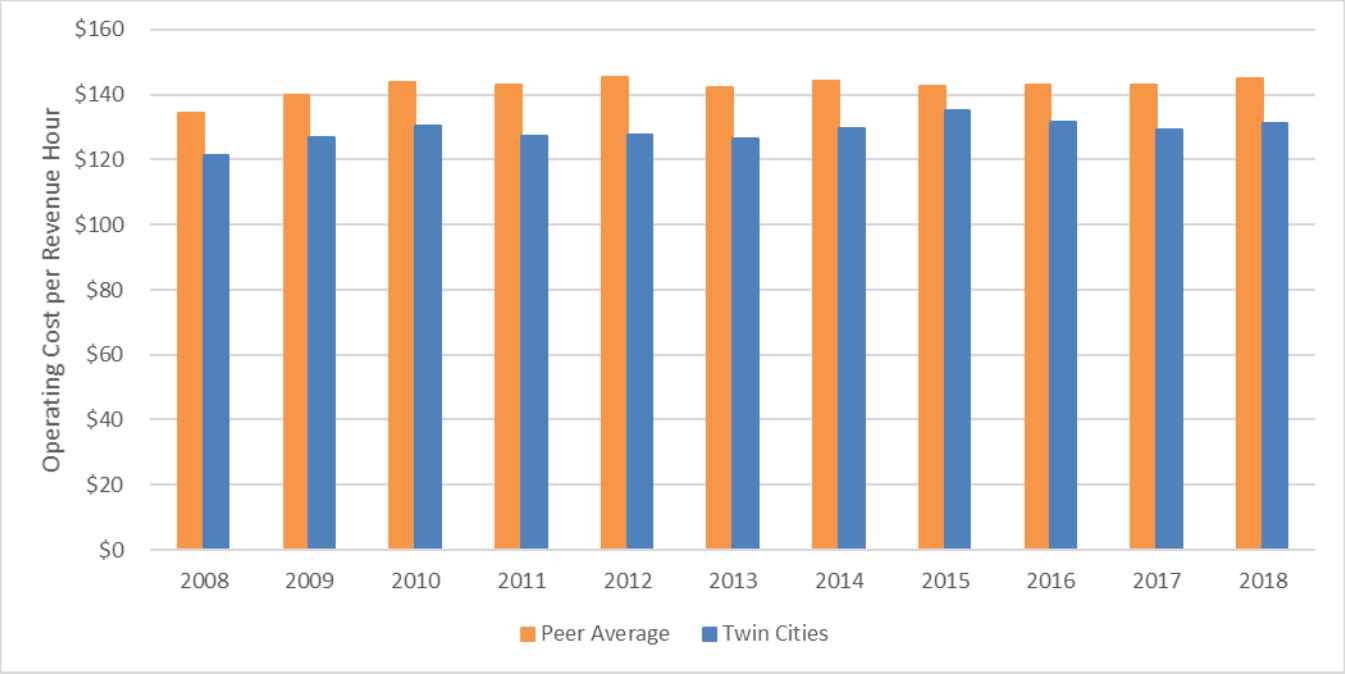


Expenses

Transit in the Twin Cities has a lower operating cost per hour than the peer region average, transit in the Twin Cities region cost on average $131.08 per revenue hour to provide compared to the peer average $144.87 per revenue hour. Increases in operating expenses per revenue hour in the Twin Cities have been in line with those found in peer regions. When accounting for inflation, costs per revenue hour have increased in the Twin Cities by 8.1% since 2008 and by 1.0% since 2014, peer average operating costs per hour have increased by 7.8% since 2008 and 0.5% since 2014.

Figure 4-13: Operating Cost per Revenue Hour, Nominal Value

Figure 4-14: Operating Cost per Revenue Hour, Adjusted for Inflation, 2018 Dollars

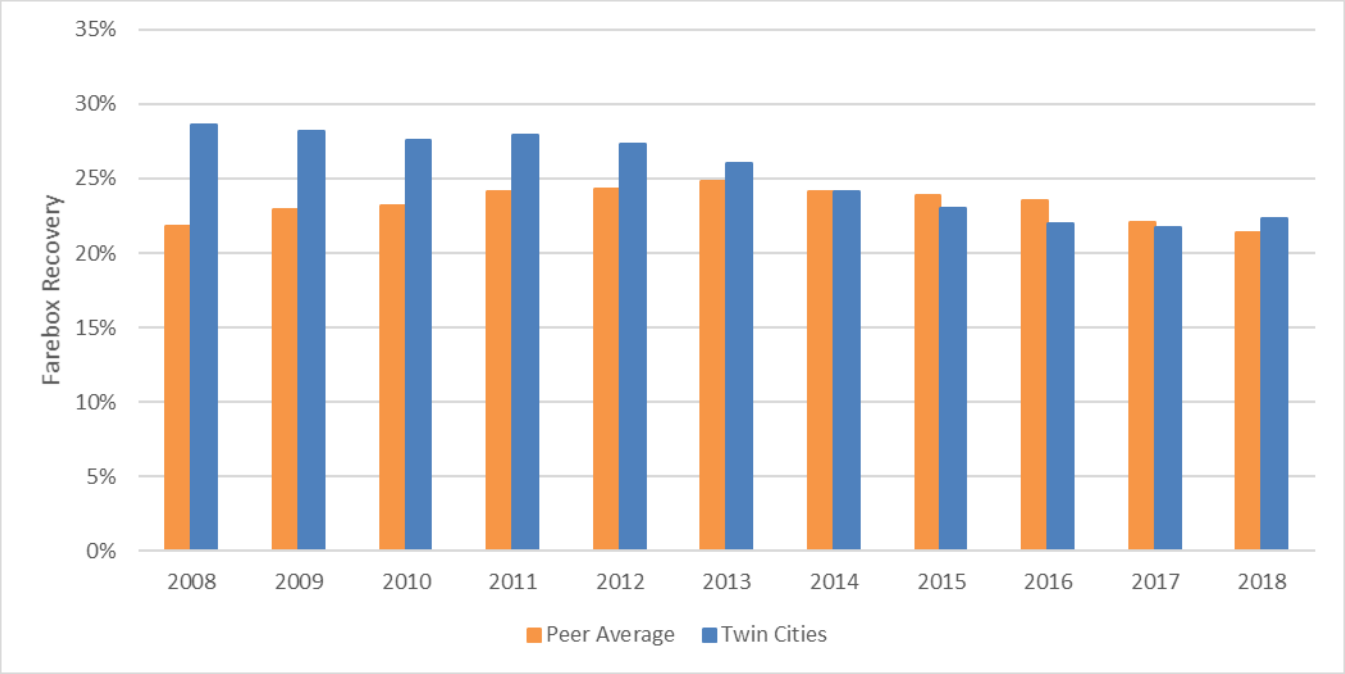


Performance Measures

Farebox Recovery

Farebox recovery is the percentage of operating costs covered by passenger fares. **Figure 4-15** shows the Twin Cities region's farebox recovery is slightly higher than the peer group average. Fares paid by the region's transit riders cover 22.3 percent of transit operating costs compared to 21.4 percent for peer regions. There has been a general trend in a slight decrease in farebox recovery ratios in the past five years, though farebox recovery has been declining at a slower rate than the peer average; farebox recovery declined by 7.5% since 2014 in the region compared to an average decline of 11.2% amongst peer regions. Declining farebox recovery in the Twin Cities since 2014 is influenced by two major trends: bus operating costs have been increasing while bus revenues have been declining and Metro Mobility costs have been increasing significantly faster than revenues have. Since 2014 bus operating costs increased by 12% while revenue have shrunk 7%, and in the same time period Metro Mobility costs have increased 35% while revenues increased at only have the rate at 17%. The introduction of the Green Line was met with robust ridership but also introduced costs at a rate that contributed to the overall trend of decreased farebox recovery in the region.

Figure 4-15: Farebox Recovery, Twin Cities and Peer Region, 2008-2018



Subsidy per Passenger

Subsidy per passenger is the cost made up by government subsidies after user revenues (fares) 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 subsidy per passenger trip in 2018 in the Twin Cities was $4.56, slightly lower than the peer average of $4.83. With national trends of decreased ridership and increased operating costs seen among peers, subsidies per passenger trip have trended upwards. In the past 10 years subsidies per passenger trip in the Twin Cities have increased at a faster rate than the peer average. When accounting for inflation, as seen in **Figure 4-17**, subsidies per passenger in the Twin Cities have increased 49.6% since 2008, while the peer average subsidy per passenger has increased 30.2%. Increases in subsidies per passenger in the Twin Cities for the past five years have been more in line with average increases in peer subsidies per passenger; subsidies per passenger have increased by 18.1% between 2014 and 2018, and have increased by 21.7% in the same time period on average for peer regions.

Figure 4-16: Subsidy per Passenger, Twin Cities and Peers, 2008-2018, Not Adjusted for Inflation

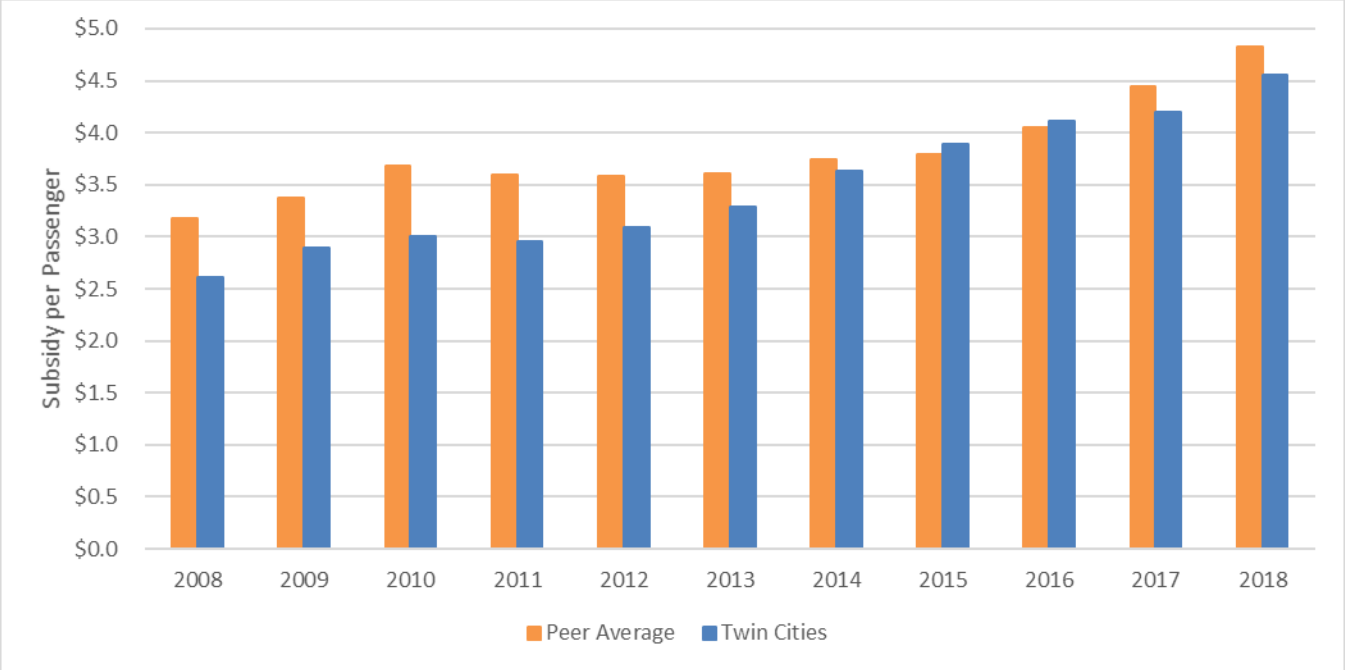
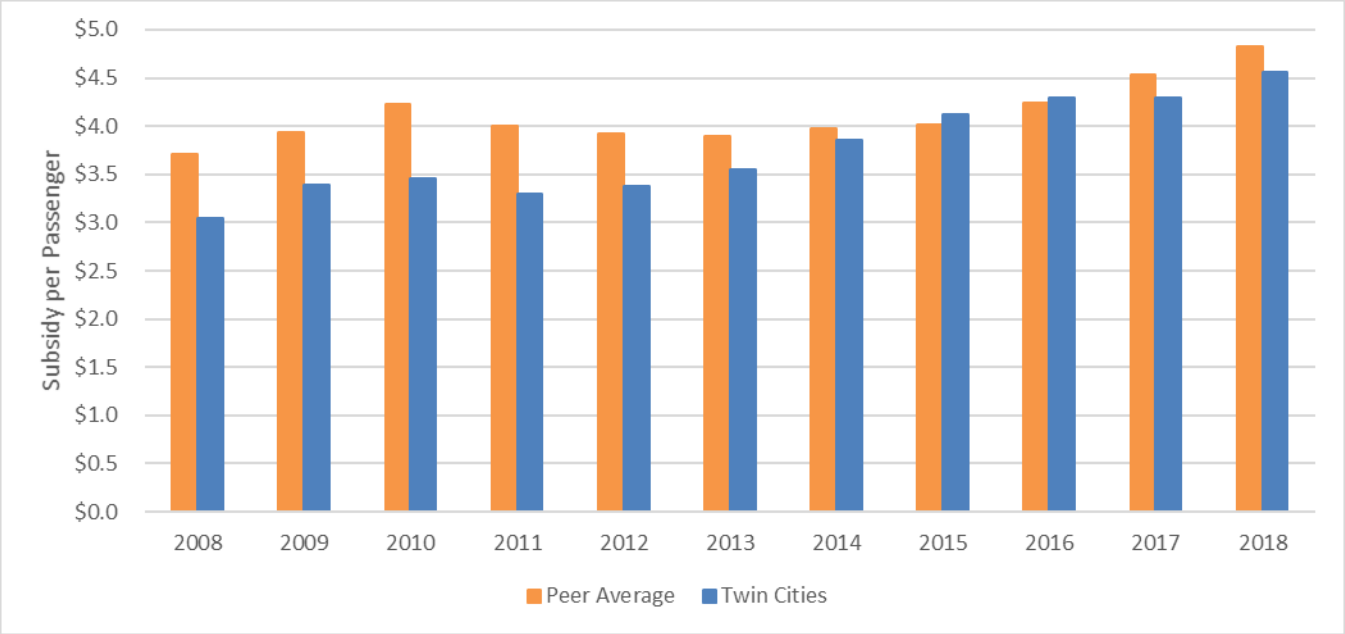


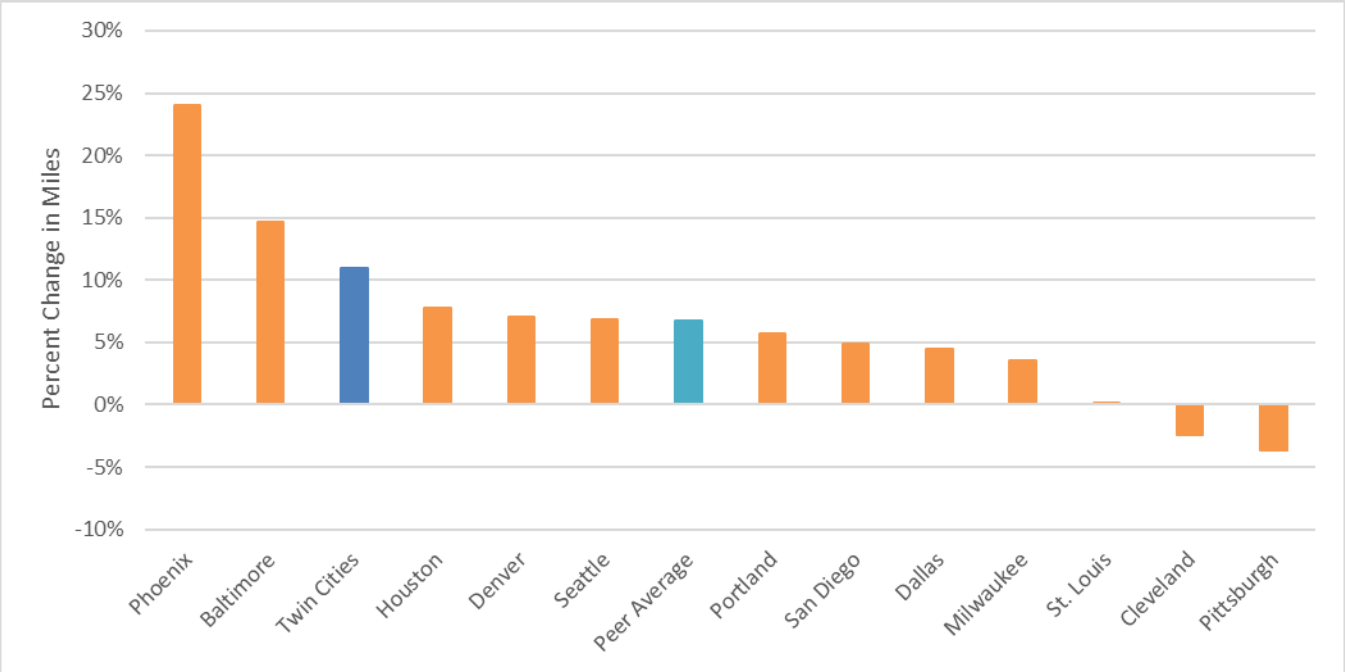
Figure 4-17: Subsidy per Passenger, Twin Cities and Peer Regions, Adjusted for Inflation, 2018 Dollars



Miles of Service

The number of miles of transit service provided in the Twin Cities is above the peer region average. The Twin Cities region has 21.3 miles of transit service per capita compared to the peer average of 17.5 miles. Growth in transit service in the past five years in the Twin Cities is high compared to its peers, between 2014 and 2018, transit miles per capita in the Twin Cities grew by 11.0%, compared to the peer average of 6.8% in the same time period. This growth in transit miles provided per capita is due in part to the growth of Metro Mobility service in the region.

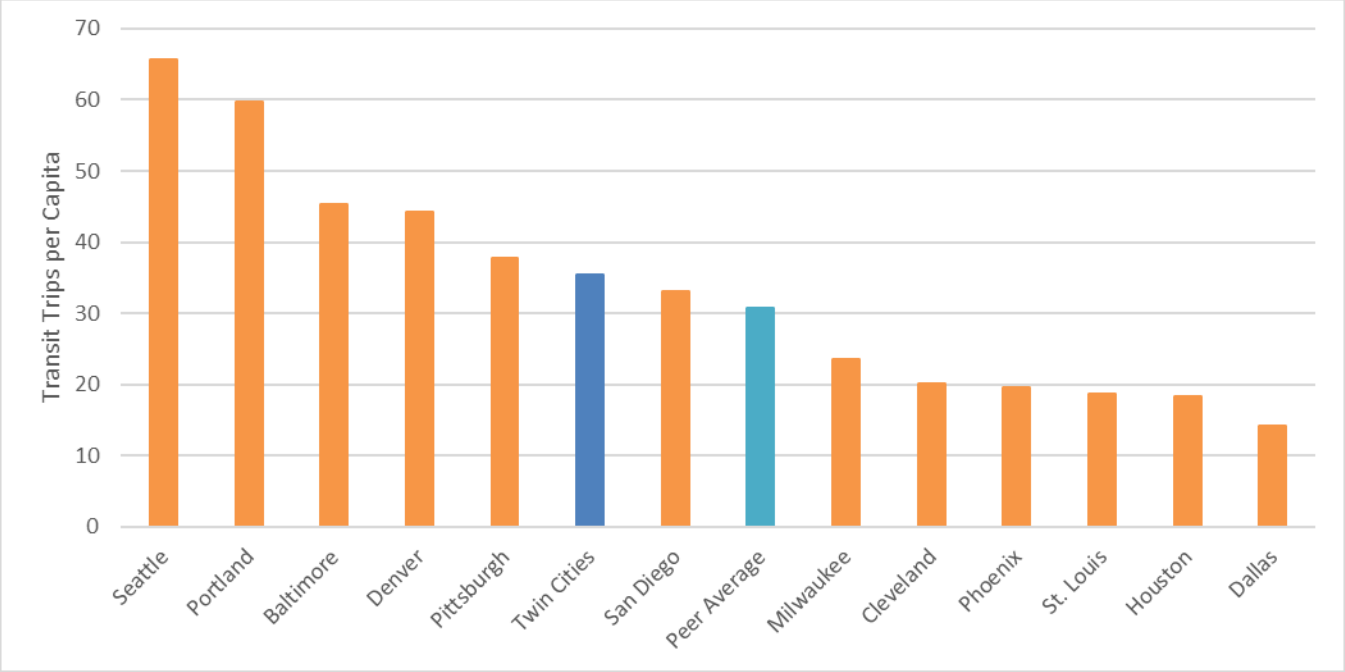
Figure 4-18: Change in Miles of Transit Service per Capita, 2014-2018



Transit Rides per Capita

Amongst its peers the Twin Cities had a slightly higher of transit trips per capita than its peers, with 35.5 trips per capita in 2018, compared to the peer average of 30.8 trips per capita. Though higher than average, the Twin Cities still has a significantly lower number of trips per capita than peer regions that have more intensive investments in to the their transit networks such as Seattle (65.7 trips per capita), Portland (59.7 trips per capita), Baltimore (45.4 trips per capita) and Denver (44.2 trips per capita).

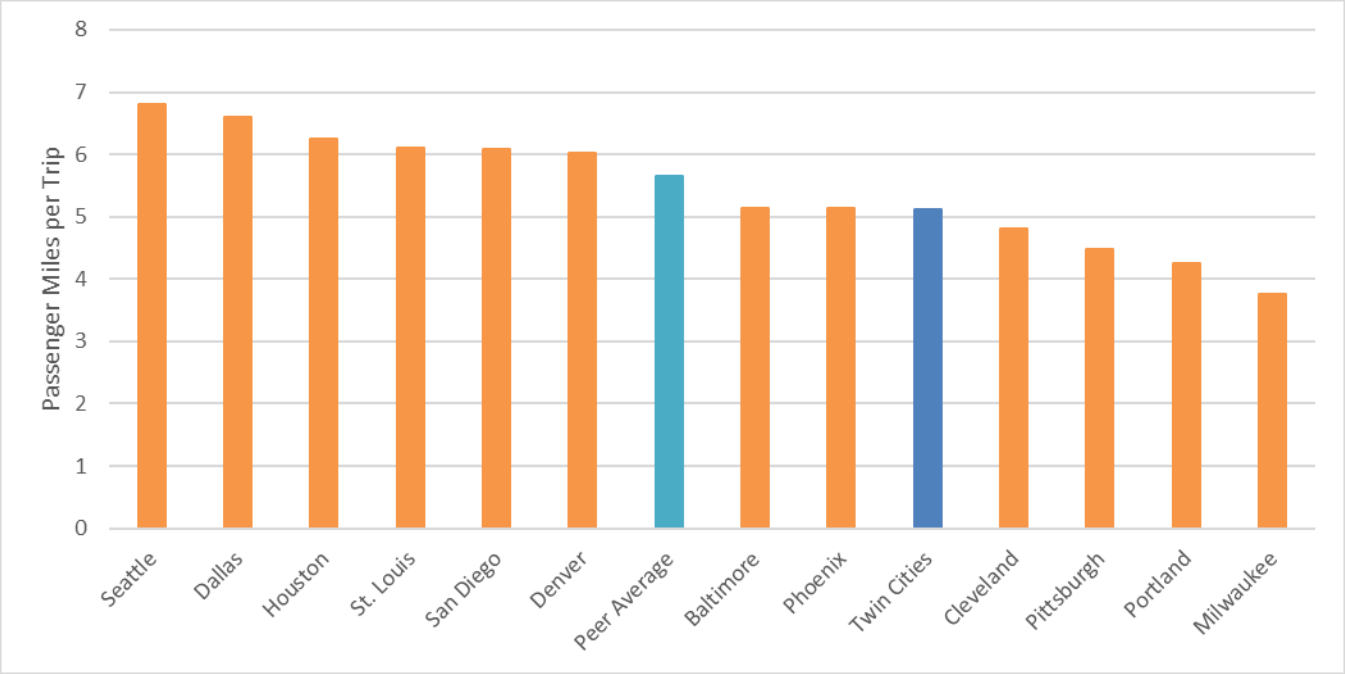
Figure 4-19: Transit Trips per Capita, 2018



Passenger Miles per Trips

Trends found when analyzing passenger miles per trip reflect multiple characteristics of a transit system in a given region including the geographic size of the area transit serves, the types of trips transit is used for and the prevalence of particular transit service types (i.e. the share of longer distance commuter service vs the shorter distance local service). The passenger miles per trip found in regional peers range from a high of 6.8 miles per trip in Seattle to 3.8 miles per trip in Milwaukee. Trips in the Twin Cities is shorter than the average peer trip when measured in passenger miles. The average trip in the Twin Cities is 5.1 miles, compared to the average of 5.7 miles. Higher passenger miles per trip in Dallas and Houston may be a consequence of the large size of their geographic areas. Seattle, which has a smaller geographic size than the Twin Cities region, has higher passenger miles per trip due to a greater prevalence of trips on commuter routes, which are generally longer distance.

Figure 4-20: Passenger Miles per Trip



Successes and Opportunities

Transit serves a variety of roles in the Twin Cities region; some of those roles are reflected in the goals and objectives found in the Metropolitan Council's *Transportation Policy Plan* (relevant goals and objectives can be found in Chapter 1 of this document). The following highlights some of the successes and opportunities that the regional transit system has had in making progress on the TPP's transit goals and objectives, such as attracting and retaining residents and businesses, supporting development near multimodal options, reducing greenhouse gas emissions, and providing new and attractive transit options to Twin Cities travelers.

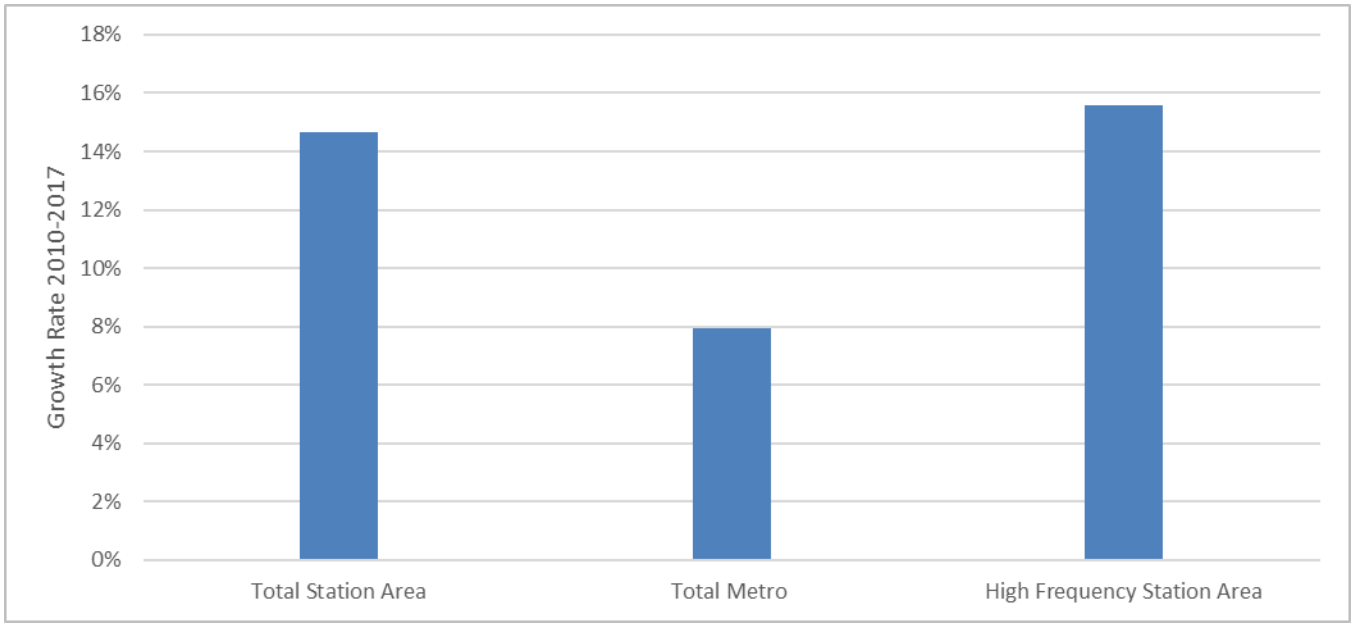
Investing in Transit to Attract and Maintain Residents and Businesses

The impacts of investing in transit are not limited to improving mobility, transit investments also have impacts on development and land use decisions made in the region. Over 15,000 multifamily residential units were permitted within 1/2 mile of transitway stations between 2009 and 2017. This represents 30% of regional multifamily developments on just 2% of the region's land. Transitway station areas also saw $3.7 billion in commercial development between 2003 and 2017, representing 33% of commercial development on just 2% of the region's land. Transitway station areas also saw public and institutional development of $850 million between 2003 and 2017, representing 16% of regional public development on just 2% of the region's land. In addition to permitted units, there are also 15,000 additional planned multifamily units along transitways, representing $5 billion in development value.

Planned transitways are also attracting development. As of February 2018, developers have proposed, completed or started more than $1 billion worth of projects along the future Southwest light rail corridor, an increase from $515 million worth of development a year prior.

Along with development, transit investments have also attracted residents. Transitway station areas have seen population growth at almost double the rate of the overall metropolitan area (**Figure 4-21**). Population growth within transitway station areas grew by 15% between 2010 and 2017 while the metropolitan area in general grew by 8%.

Figure 4-21: Station Area and Metro Area Population Growth, 2010-2017

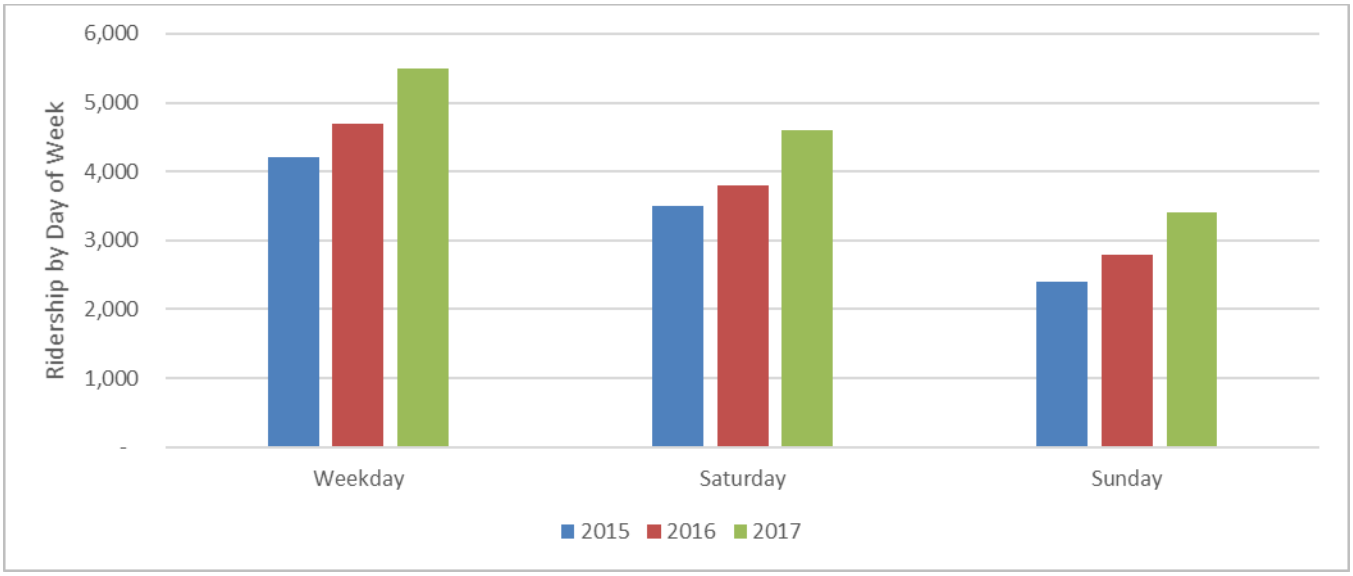


Increasing Transit Attractiveness to Grow Ridership - Success of the A Line and C Line

The A Line was the first arterial bus rapid transit line to open in the Twin Cities region, followed by the C Line several years later. The initial performance of both lines has proven to be a success in providing fast and reliable service that is attractive to travelers.

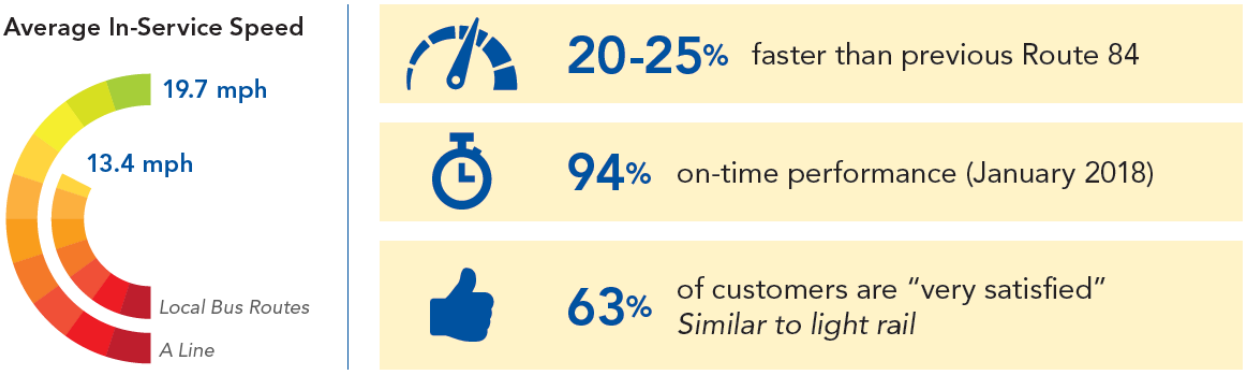
The benefits of improved customer experience, frequency, speed and reliability have led to significant ridership growth along the Snelling and Ford Parkway corridors. At the end of the A Line's first full year of operations, corridor ridership (A Line and Route 84) grew by 32% from 4,200 average weekday trips in 2015 to 5,500 in 2017 (**Figure 4-22**). The A Line alone carried over 1.6 million riders in 2018 and in 2019, the A Line and C Line carried a combined 2.9 million riders with only six months of C Line service.

Figure 4-22: A Line Corridor Ridership by Day of Week, 2015-2017



Riders have also benefitted from the improved speeds and reliability. The A Line is 32% faster than the average local bus route. Its average in-service speed is 19.7 miles per hour compared to 13.4 miles per hour on average for local bus routes. The A Line is also 20 to 25% faster than Route 84, the local route serving the corridor. The A Line has also proven to be a reliable service with 94% of trips on time[4].

Figure 4-23: A Line Performance, 2017



Source: Metro Transit A Line 2017 Snapshot, Metro Transit

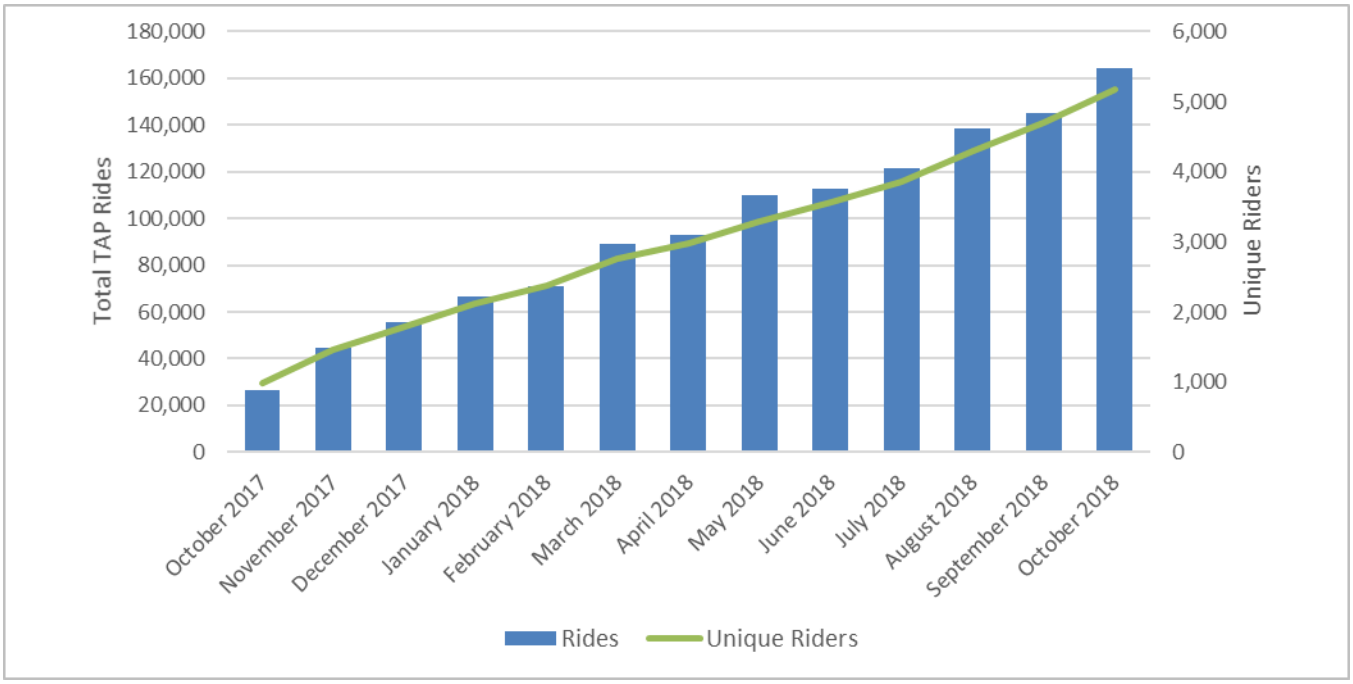
[4] January 2018

Improve the Availability of Transit through Affordability – Transit Assistance Program

The Transit Assistance Program (TAP) is a transit fare card that allows qualified low-income residents to ride for just $1 per ride with a two-and-a-half-hour transfer. Residents are eligible if they hold a certifying document from an approved community partner organization. In 2018, TAP riders saved approximately $1 million in fare payments.

Since the TAP card was introduced in October 2017, the total number of TAP rides, as well as unique TAP riders, increased every month, as of October 2018 (**Figure 4-24**).

Figure 4-24: Monthly TAP Rides and Unique TAP Riders



Maintaining Speed and Reliability for Buses during I-35W Construction Impacts

A major highway construction project on Interstate 35W, a major commuter and express bus corridor, from downtown Minneapolis to Highway 62, has an estimated project timeline of summer 2017 to fall of 2021. Some of the transit improvements included as part of the project include extended MnPASS lanes (high occupancy toll lanes available to buses); a new Lake Street Station as part of the METRO Orange Line highway BRT project; and a new transit ramp at 12th Street allowing a seamless bus connection between bus only lanes on Marquette/2nd Avenues and the I-35W MnPASS lanes.

One of the major impacts of the 2018 construction season was the closure of the highway access ramp to downtown, requiring all express bus routes on the corridor to be detoured to either 1st/Blaisdell Avenues or Park/Portland Avenues in south Minneapolis. Metro Transit invested heavily in reliability to mitigate construction impacts on transit service, including adding additional running and recovery time built into the schedules, additional trips, and extra standby buses. Speed enhancements were also made on Park/Portland Avenues, adding peak direction transit-only lanes and a queue jump at Lake Street. Overall, construction impact mitigation efforts have been positive, especially on routes detoured on Park/Portland Avenues. Additional street capacity and added transit advantages on Park/Portland have led to increased reliability and ridership increases for those routes compared to 1st/Blaisdell Avenues.

Increasing the Availability of Transit through Innovations in Technology – SW Prime

SouthWest Transit's SW Prime service is the first microtransit service in the Twin Cities region. SW Prime has now been operating for over three years and has seen an 800% increase in ridership since it started operation in 2015. SW Prime is now serving over 400 rides a day while using only one dispatcher/reservationist to manage the entire system. SouthWest Transit is currently pursuing an expansion of SW Prime's role in its service network.

In 2019, SouthWest Transit will be launching a non-emergency medical trip service, SW Prime MD, using its microtransit infrastructure. Future SW Prime service plans include service along the I-494 corridor to the Mall of America and the Minneapolis-St. Paul International Airport, as well as increased first-mile and last-mile services with the coming of METRO Green Line Extension. As they continue to expand, SouthWest Transit's ultimate vision for SW Prime is to have a fully autonomous electric fleet meeting both the first-mile and last-mile and local trip needs of SouthWest Transit's communities.

Findings and Conclusions

- Overall regional transit ridership has declined from a recent peak of 98 million trips in 2015 to 93 million trips in 2018.
- Ridership on regional transitway services has increased every year, from 11 million rides in 2013 to 28 million rides in 2018; transitway trips now constitute over 30% of overall transit ridership. Transitway ridership increases are largely due to increased regional investment in transitways including the opening of METRO Green Line in 2014, the opening of METRO A Line in 2016 and the METRO C Line in 2019.
- The majority of transit trips in the region continue to occur on bus services, including BRT services. In 2018, 70% of all transit rides occurred on bus services.
- Investments in the transit system have attracted residents and businesses. Transitway station area populations have grown at almost double the rate of the general metro area. Transitway station areas also attracted a third of commercial development between 2003 to 2017.
- The initial two routes of the arterial bus rapid transit network have met with great success. By 2018, METRO A Line increased ridership in the Snelling Ave corridor by 32% and initial results are similar on the METRO C Line.
- Subsidies required to provide transit service have increased, from $3.70 per ride in 2014 to $4.84 in 2018; rail services and vanpool were the only modes where subsidies decreased between 2013 and 2018.
- Farebox recovery has also decreased overall, from 23% in 2014 to 21% in 2018. The more gradual decrease of farebox recovery may be attributed to fare increases in 2017
- The transit system's productivity has decreased as ridership decreased; productivity dropped from 30.3 passengers per in-service hour to 23.6 passengers per in-service hour in 2018
- Park-and-ride use remained relatively unchanged since 2011, with average park-and-ride use ranging between 18,341 and 19,610. The percentage of park-and-ride spaces being utilized has been stable since 2014, ranging from 55% to 58% of spaces being utilized.
- The decline in transit ridership in the Twin Cities mirrors the national trends of declining transit ridership. Transit ridership in all peer regions, apart from Denver and Seattle, declined between 2008 and 2018
- The Transit Assistance Program has increased the availability of transit by making it more affordable. Residents eligible for the program are able to use transit at a reduced fare of $1.00. In 2018, TAP riders saved approximately $1 million in fare payments.
- Smartphone accessible dial-a-ride service, or microtransit, has found an increasing role in the Twin Cities. By 2019, each suburban transit service provider in the region had implemented a microtransit service. SouthWest Prime, the longest running microtransit service, now provides over 400 rides a day, an 800% increase since its introduction in 2015.

Chapter 5: The Freight System

Characteristics of the Regional Freight System

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.

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 recreate. Many businesses would not be able to distribute their products to customers or receive shipments needed to manufacture items.

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.

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) to freight- generating industries such as manufacturers and processing plants, to last-mile connections for distribution facilities, ports and rail yards, to 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.
- **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.
- **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.

Freight Modal Distribution

Based on data from the 2012 Commodity Flow Surveys (CFS), about 178 million tons of freight valued at approximately $280 billion is moved annually in the Minnesota portion of the Minneapolis-St. Paul Combined Statistical Area (CSA), which includes 19 counties. This includes $95 billion in inbound shipments (68 million tons), $128 billion in outbound shipments (55 million tons), and $57 billion in intraregional shipments (56 million tons) as shown in **Tables 5-1** and **5-2**. This does not include through shipments that do not have an origin or destination within the region.

About 178 million tons of freight valued at approximately $280 billion is moved annually in the Minnesota portion of the Minneapolis-St. Paul Combined Statistical Area (CSA), which includes 19 counties.

In terms of international export trade, the Twin Cities region ranked 21st in the nation in 2018 for total export value at just more than $20 billion according to the International Trade Administration within the U.S. Department of Commerce.

Most of the value and tonnage of the region's freight is transported by truck, as shown in **Figure 5-1**. On average, about 87 percent of freight by value and 68 percent by weight is carried by truck to and from the Twin Cities area. Rail is also a key mode, carrying about 25 percent of the region's freight by weight. Compared to trucking and rail, lower levels of freight activity are accommodated via air or water. These secondary modes, however, are critical to sustain particular industries such as agriculture and aggregate products (waterborne freight) and precision medical instruments (air freight).

On average, about 87 percent of freight by value and 68 percent by weight is carried by truck to and from the Twin Cities CSA area.

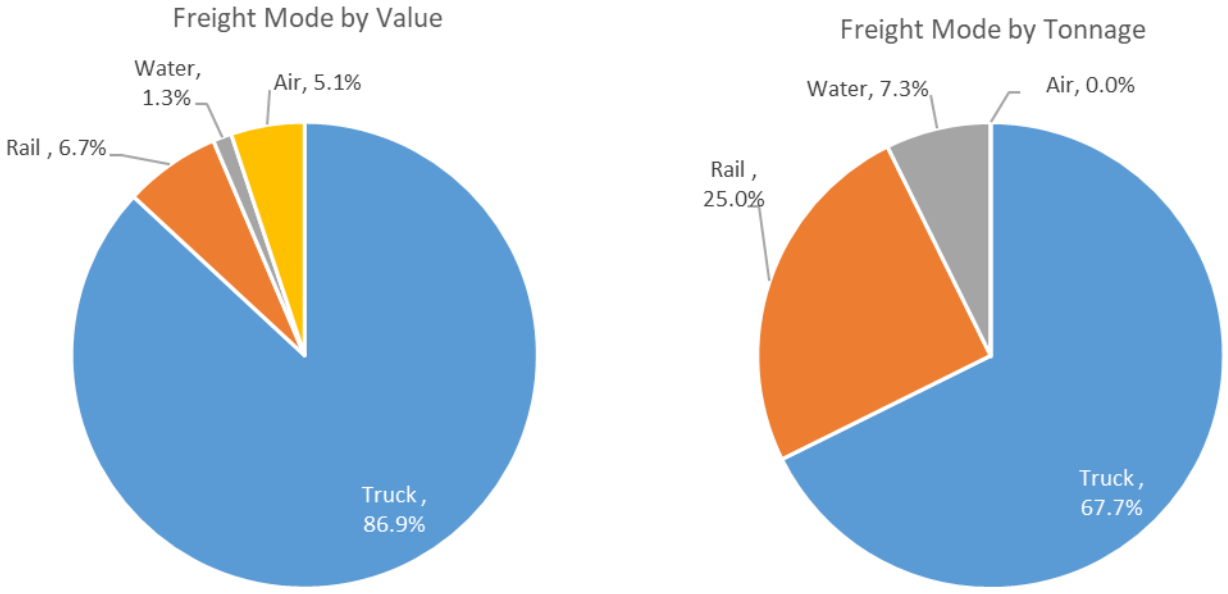
Table 5-1: Regional Freight Shipments by Value (Annual Dollars, in Billions)

Type of Shipment	2007	2012	Percent change
Inbound	$75.44	$95.00	**25.9%**
Outbound	$112.79	$127.95	**13.4%**
Intra-Region	$58.94	$56.82	**-3.6%**
Total	**$247.17**	**$279.77**	**13.2%**

Table 5-2: Regional Freight Shipments by Weight (Annual Tons, in Millions)

Type of Shipment	2007	2012	Percent change
Inbound	47.95	68.15	**42.1%**
Outbound	47.32	54.51	**15.2%**
Intra-Region	72.94	55.68	**-23.7%**
Total	**168.22**	**178.33**	**6.0%**

Figure 5-1: 2012 Regional Freight Modal Split by Value and Tonnage (Estimates Based on Multiple Data Sources)



Highway System

Daily Truck Volumes 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. **Figures 5-2** and **5-3** show estimated 2019 Heavy Commercial Annual Average Daily Traffic (HCAADT) on statewide and regional highways based on Freight Analysis Framework (FAF) network assignment estimates. 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 volumes occur along I-35 between Des Moines, Iowa and Duluth, Minnesota. The I-94/I-90 corridor to Chicago is of particular significance as freight volumes trucked via I-94/I-90 to that city's rail and air freight hubs continues to grow.

Figure 5-2: Statewide Estimated Daily Truck Volumes (2019)

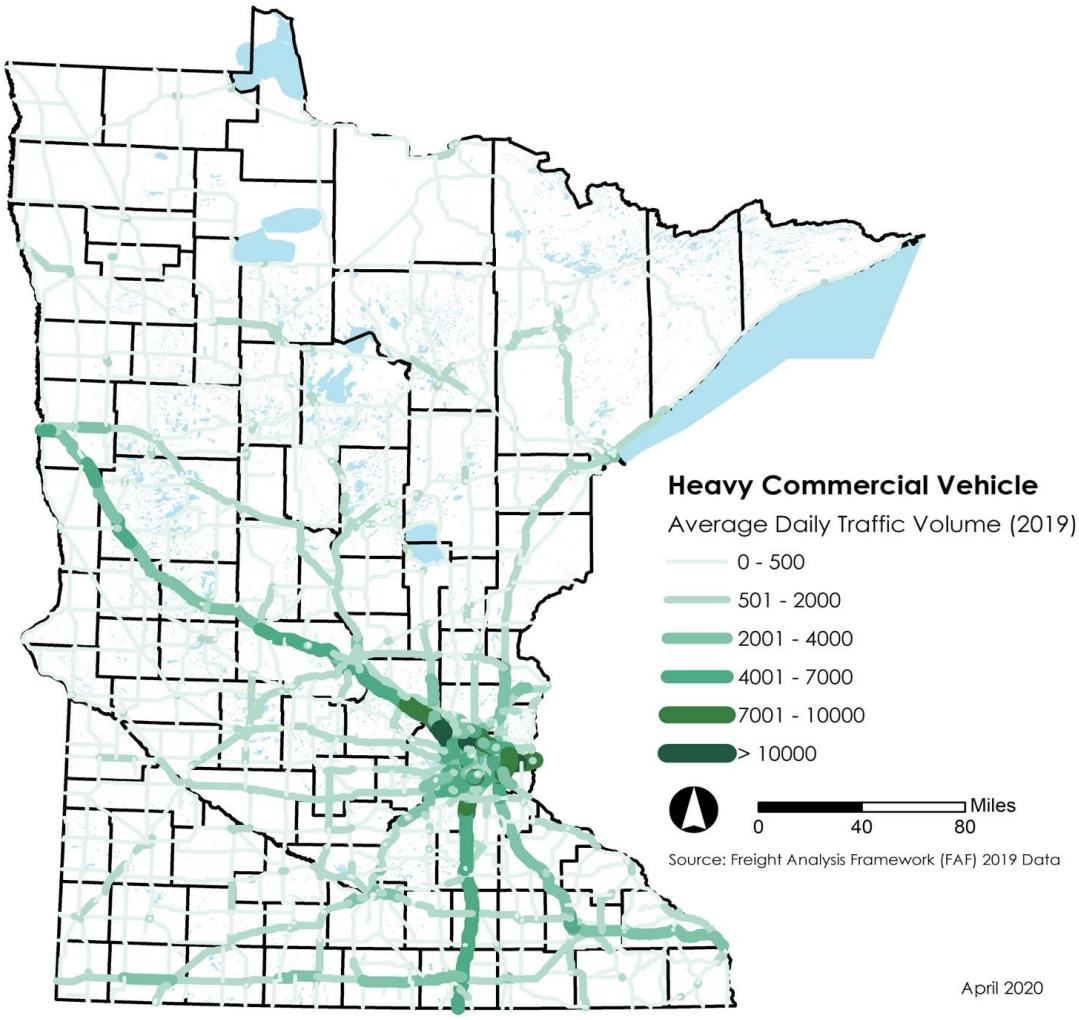
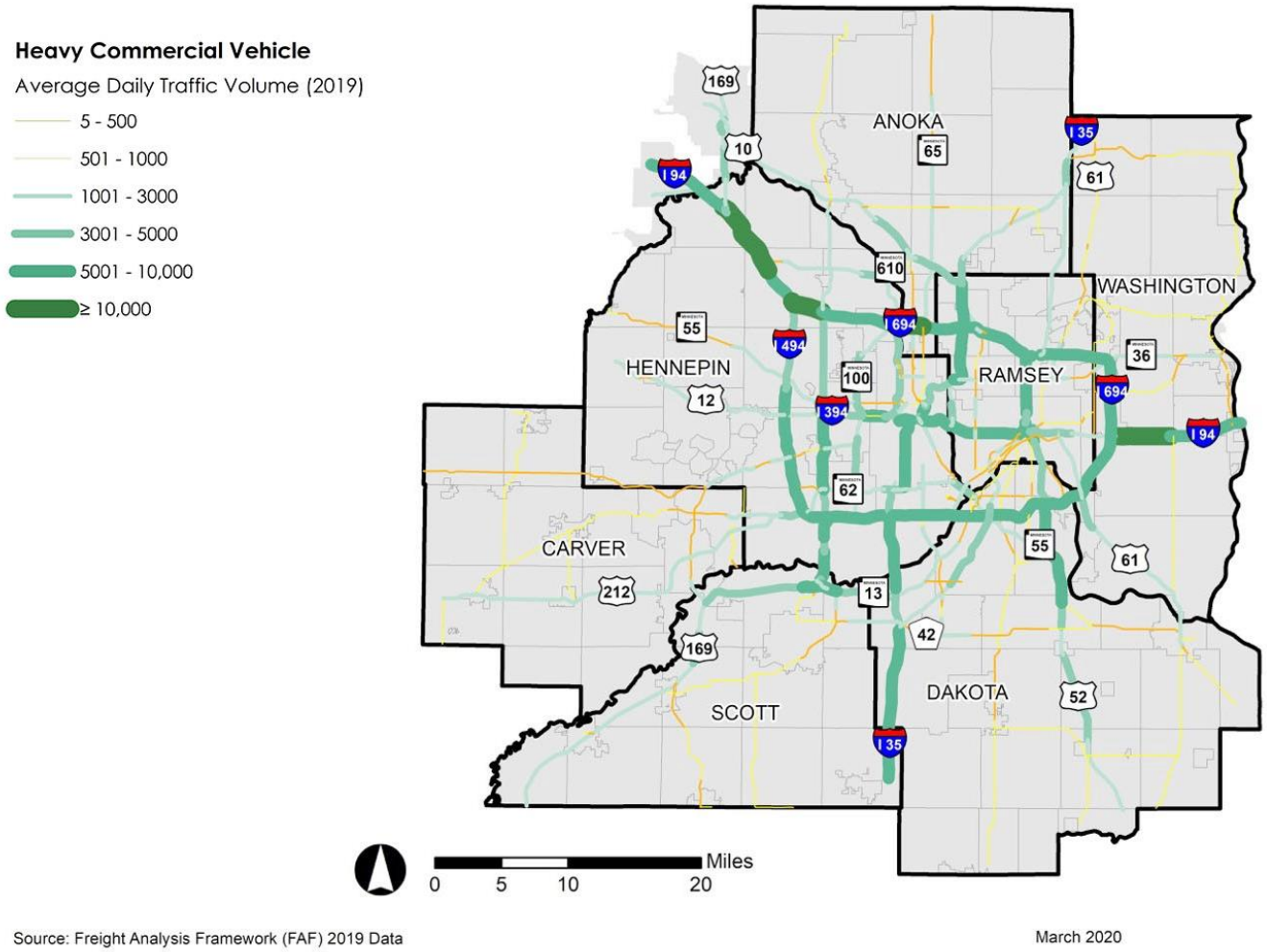


Figure 5-3: Twin Cities Region Estimated Daily Truck Volumes (2019)



Source: Freight Analysis Framework (FAF) 2019 Data

March 2020

Highway Congestion and Freight

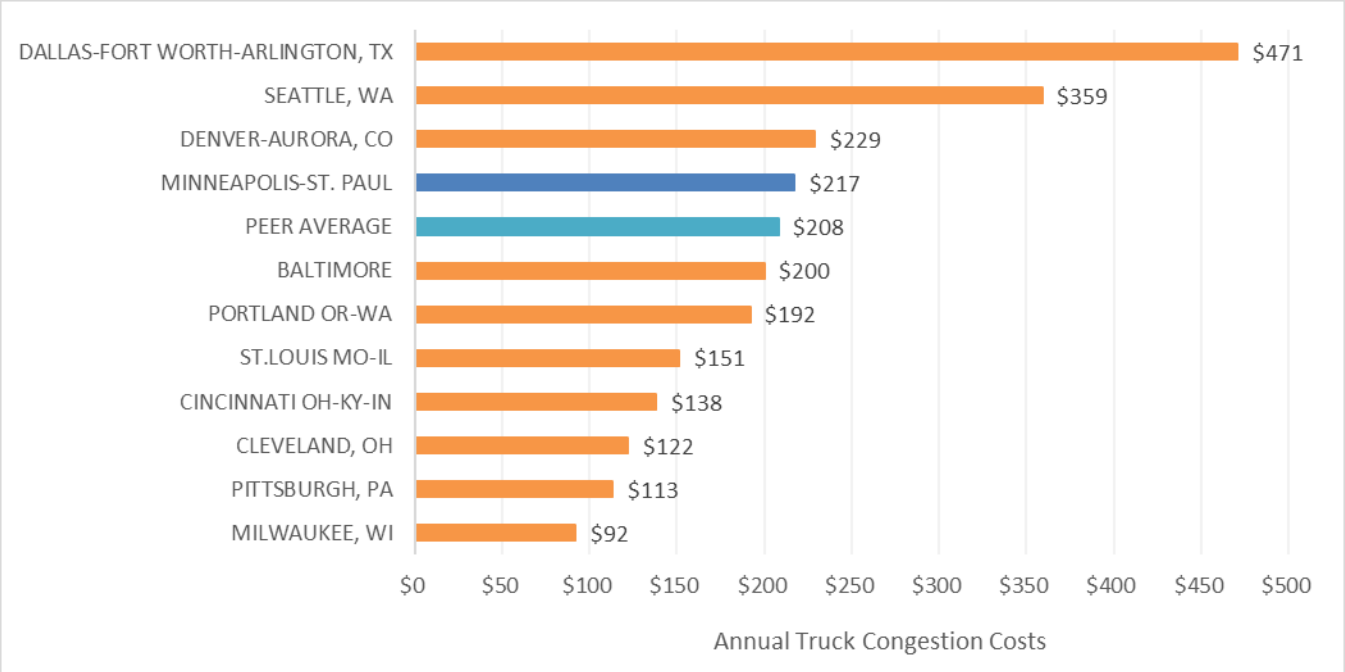
Highway congestion is often cited as a current and growing obstacle to efficient trucking operations in the Twin Cities. While other metropolitan regions have large freight activity centers with concentrated truck and rail activity focused in relatively few urban corridors, the Twin Cities typically has more and smaller freight centers distributed throughout the region. As a result, time delays from highway congestion may impact trucks to a similar degree as general traffic.

Cost of Truck Congestion

Highway congestion not only decreases the reliability of freight shipments, but also increases costs. The Texas Transportation Institute's (TTI) Urban Mobility Scorecard calculates truck congestion costs as the value of increased travel time and other operating costs of large trucks (estimated at $94.04 per hour of truck time in 2014) and the extra diesel consumed (using state average cost per gallon).

Figure 5-4 shows that truck congestion costs the region around $217 million per year. This value puts the region fourth highest among selected peer cities. Overall, the region ranks 19th in this measure compared to 47 large (1 million+) and very large (3 million+) regions as documented in the 2019 Urban Mobility Report by TTI.

Figure 5-4: 2017 Annual Truck Congestion Costs ($millions)

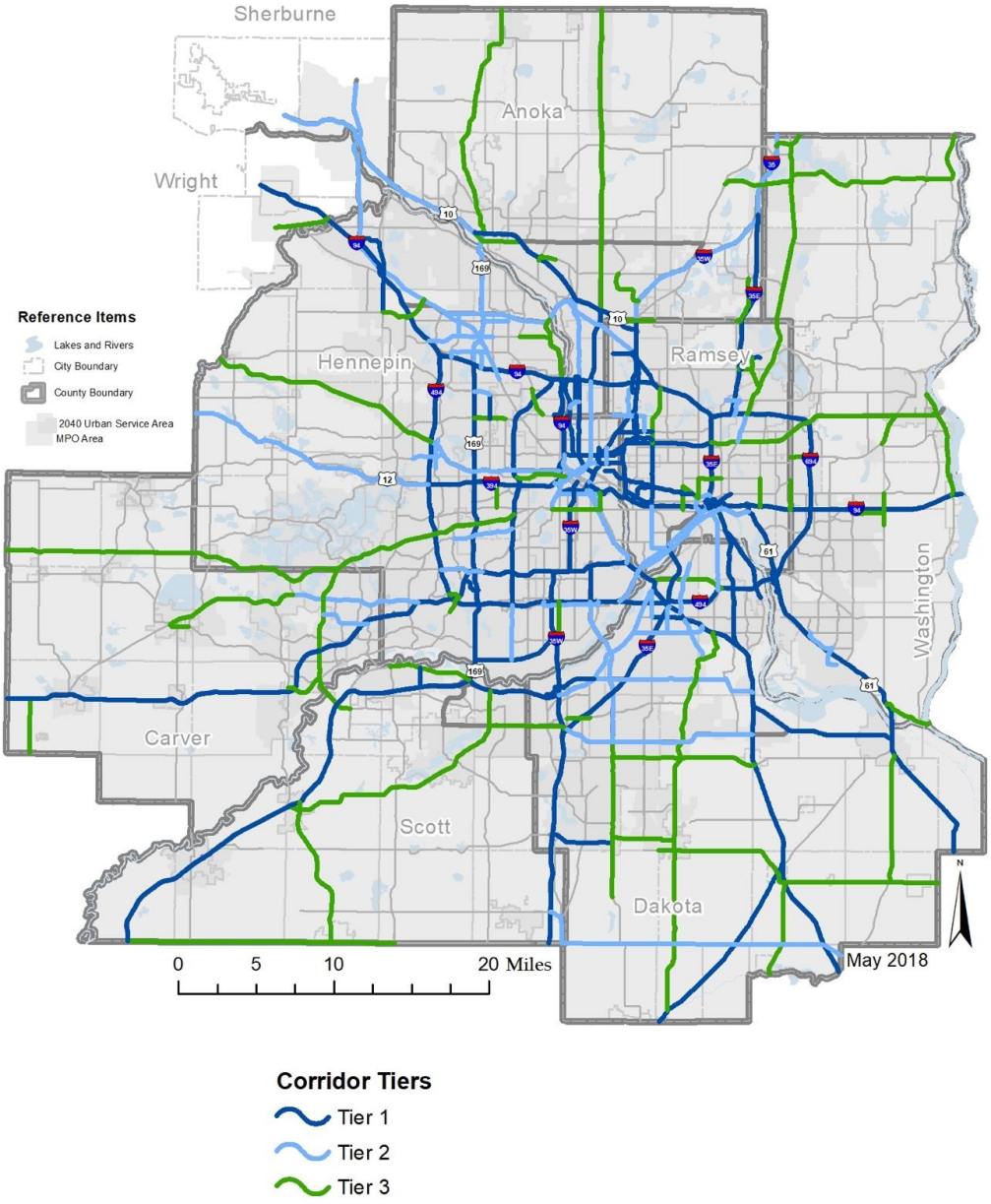


Source: 2019 Urban Mobility Report, Texas Transportation Institute

Regional Truck Freight Corridors

The efficient movement of freight is vital to the economic competitiveness of the Twin Cities metropolitan area, and truck highway corridors comprise a key component of the regional freight transportation system. A Regional Truck Highway Corridors study was completed in 2017 to identify and prioritize the region's major highway corridors upon which the trucking industry most relies. The study evaluated the metro area's highway corridors across four primary factors: average annual truck volume, truck percentage of overall traffic, proximity to freight-related economic centers, and proximity to regional freight terminals. The principal and minor arterial highways analyzed in the study were assigned to one of three priority tiers, using a data-driven scoring process. The tiered regional freight corridors shown in **Figure 5-5** are used in the biennial Regional Solicitation project selection process for distributing federal transportation funds.

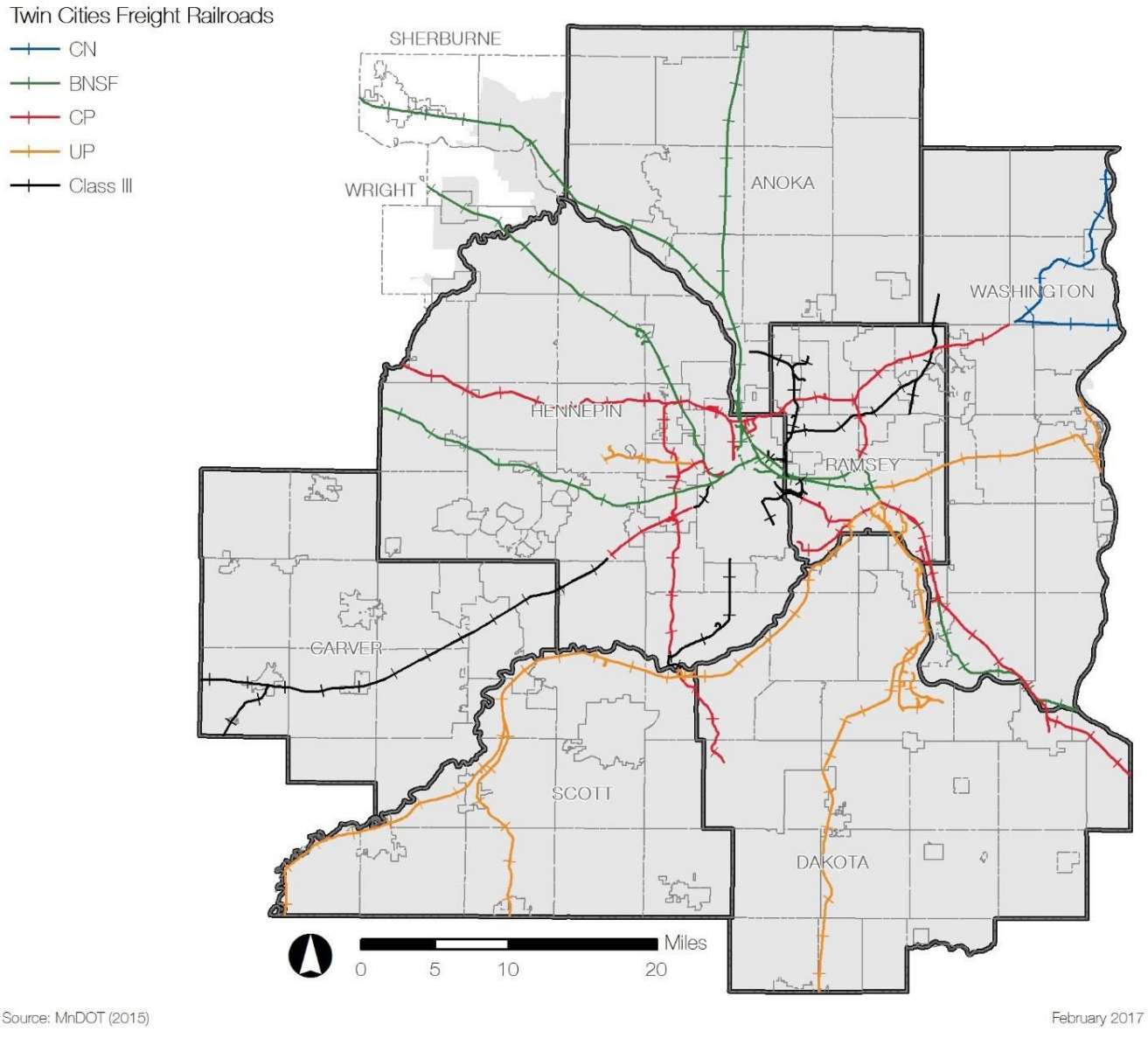
Figure 5-5: Regional Truck Freight Corridors



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 5-6**). These include the Burlington Northern Santa Fe Railway, Canadian National, Canadian Pacific Railway, and the Union Pacific Railroad Company. In addition, there are four short line (Class III) railroads including Progressive Rail, Twin Cities & Western, Minnesota Prairie Line, 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 5-6: Twin Cities Freight Rail Lines

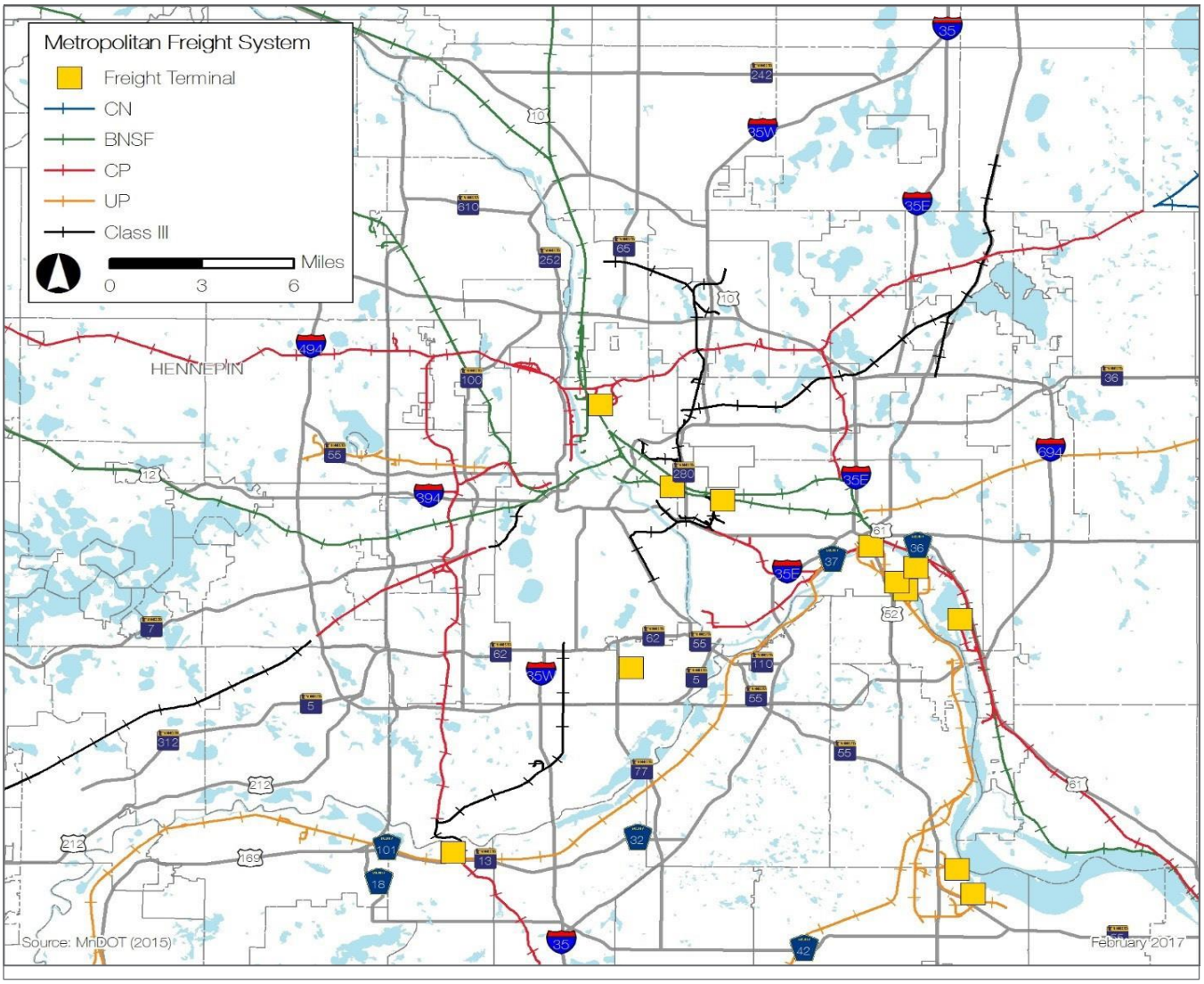


Intermodal Freight Terminals

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 Railroad and Canadian Pacific Railway. These intermodal rail terminals connect the Twin Cities to the Puget Sound and Canadian West Coast ports for trans-Pacific shipments and to Chicago for other domestic destinations, including East Coast ports for international shipments to Europe and other markets. Currently, no direct intermodal rail service exists between the Twin Cities and the California Ports of Oakland and Los Angeles/Long Beach. About 20 independently operated truck-rail transload/warehouse centers support the intermodal distribution of freight in the metro area. The regional rail system with major regional intermodal freight terminals is shown in **Figure 5-7**.

These intermodal rail terminals connect the Twin Cities to the Puget Sound and Canadian West Coast ports for trans-Pacific shipments and to Chicago for other domestic destinations, including East Coast ports for international shipments to Europe and other markets.

Figure 5-7: Twin Cities Railroads and Intermodal Terminals



Rail System Bottlenecks

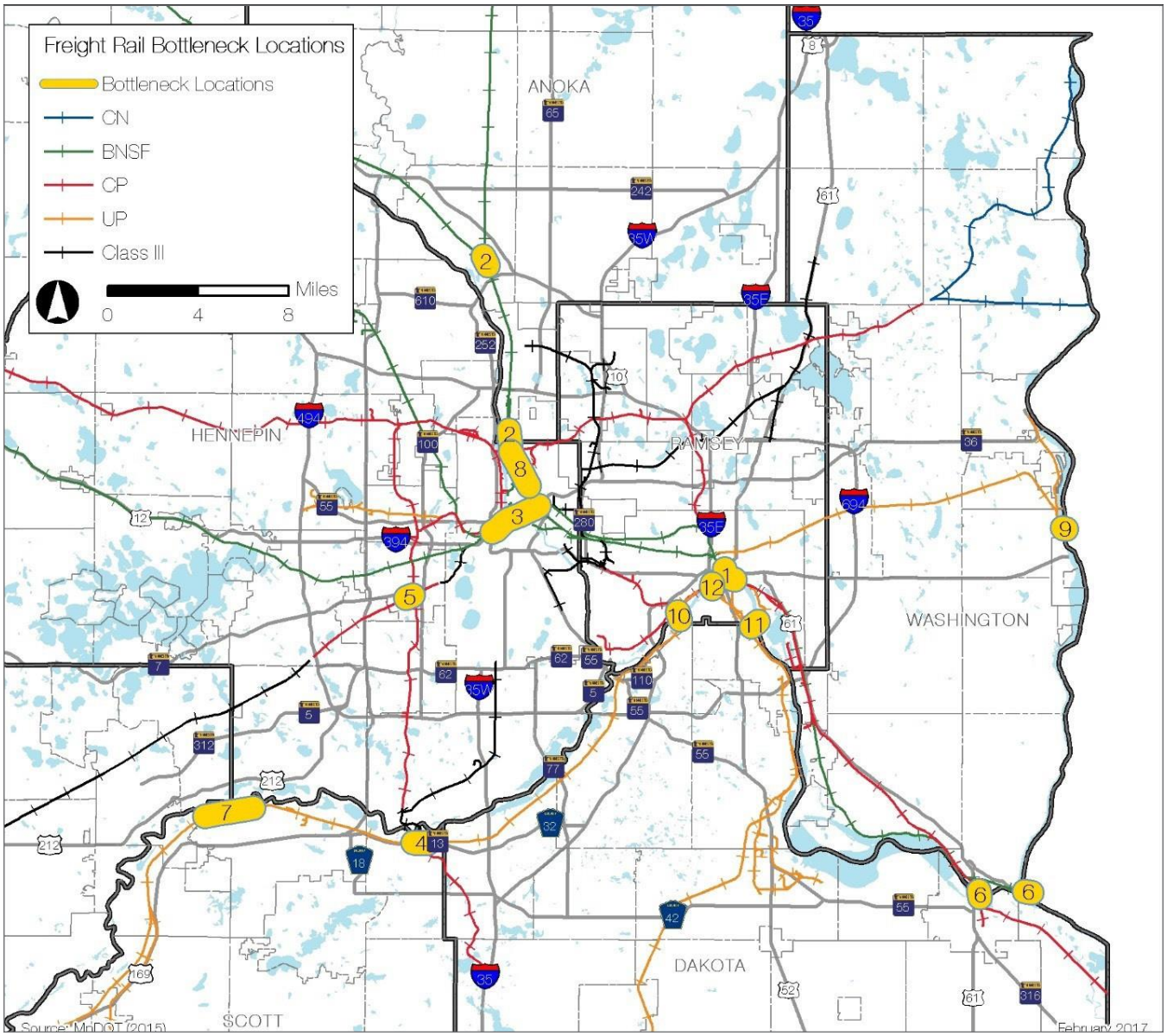
The region's freight railroads collectively moved approximately 26 million tons of freight to and from the 19-county Twin Cities CSA region in 2012 (not including through shipments), which represents about 15 percent of all freight moved to, from, or within the region. Portions of the regional rail system experience congestion, and MnDOT's State Rail Plan (March 2015) identified several major rail bottlenecks in the region including:

Portions of the regional rail system experience congestion, and MnDOT's State Rail Plan (March 2015) identified several major rail bottlenecks in the region.

1. Hoffman Junction and interlocking east of downtown St. Paul
2. Coon Creek Junction/BNSF Northtown Yard
3. Minneapolis Junction & BNSF Wayzata Sub
4. Savage Interchange
5. St. Louis Park Interchange
6. Canadian Pacific and BNSF southeast metro river crossings
7. City of Shakopee Track Realignment
8. University Interlocking
9. Hudson Bridge over the St. Croix River
10. Mendota Heights Bridge over the Mississippi River
11. Pigs Eye Bridge over the Mississippi River
12. Robert Street Bridge over the Mississippi

These rail system bottlenecks are shown by number in **Figure 5-8**. Many of these system bottlenecks will only become critical with the introduction of new or expanded intercity passenger rail service, including Amtrak expansion, expanded commuter rail service, and/or the increase of passenger rail service between the Twin Cities and Chicago. One existing rail congestion point that may reach a critical threshold prior to the advent of new or expanded passenger rail service is the Hoffman Junction and interlocking east of downtown St. Paul.

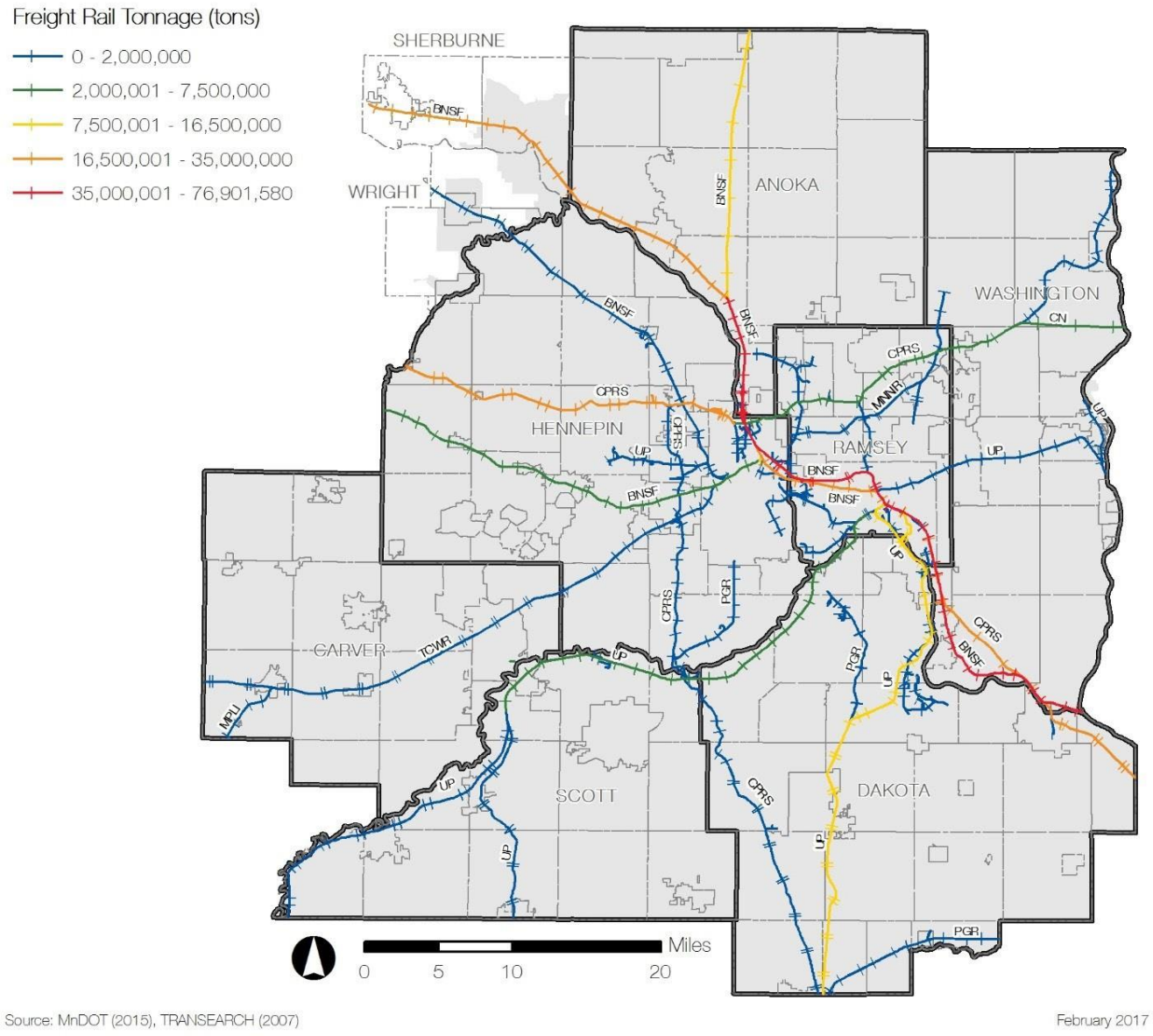
Figure 5-8: Freight Rail Bottleneck Locations



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 percent of the nation's freight rail operations (10,000 rail cars per day) transect this junction.

Figure 5-9 shows 2007 annual tonnage by rail carrier facility for the Twin Cities metropolitan area.

Figure 5-9: Twin Cities Annual Rail Freight Tonnage (2007)



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 5-3** shows rail-highway crossing data for the region. Approximately 36 percent of public rail crossings are 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 with fewer grade separations. Approximately 39 percent of public at-grade crossings have passive crossing warning devices while the remaining 61 percent of public at-grade crossings have active crossing warning devices such as gates, cantilevers, and flashing light signals.

Table 5-3: Metropolitan Rail System Crossing Data

Category	Number of Crossings			
Overall Track Miles	606			
Public Crossings	998	Number	% / Number	Percent
	Grade-separated	364	36.5%	
	At-grade crossing	634	63.5%	
		Active warning	389	61.4%
		Passive warning	245	38.6%
Private Crossings	337			
	Grade-separated	5	1.5%	
	At-grade crossing	332	98.5%	
		Active warning	4	1.2%
		Passive warning	328	98.8%
	Total At-grade Crossings per mile	1.6		
	Passive Crossings per mile	0.95		

Intermodal Yard Utilization

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 railroads in the Twin Cities. In 2011, the two intermodal yards were operating at approximately 84 percent of capacity in terms of potential container lifts. Both regional facilities are located proximate 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.

No new data were available for this report, but it is noted that container activity tends to mirror overall fluctuations in the regional economy. It would appear that intermodal activity at these terminals has been relatively flat since 2012, and some satellite container holding lots have seen a reduction in activity during this time.

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 destinations. 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.

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.

Air Freight Volume

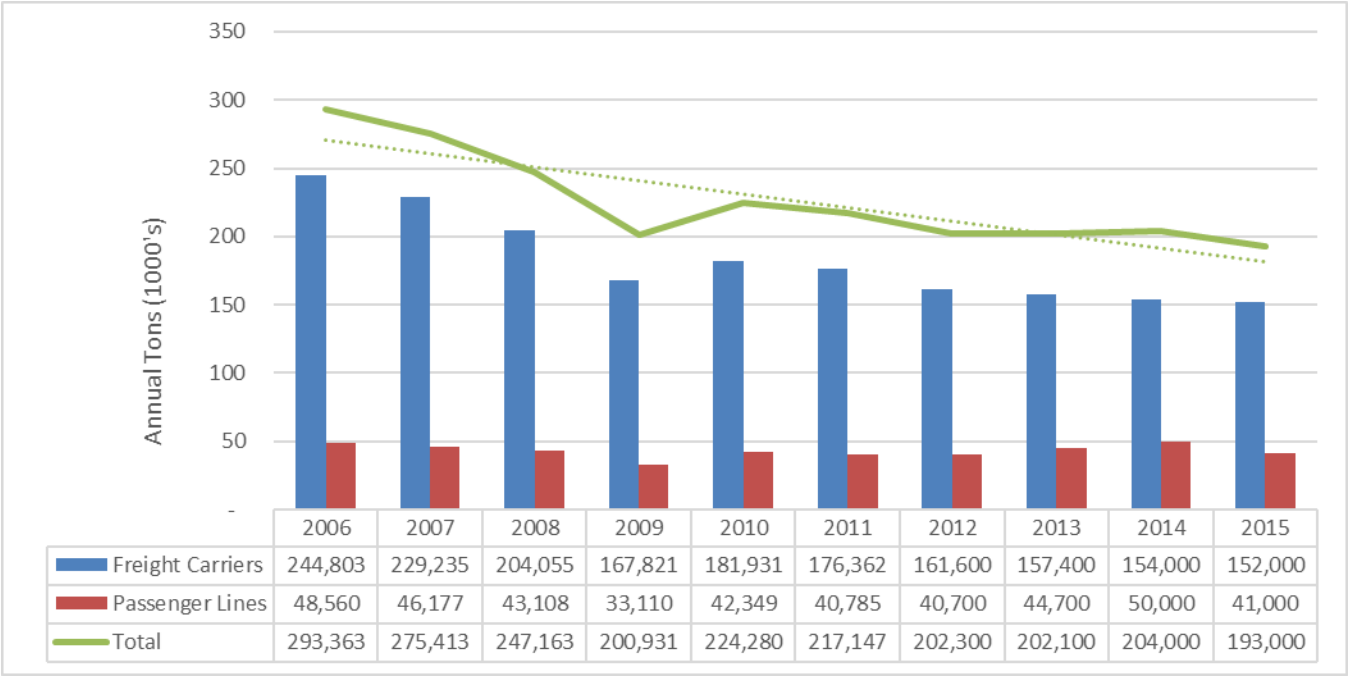
In 2015, MSP Airport handled about 193,000 tons of air freight via dedicated air freight carriers and in the cargo holds of passenger airlines. Air freight carriers carried around 80 percent of this cargo, with the remaining portion carried by passenger airlines. The relative proportions of freight shipped via these carrier classes between 2006 and 2015 are shown in **Figure 5-10**.

On average between 2010 and 2015, MSP Airport handled around 200,000 tons of air freight annually. This represents around 0.1 percent of the region's total tonnage. Although air cargo represents a small fraction of total freight movements, air freight is a key component of the freight transportation system, carrying around 5 percent of the region's freight value (see **Figure 5-1**). Industries such as bio-tech and high-tech manufacturing that tend to ship light weight, high-value and time-critical components depend on a robust and efficient air freight system on a daily basis.

Between 2006 and 2015 air freight shipped through MSP Airport experienced a downward trend with a total decline of about 34% in annual tonnage. The declining shipments corresponded to the onset of the Great Recession in 2008, followed by a low point in 2009 and modest recovery in 2010 to 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. There has also been an increase in freight exports transported by truck to be shipped out of O'Hare International Airport in Chicago. Shippers continue to take advantage of O'Hare's larger shipping blocks, better access to international markets, and lower air transportation costs.

Between 2006 and 2015 air freight shipped through MSP Airport experienced a downward trend with a total decline of about 34% in annual tonnage. The declining shipments corresponded to the onset of the Great Recession in 2008, followed by a low point in 2009 and modest recovery in 2010 to 2011.

Figure 5-10: Annual Air Freight Volume via MSP Airport



	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Freight Carriers	244,803	229,235	204,055	167,821	181,931	176,362	161,600	157,400	154,000	152,000
Passenger Lines	48,560	46,177	43,108	33,110	42,349	40,785	40,700	44,700	50,000	41,000
Total	293,363	275,413	247,163	200,931	224,280	217,147	202,300	202,100	204,000	193,000

Water

Waterway System

Today, there are two primary river ports in the Twin Cities metro region, the Port of St. Paul on the Mississippi River and the Ports of Savage on the Minnesota River. Additional river terminals in the south metro area are located in South St. Paul, Cottage Grove (Grey Cloud Island), and Rosemount. 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 markets. Sand for fracture mining of oil and natural gas is also shipped by barge down the Mississippi River and up the Ohio River to Pennsylvania. The region's two primary river ports contain approximately 32 active freight terminals.

The region's two primary river ports contain approximately 32 active freight terminals.

In June 2015, the Upper St. Anthony Falls Lock ceased operations, permanently terminating barge access to the upper Mississippi River. In its final year of operation in 2014, the lock carried approximately 700,000 tons of freight, and all remaining freight demands following the closure were shifted to other modes.

River Port Freight Tonnage

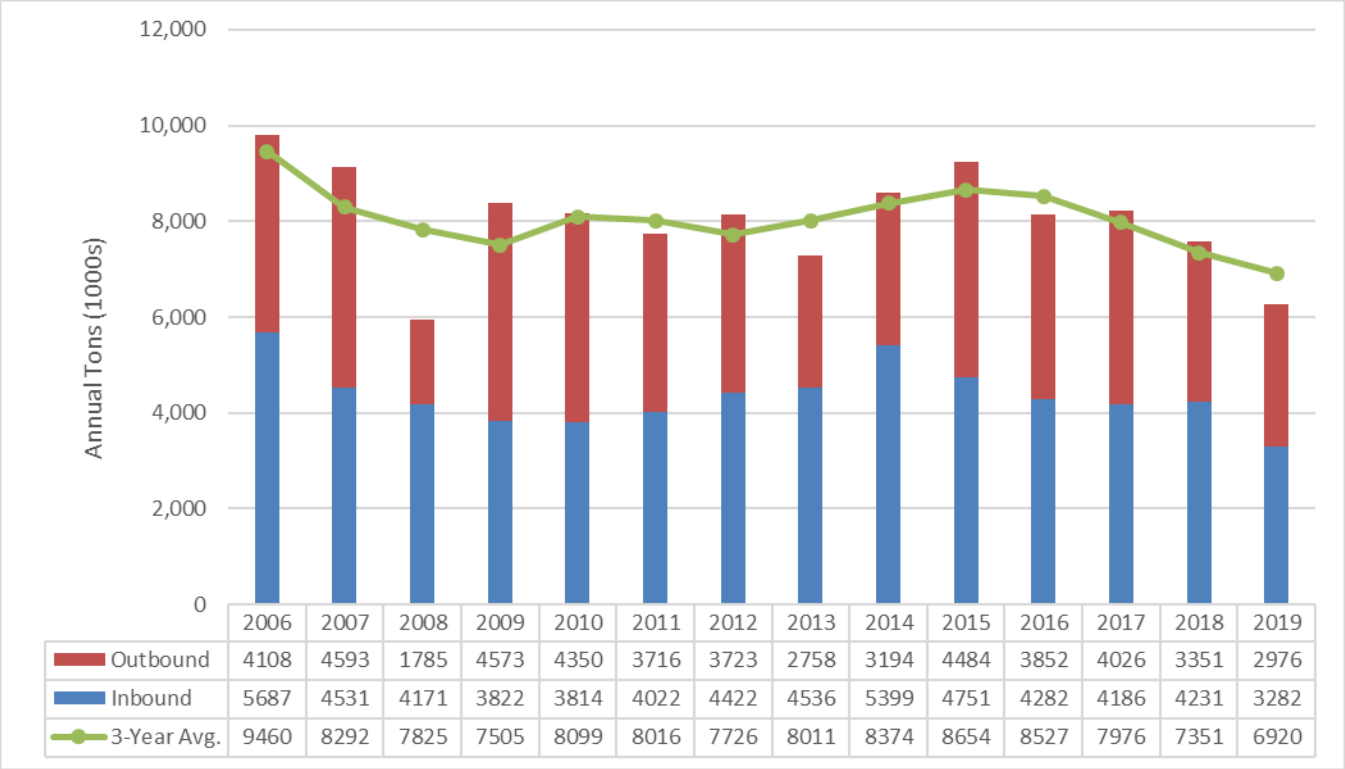
As shown in **Figure 5-11**, Twin Cities area river port freight volumes have experienced a downward trend between 2006 and 2018 with total volume decreasing by about 23%. However, much of this decline can be attributed to the Great Recession of 2008, as volumes have rebounded to 27% above that year's low point. In 2019, volumes dropped about 17.5% from 2018 levels, but this is seen as an aberration due to the much-shortened season caused by persistent spring flooding that led to the late opening to navigation of April 24th.

Since the recession in 2008, inbound and outbound freight volumes have trended differently: inbound barged freight has been mainly flat with a total increase of about 1.4% in the ten years following the recession, while outbound freight has had the more dramatic increase of nearly 88% during that time. These observed trends are consistent with previous reports and are evidence that outbound flows that are destined to foreign markets via New Orleans are sensitive to the more volatile global economic conditions and corresponding grain trade fluctuations.

Since the recession in 2008, inbound and outbound freight volumes have trended differently: inbound barged freight has been mainly flat with a total increase of about 1.4% in the ten years following the recession, while outbound freight has had the more dramatic increase of nearly 88% during that time.

Overall, the Port of St. Paul and south metro river terminals handle the vast majority of river-borne freight moved in the region, carrying about 75 percent of all barged freight in 2015. By comparison, the Ports of Savage handled about 23 percent and private terminals in Minneapolis handled about 2 percent in 2015, prior to the closing of the Upper St. Anthony Falls Lock that summer.

Figure 5-11: Twin Cities Annual Freight Tons by Barge



	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Outbound	4108	4593	1785	4573	4350	3716	3723	2758	3194	4484	3852	4026	3351	2976
Inbound	5687	4531	4171	3822	3814	4022	4422	4536	5399	4751	4282	4186	4231	3282
3-Year Avg.	9460	8292	7825	7505	8099	8016	7726	8011	8374	8654	8527	7976	7351	6920

Findings and Conclusions

Freight shipments to and from the region have recovered from 2008 recession levels, and total tons of freight shipped to and from the region in 2012 exceeded those levels. The following findings and trends provide an overview of the freight system performance since 2006

- Tonnage of freight shipments into the region increased by a greater percentage than freight shipments out of the region between 2007 and 2012 (42% versus 15%)
- In 2012, total tonnage of freight shipments into the region was 25 percent greater than freight shipments out of the region
- Freight tonnage shipped within the region decreased by 24 percent between 2007 and 2012
- Trucking remained the dominate mode for freight, with trucks carrying about 2/3 of total freight tonnage into and out of the region in 2012
- Annual truck congestion costs, which includes added travel time and operational costs to trucks due to congestion, was about $217 million in 2017 regionally, ranking 19th among metropolitan regions nationwide
- Rail continued to carry a significant percentage of freight, moving approximately 25 percent of all freight tonnage into and out of the region in 2012
- Total volume of air freight shipped experienced a steady downward trend between 2006 and 2015 with a total decline of about 34%; however, since the low point in 2009, annual tonnage has declined by only about 4%.
- Freight tonnage volume hauled by barge dropped significantly during the Great Recession of 2008, but since has rebounded to 27% above the 2008 low point.

Freight shipments to and from the region have recovered from 2008 recession levels, and total tons of freight shipped to and from the region in 2012, exceeded 2007 levels.

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Chapter 6: The Bicycle and Pedestrian System

Bicycling and walking have become increasingly important in the Twin Cities for commuting to work or school, running personal errands, and traveling to entertainment and activity venues. The potential for further expanding bicycling and walking in the region for transportation purposes is significant.

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The region has long recognized that bicycling and walking are essential modes of transportation. This recognition has developed significantly in recent years in response to development of the regional transitway system, the establishment of the Regional Bicycle Transportation Network, and our growing awareness of the significance of first- and last-mile connections to regional transportation facilities and destinations. While planning for specific pedestrian improvements is led by counties and municipalities, the region recognizes that everyday bicycle trips often cross jurisdictional boundaries and warrant regional coordination in planning and implementation. The beginning of this chapter focuses largely on regional bicycle transportation, and the chapter concludes with discussion of both bicycling and walking.

Characteristics of the Regional Bicycle System

The Minneapolis-St. Paul region is fortunate to have 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 comparatively strong level of support for this culture of bicycling.

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The foundation for the region's extensive bicycle infrastructure is the system of off-road trails that connects regional parks, and traverses lakes and rivers and was made possible by the abundance of abandoned rail corridors. The support for the continuing development of this impressive system, much of it coordinated by the Metropolitan Council's parks department, 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. The first parks were built in the early 20th century, and the system of paved regional trails that developed to connect them remain among the most used bicycle facilities in the region. The region embarked on the development of the regional trail system in the 1980s while new suburban communities built local trail systems as they developed. Since the early 2000s, the region has continued to build out the trail system and rebuild some of the older trails, including those in the Minneapolis parks system.

On-street bikeways come in many forms as well. There are on-street bike lanes, designated bicycle shoulders (with or without signage), roads with shared road markings known as "sharrows," and bicycle boulevards which are low-volume, low-speed local streets often accompanied with vehicle traffic attenuators such as intersection "traffic islands." There are also bike routes without minimum standard bike lanes or shoulders, but are designated with signage to indicate their more bike-compatible, low traffic characteristics. Individuals who use their bicycle for transportation will find themselves on routes that include all of these types of bikeway.

Bicycle Infrastructure Planning and Development

The Metropolitan Council plays an important role in the development of the regional bikeway system through long range planning and coordination with state and local agencies. With few exceptions the Council generally does not own or maintain any bicycle facilities; however, the Council's policies influence their development through its coordination and planning role for the Regional Parks system (including regional trails), and in its role as the region's federally-designated Metropolitan Planning Organization (MPO) responsible for long range transportation planning and programming of federal transportation funds. Through its MPO role, the Council updates the region's long-range Transportation Policy Plan every four years, providing policies, goals and strategies to guide all surface modes of transportation, plus aviation, for the metropolitan region.

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The Regional Bicycle Transportation Network

The Regional Bicycle Transportation Network (RBTN), first established in the 2014 update to the TPP, represents the vision for developing a regional network and sets the priorities for regional bicycle planning and investment.

As shown in **Figure 6-1**, the RBTN consists of a series of prioritized alignments and broad planning corridors and includes the established set of regional destinations the network is intended to connect. The purpose of the RBTN is shaped by the following goals:

- Establish an integrated/seamless network of on- and off-street bikeways
- Provide the vision for a "backbone" arterial network to accommodate daily bicycle transportation to and between regional destinations
- Encourage cities, counties, park agencies, and the state to plan and implement future bikeways that support the regional network vision.

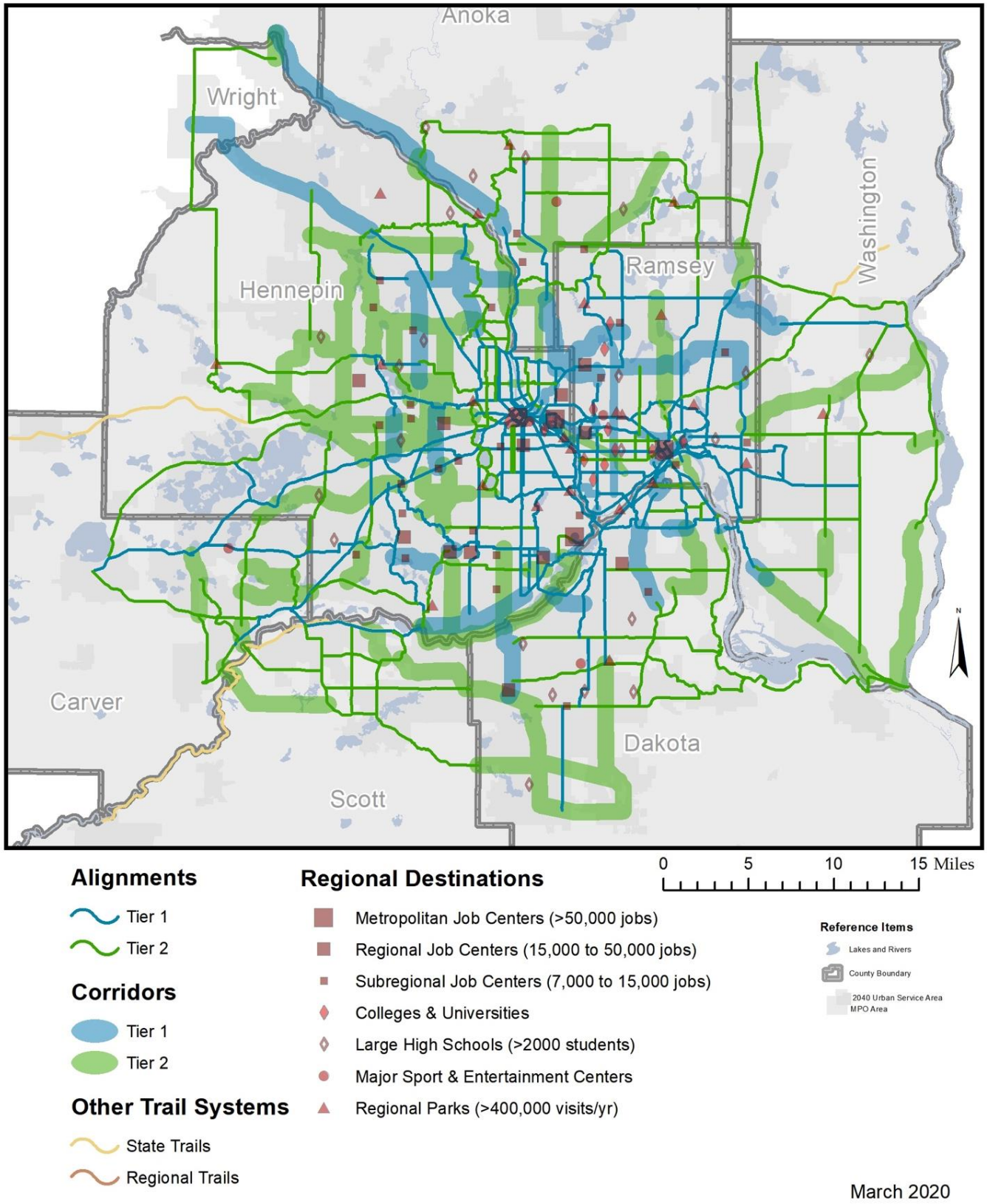
The RBTN corridors are established where there is existing high bicycle trip demand or future potentially high demand and where specific alignments have not been designated by local agencies. RBTN alignments represent where local plans have identified existing or planned off-street trails or on-street bikeways.

The network is divided into Tier 1 and Tier 2 priority alignments and corridors based on potential bicycle demand levels as determined in the Regional Bicycle System Study. In 2020 there were more than 1,500 centerline miles of designated regional bicycle network corridors and alignments included in the RBTN. This mileage total compares very favorably to other metro regions around the nation that have established regional bicycle networks. **Table 6-1** shows the implementation status of RBTN alignments and corridors. At this writing about 848 miles or 56% of total RBTN miles had an existing bicycle facility; 660 miles of bikeway were planned of which 229 miles (35%) were designated alignments and 431 miles (65%) were planned corridors. For existing bikeways, about 76.5% of the total miles are off-road trails and 24.5% are on-street facilities.

Table 6-1: RBTN Implementation Status

RBTN Category	On Street	Off-Street	Undefined	Total	% of Planned	% of Total
Existing Bikeways (Alignments)	199	649	0	848		56.2%
Planned Bikeways						
RBTN Alignments	28	140	61	229	34.7%	
RBTN Corridors	0	0	431	431	65.3%	
Total Planned	28	140	492	660	100.0%	43.8%
Total RBTN Centerline	227	789	492	1508		100.0%

Figure 6-1: Regional Bicycle Transportation Network



Regional Bicycle System Inventory

The Council has developed a Regional Bicycle System Inventory in collaboration with the counties who have coordinated with their municipalities to provide a region wide reference mapping platform. This database includes all the existing and planned trails and on-street facilities from most cities that have developed local bicycle networks. Summary statistics of the overall regional system are shown in **Table 6-2**.

Table 6-2: Regional Bikeway System Mileage Summary

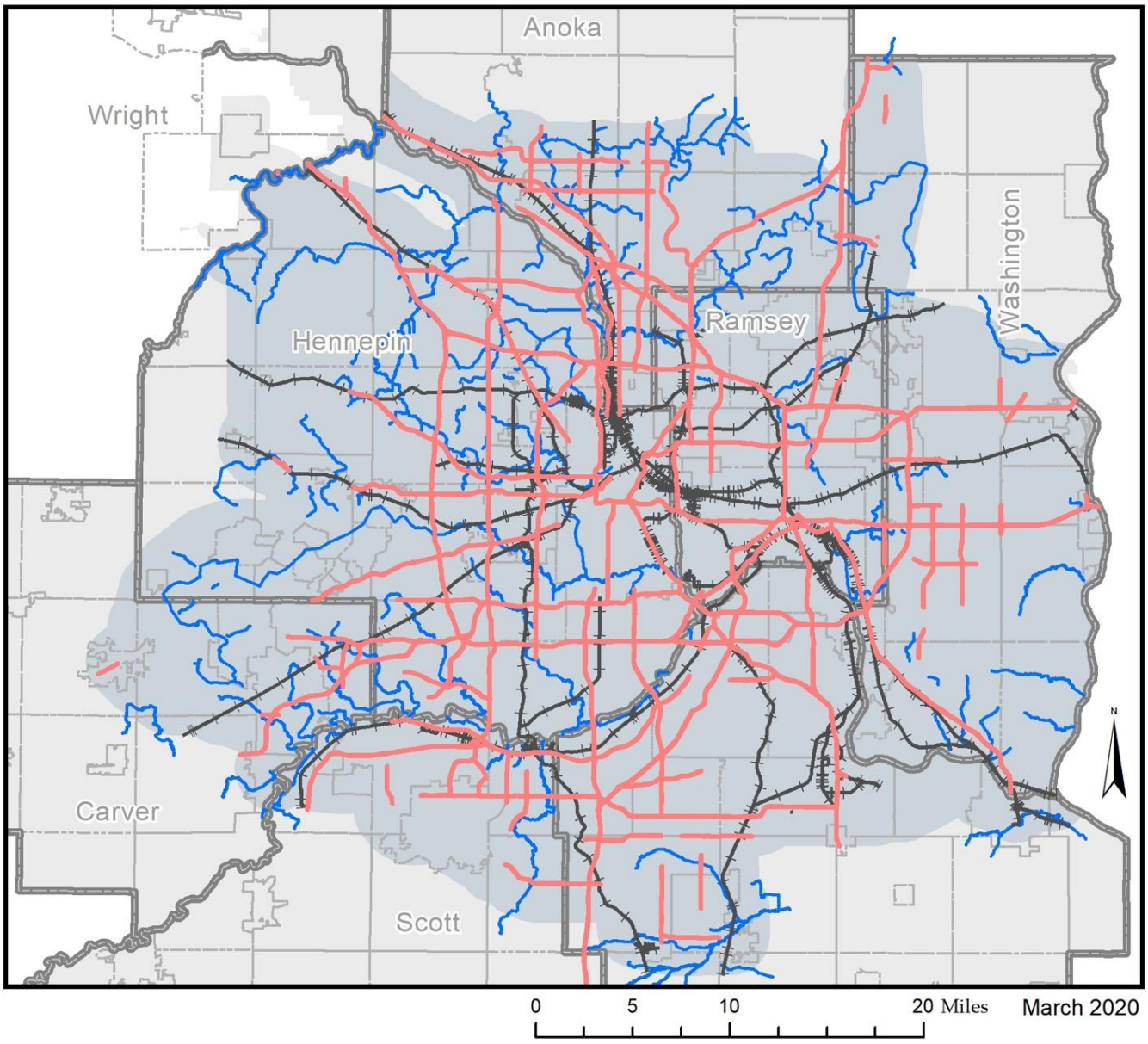
Type	On-street	Off-street	Undefined	Total
Existing	1,878	2,030	1	**3,909**
Planned	1,032	820	1,013	**2,865**
Total	**2,910**	**2,850**	**1,014**	**6,774**

Table values are Council-estimated RBTN centerline miles.

Regional Bicycle Barriers Study

In 2019, the Metropolitan Council updated its Regional Bicycle Barriers Study that analyzed the need for bikeway improvements across the region's major physical barriers. Physical barriers were defined to include secondary rivers and streams, railroad corridors, and freeways and expressways. Regional bicycle barriers are shown in **Figure 6-2** and are used to guide regional investments in bicycle infrastructure through the Regional Solicitation of federal transportation funds, as well as other state and local programs that fund projects in the region.

Figure 6-2: Regional Bicycle Barriers



Walking and Bicycling for Transportation

Regional Mode Share

The 2019 Travel Behavior Inventory (TBI) conducted by the Metropolitan Council is the eighth in a series of studies done every five to ten years to discover where, when, why and how people travel in the region. According to the 2019 TBI, 8.5% of all trips made within the seven-county region are done by walking, and 0.9% of all trips are made by bicycle. Between 2010 and 2019, the share of walking trips within the region increased 2.4 percentage points and the share of bicycling trips decreased by 0.7 of a percentage point.

The 2019 TBI 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 overall. Walking rates are nearly double in the central cities, where 14.1% of all trips are made on foot. Bicycling trips in the central cities also occur at more than twice the rate compared to the region as a whole: 2.1% of trips in the central cities are made by bicycle, compared to less than 1% regionally. **Table 6-3** compares mode share for all trips in Minneapolis/St. Paul, outside the core cities, and for the region as a whole.

Table 6-3: Regional and Core Cities Mode Share – All Trips

Trip Mode	Minneapolis & St. Paul Only	Outside Core Cities	Region
Bicycle	2.1%	0.6%	0.9%
Walk	14.1%	6.9%	8.5%
Transit	7.6%	1.9%	3.2%
Drive	74.4%	88.6%	85.4%

Source: 2019 Travel Behavior Inventory, Met Council

Commute Trips to Work and School

Within the region, bicycle commute trips to work and school account for about 35% of all bicycle trips, while walk commute trips to work/school make up 10% of all walk trips, according to the 2019 TBI. This observation could lead one to conclude that biking is more significant for commute trips than walking; however, given the fact that walking is a component of every trip over any given mode, a more accurate assessment would give at least equal significance to walking for transportation.

Table 6-4 provides a regional comparison of work and work/school commute trip mode shares with all trip mode shares. While bicycle trip mode share stays the same for work versus work-plus-school commute definitions, walking and transit use increase by roughly 41% and 18%, respectively. When comparing either commute grouping with all trips, biking, driving, and transit mode shares all decrease, but walking takes up the balance with an increase of 5 times, or 400%. This demonstrates the overall importance of walking during all times of day and for all trip types.

Table 6-4: Regional Commute versus All Trips Mode Share

Trip Mode	Work Commute Trips	Work + School Commute Trips	All Trips
Bicycle	1.3%	1.4%	0.9%
Walk	1.7%	2.4%	8.5%
Transit	4.5%	5.3%	3.2%
Drive	92.3%	85.4%	85.4%
Other	0.2%	5.5%	1.9%

Source: 2019 Travel Behavior Inventory

Minneapolis leads the region in bicycle commute mode share. The American Community Survey, conducted every year by the U.S. Census Bureau, estimated that 3.7% of city workers commuted by bicycle in 2016. This ranks Minneapolis 23rd in bike commuting among the top 20 cities nationally, and fourth among cities with populations between 200,000 and 300,000.

Regional Travel Statistics

Daily Miles Traveled

According to the 2019 TBI, about 550,000 miles are traveled each day by walking, and roughly 260,000 miles are traveled daily by biking. (It should be noted that the estimated miles walked do not include walking segments of trips completed using multiple modes.)

Average Distance and Trip Duration

Table 6-5 compares average and median trip distance and duration for biking, walking and driving. Although distances vary greatly between the modes, the duration of trips are relatively similar, especially for biking and driving. The duration acceptance for bicyclists is the same as that of drivers, but walkers are less inclined to travel as far, or as long, as cyclists and drivers.

The region started using a new performance indicator called "mode participation rate" defined as the percent of population that make at least one trip by a certain mode on a given day.

Table 6-5: Regional Average Trip Distance/Duration by Mode

Trip Mode	Average Trip Distance (miles)	Median Trip Distance (miles)	Average Trip Duration (minutes)	Median Trip Duration (minutes)
Walk	0.8	0.4	21.3	14.6
Bike	3.4	2.1	31.3	24.2
Drive	7.9	4.1	31.3	22.7

Source: 2019 Travel Behavior Inventory, Met Council

Mode Participation Rate

The region started using a new performance indicator known as the "mode participation rate." This rate is defined as the percent of population that make at least one trip by a specific mode on a given day. The current mode participation rate for walking is 23.4% and for bicycling is 2.9%; the walking participation rate nearly doubled from 12.2% since 2011, while the biking participation rate stayed the same at 2.9%.

Walking and Bicycling Volume Counts

The two largest cities in the region, Minneapolis and Saint Paul, have been conducting regular bicycle and pedestrian counts for several years. In Minneapolis, the city counts bicyclists at 30 benchmark locations and pedestrians at 23 benchmark locations each year. Minneapolis also has over 380 additional locations where it counts bicyclists and pedestrians on a three-to-four-year rotation. In Saint Paul, the city counts bicyclists at 30 benchmark locations and pedestrians at 25 benchmark locations each year. Collecting this data at consistent benchmark sites allows the cities to measure trends in bicycling and walking over time. For example, in its 2018 Bicyclist and Pedestrian Count Report, the City of Minneapolis shows that from 2007 to 2017, bicyclists have increased 53% and pedestrians have increased 21% at the annual benchmark locations.

As part of its Minnesota Bicycle and Pedestrian Counting Initiative, MnDOT developed a Bicycle and Pedestrian Data Collection Manual to supplement the FHWA Traffic Monitoring Guide.

In addition to these data collection efforts, more guidance has been developed to support local communities in collecting this data. The Federal Highway Administration (FHWA) updated its Traffic Monitoring Guide to include guidance for counting bicyclists and pedestrians. As part of its Minnesota Bicycle and Pedestrian Counting Initiative, MnDOT developed a Bicycle and Pedestrian Data Collection Manual to supplement the FHWA Traffic Monitoring Guide.

Since 2014, MnDOT's Bicycle and Pedestrian Counting Initiative further expanded the work within the state to institutionalize this data collection. Some of the highlights of this work included annual training programs; the installation of 25 permanent monitoring stations throughout the state, including three in the Twin Cities region; and the development of a MnDOT district-based portable counting equipment loan program to support MnDOT districts and local governments in conducting bicycle and pedestrian counts.

In 2018, MnDOT convened the Minnesota Bicycle and Pedestrian Data Task Force, a group of state, regional, and local partner agency stakeholders working to coordinate data collection, sharing, and analysis. In 2019, MnDOT developed a Strategic Plan for Counting People Walking and Bicycling for their Pedestrian and Bicyclist Data Program. The plan developed goals, strategies, and actions for MnDOT's statewide program to further institutionalize this data collection.

Safety of Pedestrians and Bicyclists

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

Pedestrian and Bicyclist Injuries and Fatalities

According to crash data from the Minnesota Department of Public Safety, between 2014 and 2018, there were 1,324 total traffic fatalities in Minnesota, 25 percent of which occurred in the region, or 333. Of these 333 traffic fatalities in the region, 112 were pedestrian fatalities, and 17 were bicyclist fatalities.

Pedestrians and bicyclists are the most vulnerable users on the road. The seven-county Twin Cities region had an average of 22 pedestrian deaths and 3 bicyclist deaths from traffic crashes each year from 2014-2018. In the same period across the region, an average of 522 pedestrian injuries occur per year, in addition to 409 bicyclist injuries.

Comparison with all traffic crashes in Minnesota puts these bicycle and pedestrian crashes in context. While 25 percent of the overall traffic fatalities occur here, the region's share of crashes looks much different for pedestrians and bicyclists because of its more urbanized area. Although the region on average has 25 percent of the overall traffic fatalities within the state, 55 percent of statewide pedestrian fatalities and 49 percent of statewide bicyclist fatalities occurred within the region. While walking trips are 6 percent of all trips made within the region, pedestrian fatalities are a disproportionately larger percentage of the region's traffic deaths; almost 17 percent 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 5 percent of all Twin Cities traffic fatalities, compared to making 2 percent 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.

Although the region on average has 25 percent of the overall traffic fatalities within the state, 55 percent of statewide pedestrian facilities and 49 percent of statewide bicyclist fatalities occurred within the region. Pedestrian fatalities are a disproportionately larger percentage of the region's traffic deaths. The numbers are not as disproportionate for bicyclists in the region.

Local Bicycle and Pedestrian Planning Statistics

In 2019 local governments were still in the process of updating their comprehensive plans. Based on policy reviews of the plans received and approved to date, **Table 6-6** provides a summary of selected bicycle and pedestrian plan attributes.

Table 6-6: Local Comprehensive Plan Summary of Bike and Pedestrian Plan Attributes

Policy Attribute	# of Comp Plans w/Attribute	% of Plans Reviewed w/Attribute[5]
On-Street Bike Facilities	41	62.1%
Specific Pedestrian Facilities	40	60.6%
Specific Bicycling Policies	35	53.0%
Sidewalk/Sidewalk Gaps Mapped	29	43.9%
Separate Bike Plan/Element	27	40.9%
Covers ADA Compliance	19	28.8%
Complete Streets	12	18.2%

[5] Equals the proportion of the 66 comp plans received and reviewed for bike/pedestrian attributes

Findings and Conclusions

Bicycling and walking have become increasingly important in the Twin Cities for commuting to work or school, running personal errands, and traveling to entertainment and activity venues. The region has a strong policy foundation for enhancing the already well-established regional bicycle and pedestrian systems, and there is significant potential for further expanding bicycling and walking in the region for transportation and recreation.

The region has a strong policy foundation for enhancing the already well-established regional bicycle and pedestrian systems, and there is significant potential for further expanding bicycling and walking in the region for transportation and recreation.

- The region has recognized for many years that bicycling and walking are essential modes of transportation. This understanding has grown significantly in recent years in response to development of the regional transitway system, the establishment of the RBTN, and our increased understanding of the importance of first- and last-mile connections to these major regional transportation networks.
- The Regional Bicycle Transportation Network consists of more than 1,500 miles of existing, planned, or anticipated on- and off-road bicycle facilities; the network's overall coverage and density compares favorably with other metro areas that have developed regional bicycle networks.
- According to the 2019 TBI, 8.5% of all trips made within the seven-county region are done by walking, and 0.9% of all trips are made by bicycle. Between 2010 and 2019, the share of walking trips within the region increased 2.4 percentage points and the share of bicycling trips in the region decreased by 0.7 of a percentage point.
- Trip mode shares for walking and biking are highest in the core cities with a 2.1% bike mode share and a 14.1% walking mode share.
- Based on estimates derived from TBI data, about 550,000 daily miles are traveled in the region by walking, and roughly 260,000 miles per day are traveled per day by bicycle.
- Bicycling and walking volumes are increasing in many cities. In its 2018 Bicyclist and Pedestrian Count Report, the City of Minneapolis reported that from 2007 to 2017, bicycling increased 53% and walking increased 21% at the city's annual benchmark locations.
- Although the region has only about 25%, on average, of overall traffic fatalities within the state, 55% of statewide pedestrian fatalities and 49% of statewide bicyclist fatalities occurred within the region.
- City, county, and regional transportation plans significantly support biking and walking as practical choices for daily travel within the region.

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Chapter 7: The Aviation System

Characteristics of the Regional Aviation System

Infrastructure

The Twin Cities region has eleven airports, 1 primary large hub 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.

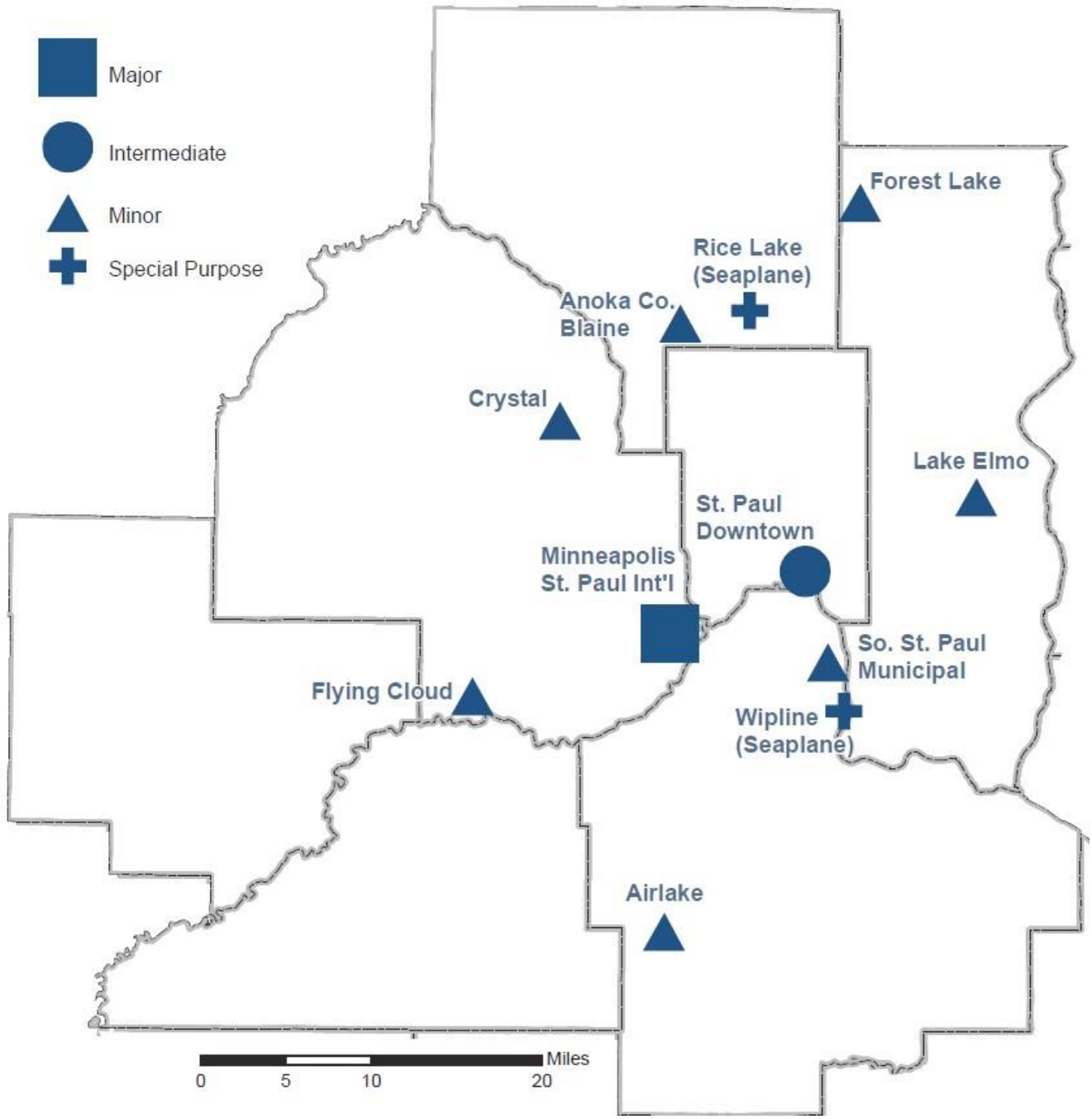
The airport and airspace interaction within the regional system and its relationships to the state and national systems is somewhat like a chess board in that what changes at one facility can have ramifications in terms of user behavior, business decisions, airport management actions, and government 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	National Plan of Integrated Airports System (nPias) Status	MN State Aviation System Classification	Met Council Regional System Plan
Minneapolis-St. Paul International Airport (MSP)	Primary – Large Hub Commercial Service Primary	Key	Major
St. Paul Downtown (STP)	National	Key	Intermediate
Flying Cloud (FCM)	National	Key	Minor
Airlake (LVN)	Regional	Intermediate	Minor
Anoka County/Blaine (ANE)	National	Intermediate	Minor
Crystal (MIC)	Regional	Intermediate	Minor
Lake Elmo (21D)	Regional	Intermediate	Minor
South St. Paul (SGS)	Regional	Intermediate	Minor
Forest Lake (25D)	Not in NPIAS	Landing Strip	Special Purpose
Surfside Seaplane Base (8Y4)	Not in NPIAS	Landing Strip	Special Purpose
Wipline Seaplane Base (09Y)	Not in NPIAS	Landing Strip	Special Purpose

Figure 7-1: Regional Airports by System Role



Pavement Conditions

MAC maintains an ongoing pavement management program at each of the six MAC-owned reliever airports. MnDOT maintains a pavement management program at the South St. Paul reliever airport. Pavement conditions are assessed using the Pavement Condition Index (PCI) procedure for airfield pavement. **Table 7-2** shows the PCI rating for all runways at each of the seven reliever airports.

Three runways at Crystal and St. Paul Downtown have at least some portion with a PCI of 40 or less, which will likely require reconstruction.

Table 7-2: Pavement Condition Ratings for Reliever Airport Runways

Airport Runway	Year of Condition Rating	Pci range
Anoka County/Blaine (ANE) Runway 09/27	2017	61-80
Anoka County/Blaine (ANE) Runway 18/36	2017	61-80
Flying cloud (FCM) Runway 10L/28R	2018	41-100
Flying cloud (FCM) Runway 10R/28L	2018	61-80
Airlake (LVN) Runway 12/30	2016	41-60
Crystal (mic) Runway 6L/24R	2018	61-80
Crystal (mic) Runway 14R/32L	2018	21-40
Crystal (mic) Runway 14L/32R	2018	81-100
St. Paul downtown (STP) Runway 14/32	2016	81-100
St. Paul downtown (STP) Runway 9/27	2016	61-100
St. Paul downtown (STP) Runway 13/31	2016	21-100
Lake Elmo (21d) Runway 14/32	2016	41-60
Lake Elmo (21d) Runway 4/22	2016	41-60
South St. Paul (SGS) Runway 16/34	2017	56-70

Of the 14 reliever runways, seven have PCI ratings of 60 or greater over the entire length of the runway (assuming the South St. Paul runway falls within this range), indicating that only preventative maintenance is needed. Five runways at Flying Cloud, Airlake, St. Paul Downtown, and Lake Elmo have runways where at least some portion has a rating between 40 and 60, which may require major rehabilitation. Three runways at Crystal and St. Paul Downtown have at least some portion with a PCI of 40 or less, which will likely require reconstruction.

Facility and Service 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 Regional) 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.

An integral part of system planning is the periodic review of the roles each airport serves in the system. The four airport role classifications are major, intermediate, minor, and special purpose.

The four airport role classifications are: Major, Intermediate, Minor, 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 service 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.

The Twin Cities regional airport system is a well-developed aviation system that has been properly managed and maintained.

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 2015 and 2016 for most of the system airports.

Each airport has mechanisms in place that provide for long-term planning of the airport facilities, use, and airspace.

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 percent of its proposed measures. The only proposed measure it failed to meet was the food service objective because of the lack of an airport restaurant.

Collectively, the Minor Airports meet nearly all of the proposed facility and service 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.

The Special Purpose Airports meet 100 percent 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.

Overall, the system airports meet 98 percent 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.

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 (FAA), 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.

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 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.

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 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 percent 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 2040 population projection for the metropolitan region, almost 80 percent of the population is expected to be within the service area of a system airport.

Nearly the entire metropolitan region is within the service area of a system airport, with 83 percent of the metropolitan region covered.

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 percent population coverage during the afternoon peak period. The general aviation airports—Intermediate, Minor, 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 percent of convenient ground travel time coverage to the 2040 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.

The general aviation airports cumulatively, along with coverage provided by MSP, provide 76 percent of convenient ground travel time coverage to the 2040 projected population of the region.

Operations

Annual Aircraft Operations

Airport activity levels are typically measured by total aircraft operations. An operation is either an arrival or a departure, and therefore one arrival and one departure represent two operations. Annual operations at MSP were obtained from the FAA Air Traffic Activity System (ATADS). Annual operations at the six MAC-owned reliever airports were obtained from MAC's Annual Report to the Legislature. For the four reliever airports with towers (ANE, MIC, FCM, and STP), aircraft operations are counted only while the towers at those airports are operational. It should be noted that these airports are open 24 hours per day, but the control towers are closed during late night and early morning hours. The aircraft operations totals therefore do not include operations that occurred while the towers were closed. At MAC airports where there is no air traffic control tower (LVN and 21D) the operations totals are estimates compiled by MAC. Operations reported for South St. Paul (SGS) represent a combination of FAA estimates and forecast data. No operations are reported for the Special Purpose airports (25D, 8Y4, and 09Y).

Table 7-3: Total Annual Aircraft Operations for MAC Airports (2015-2019)

Airport	2014	2015	2016	2017	2018	Percent Change (2014-2018)
Minneapolis – St. Paul (MSP)	412,586	404,612	413,279	416,213	407,476	-1.5%
Airlake (LVN)	35,662	42,341	36,818	31,346	33,178	-7%
Anoka County – Blaine (ANE)	79,589	89,708	80,845	76,721	68,157	-14%
Crystal (MIC)	44,229	39,569	36,967	42,308	41,117	-7%
Flying Cloud (FCM)	94,244	87,493	84,038	79,511	73,634	-22%
Lake Elmo (21D)	34,374	32,845	27,275	33,220	25,727	-25%
St. Paul Downtown (STP)	88,995	56,676	54,548	69,277	64,539	-27%
South St. Paul (SGS)	61,999	62,000	62,640	63,600	64,800	+5%
Total	**851,248**	**815,244**	**796,410**	**827,556**	**782,912**	**-12%**

Operations are classified as either Air Carrier, Air Taxi, General Aviation (GA), or Military. At MSP, commercial operations (Air Carrier and Air Taxi operations) make up approximately 96 percent of all operations. In 2018, GA operations at MSP accounted for 2.9 percent of all activity and military operations accounted for 0.7 percent of all activity, which is consistent with previous years.

On-Time Performance

The Office of Airline Information, Bureau of Transportation Statistics (BTS) tracks on-time performance for both arrivals and departures across all commercial airports in the U.S. **Table 7-4** shows the percentage of flights that arrived on-time at MSP for each year from 2015 through 2018. Within this data set, aircraft must be airborne enroute to their scheduled destination in order for them to be considered delayed; therefore, cancelled and/or diverted flights are not considered late in this system. A flight is considered on-time when it arrives less than 15 minutes after its published arrival time. Factors that can cause a flight to be delayed may be related to mechanical problems, lack of crew, weather, or airfield capacity constraints. As shown, MSP has operated above the national average every year since 2010.

Factors that can cause a flight to be delayed may be related to mechanical problems, lack of crew, weather, or airfield capacity constraints. MSP has operated above the national average every year since 2010.

Table 7-4: On-Time Performance for Arrivals at MSP (2015-2018)

Airport	2015	2016	2017	2018	2019
Minneapolis – St. Paul (MSP)	78.6	82.8	87.2	83.2	81.4
National Average	79.8	79.6	81.9	78.3	76.3

The BTS also tracks the percentage of flights that depart on time, defined as flights that depart within 15 minutes of their scheduled departure time. As shown in **Table 7-5**, MSP has operated above the national average every year since 2010 for this measure as well.

Table 7-5: On-Time Performance for Departures from MSP (2015-2019)

Airport	2015	2016	2017	2018	2019
Minneapolis – St. Paul (MSP)	79.7	83.9	87.8	84.0	82.6
National Average	81.0	81.0	82.4	79.2	77.3

Aircraft Delay per Operation

In additional to on-time performance, the FAA also tracks average delay per aircraft per operation (in minutes of delay). When calculating the average delay per aircraft operation, airport-attributable delay is estimated by comparing a flight's actual air and taxi times with estimated unconstrained times. The total cumulative amount of delay experienced by all scheduled flights in the database is then divided by the total number of flights in the database for the same time period. MAC reports this information in their Annual Report to the Legislature, ranking MSP against other large hub airports in the U.S. As shown in **Table 7-6**, with 4.6 minutes of delay per operation, MSP performed better than 24 other major hub airports in the U.S. in 2018.

MSP performed better than 24 other major hub airports in the U.S. in 2018.

Table 7-6: Average Delay Per Aircraft Operation at MSP In Minutes (2015-2018)

Measure	2015	2016	2017	2018
Average Delay per Aircraft Operation	4.3	4.6	4.0	4.6
Rank Among Large Hub Airports	25	14	17	10

Passenger Enplanements

In support of the FAA's Airport Improvement Program (AIP), the FAA maintains a database of revenue passenger boarding information in their Air Carrier Activity Information System (ACAIS). MAC reports that approximately 55 percent of all enplanements in 2018 were attributed to originating passengers, with the remaining 45 percent coming from connecting passengers. As shown in **Table 7-7**, enplanements at MSP are up 14 percent compared to 2010, which trends slightly above the U.S. total increase in enplanements during this time.

Enplanements at MSP are up 8 percent compared to 2015, which trends slightly the U.S. total increase in enplanements during this time.

Table 7-7: Total Annual Passenger Enplanements at MSP (2015-2019)

Airport	2015	2016	2017	2018	2019	Percent change (2015-2019)
MSP	18,274,733	18,765,403	19,002,544	19,007,719	19,783,380	+8%
US Total	712,025,632	724,158,444	731,800,470	738,935,380	761,288,443	+12%

Airline Cost per Enplaned Passenger

In order to track Congressionally mandated airport financial information, the FAA maintains a database of financial reports of some 520 commercial service airports in their Compliance Activity Tracking Systems (CATS). CATS financial information is standardized to allow for comparison across airports using the same methodology. As a result, CATS data differs from MAC-reported data for MSP in some cases. One key financial metric contained within the database is Airline Cost per Enplaned Passenger (CPE), which is a measure of the average passenger airline payments per enplaned passenger at a given airport. **Table 7-8** shows MAC-reported CPE data along with the average CPE for the 30 Large Hub airports in the U.S. from the CATS database. As shown, airlines operating out of MSP pay a lower rate per enplaned passenger compared to the large hub average, and the CPE percentage increase from 2015 to 2019 was less at MSP compared to the large hub average.

Airlines operating out of MSP pay a lower rate per enplaned passenger compared to the large hub average, and the CPE percentage increase from 2015 to 2019 was less at MSP compared to the large hub average.

Table 7-8: Airline Cost Per Enplaned Passenger at MSP (2015-2019)

Airport	2015	2016	2017	2018	2019	Percent change (2015-19)
MSP (MAC Data)	$6.03	$6.32	$6.42	$6.76	$6.81	+7%
MSP (CATS Data)	$5.71	$6.00	$6.50	$6.83	$6.60	+8%
Large Hub Average (CATS Data)	$10.74	$10.74	$10.91	$11.54	$12.05	+10%

Peer Region Comparison

To put the Twin Cities Regional Aviation System in perspective, a comparative analysis was conducted to provide insight into how other regional systems function when compared with MSP and its regional airport system. As part of the 2016 TSPE, six peer airport systems were identified for the comparative analysis with the Twin Cities Regional Airport System based on several factors using 2000 as the baseline year, including:

- Only one major hub airport serves the metropolitan area
- Low cost airline service was present at some time at the major hub airport
- The airports rank in the top 20 in terms of activity

Based on these criteria, the following peer regions were selected:

- Atlanta
- Charlotte
- Denver
- Detroit
- Philadelphia
- Pittsburgh

Since the year 2000, activity levels at Pittsburgh International Airport have steadily declined, and US Airways no longer uses Pittsburgh as a hub. Although Pittsburgh is no longer a large hub, it has been maintained as a peer airport for consistency across TSPE updates. All other cities continue to meet the screening criteria outlined above.

Annual Aircraft Operations

Table 7-9 summarizes total annual aircraft operations for 2015 through 2019 for MSP and the selected peer airports. Between 2015 and 2019, aircraft operations at MSP decreased by a similar percentage to the peer average; only Charlotte saw an increase in annual aircraft operations during this time. Despite the decrease in operations, Atlanta remains the world's busiest airport in 2015 in terms of annual aircraft operations.

Table 7-9: Annual Aircraft Operations for MSP and Peer Airports (2015-2019)

Airport	2015	2016	2017	2018	2019	Percent change (2015-19)
Atlanta (ATL)	950,119	923,991	930,098	911,074	868,359	-7%
Denver (DEN)	635,458	634,684	618,257	586,860	575,161	-14%
Charlotte (CLT)	529,107	539,842	552,515	557,955	545,294	+3%
Philadelphia (PHL)	460,779	448,129	443,236	432,884	419,253	-11%
Minneapolis – St. Paul (MSP)	435,583	435,076	424,928	431,573	411,760	-7%
Detroit (DTW)	452,616	443,028	427,814	425,732	392,635	-16%
Pittsburgh (PIT)	144,563	148,782	139,217	139,300	135,293	-2%
Peer Average	**515,461**	**510,505**	**505,152**	**497,911**	**478,251**	**-8%**

The operations reported in Table 7-9 include commercial service, general aviation, and military operations. With approximately 3.6 percent non-commercial operations, MSP ranks near the middle compared to the peer airports. Charlotte has the highest total number of annual general aviation and military operations, while Pittsburgh has the highest percentage of general aviation and military operations.

The two busiest peer airports in terms of operations (Atlanta and Denver) both have less than 1 percent of total operations from general aviation and military activity. 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.

The two busiest peer airports in terms of operations (Atlanta and Denver) both have less than 1 percent of total operations from general aviation and military activity. This helps support the need for reliever airports to accommodate additional general aviation operations within the Twin Cities Regional Aviation System.

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

Findings and Conclusions

Since 2010, MSP has experienced a steady increase in passenger enplanements, while maintaining cost-effective operations. The following findings and trends provide an overview of the aviation system from 2015 through 2019:

Since 2010, MSP has experienced a steady increase in passenger enplanements, while maintaining cost-effective operations.

- Total annual aircraft operations, including commercial and general aviation, decreased by approximately 7 percent between 2015 and 2019. At MSP, operations have decreased by 1.5 percent, and at the six MAC-owned airports, total operations have decreased by 15 percent. The decline in operations at MSP is consistent with the peer average over this time period (-8 percent)
- Although total operations have decreased, total annual passenger enplanements at MSP increased by 8 percent between 2015 and 2019. This increase tracks just below both the national (+12 percent).
- The reduction in total annual operations with an increase in total annual passenger enplanements is consistent with the airline industry trend to focus on productivity and use fewer flights with greater capacity (larger airplanes or simply putting more seats on existing airplanes) to serve major destinations
- The average cost per enplaned passenger at MSP increased by around 7 to 8 percent between 2015 and 2019, which is similar to the large hub average (+7 percent).
- On-time performance for both arrivals and departures at MSP fluctuates year to year, but MSP consistently performs above the national average for large hubs. MSP generally performs in the top half of the selected peer airports.
- Similarly, average delay per aircraft operations at MPS fluctuates year to year, but MSP consistently performs very well compared to the average for large hub airports. While MSP achieved the least amount of delay per aircraft operation in 2016 over this time period, 2015 was MSP's best year relative to other large airports.

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