

The Madison Area Transportation System

Performance Measures Report 2016



November 2017



Madison Area Transportation Planning Board

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The contents of this report do not necessarily reflect the official views or policy of the U.S. Department of Transportation or WisDOT.

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Regional Transportation Plan Goals and Measures

Goal I: Create Connected Livable Neighborhoods and Communities

- Miles of Pedestrian Facilities
- Miles of Bike Facilities
- BCycle Utilization

Goal II: Improve Public Health, Safety, and Security

- **Motor Vehicle Crash Fatalities**
 - **5-year average # of fatalities**
 - **5-year average rate of vehicle fatalities**
- **Motor Vehicle Series Injuries**
 - **5-year rolling average # of injuries**
 - **5-year average rate of vehicle injuries**
- **Pedestrian and Bicycle Fatalities and Serious Injuries**
 - **5-year rolling average # of non-motorized fatalities and serious injuries**

Goal III: Support Personal Prosperity and Enhance the Regional Economy

- Airline Passenger Traffic
- Housing + Transportation Costs
- Transit Access to Employment

Goal IV: Improve Equity for Users of the Transportation System

- Transit Ridership
- Specialized Transit Ridership
- Fixed Route Transit Service Area
- Transit Coverage for Minorities and Low Income Persons

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- Vehicle Miles Traveled
- Mode of Transportation to Work
- Air Quality

Goal VI: Advance System-wide Efficiency, Reliability, and Integration Across Modes

- Transit On-time Performance
- Percent of Key Destinations Served by Transit
- **Roadway Congestion and Reliability**
 - Congestion of NHS Routes
 - Reliability of NHS Routes
 - ***Percent of miles Traveled on the Interstate that are Reliable***
 - ***Percent of miles Traveled on Non-Interstate NHS that are Reliable***
 - ***Truck Travel Time Reliability (TTTR) Index***

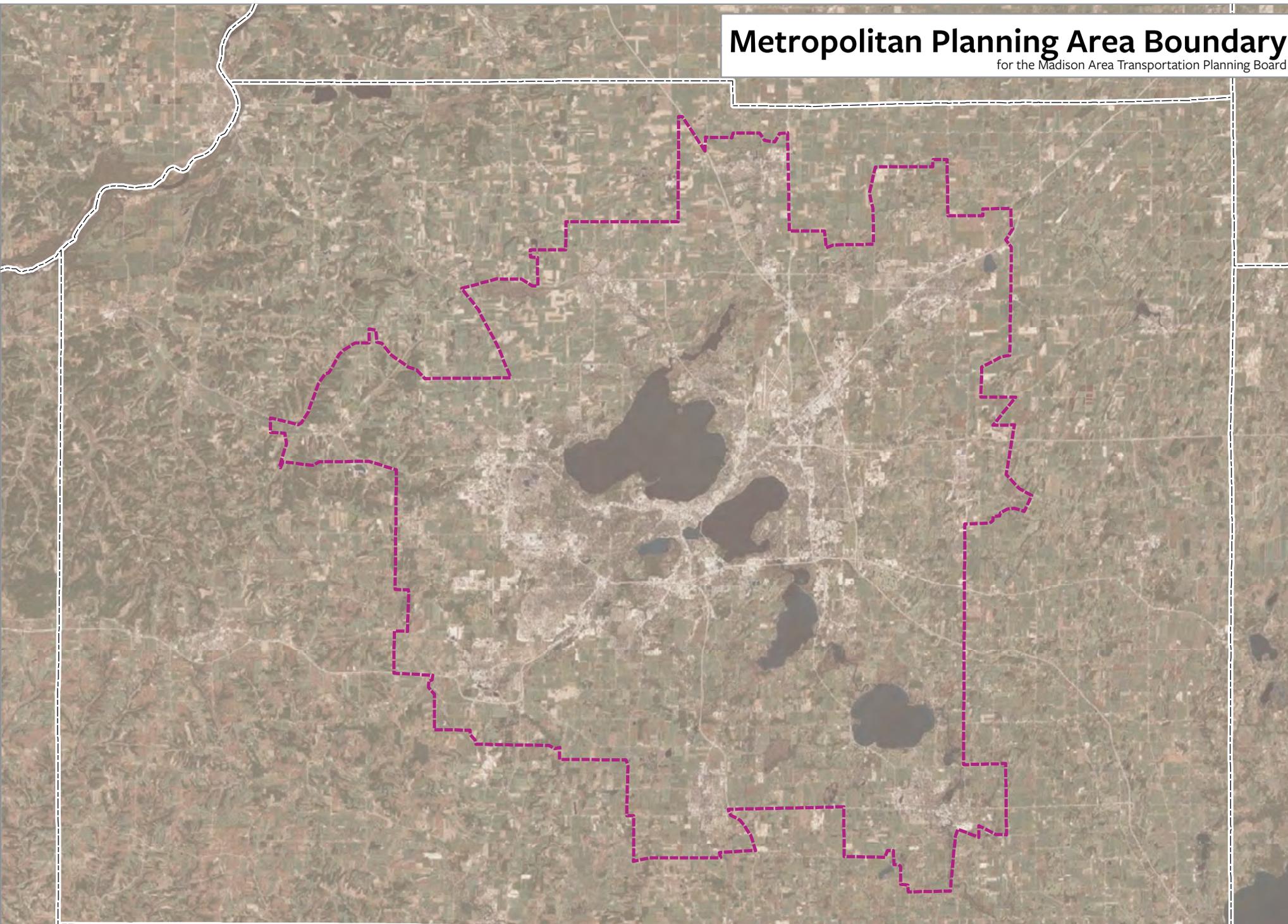
Goal VII: Establish Financial Viability of the Transportation System

- **Buses at or Past Replacement Age**
- **Bridge Condition**
 - **Percentage of NHS Bridges Classified as in Good Condition**
 - **Percentage of NHS Bridges Classified as in Poor Condition**
 - Bridge Condition of Non-NHS Bridges
- **Pavement Condition**
 - **Percentage of Pavements on the Interstate System in Good Condition**
 - **Percentage of Pavements on the Interstate System in Poor Condition**
 - **Percentage of Pavements on the non-Interstate NHS in Good Condition**
 - **Percentage of Pavements on the non-Interstate NHS in Poor Condition**

Bold measures are federally required. *Italicized measures* are not in current report.

Metropolitan Planning Area Boundary

for the Madison Area Transportation Planning Board



Legend

-  County Boundary
-  MPA Boundary

Source Information: DCLIO, US Census, ESRI



Introduction

Purpose

The Madison Area Transportation Planning Board (MATPB), the Metropolitan Planning Organization (MPO) for the Madison area, creates and maintains the Regional Transportation Plan (RTP) for the Madison Metropolitan Area. The RTP articulates the long-range transportation vision for the region and provides numerous policies and recommends key investments to meet both [regional](#) and [national](#) goals. The seven goals identified in the RTP serve as the framework for the Performance Measures Report (PMR). The purpose of the report is to gauge progress in achieving the RTP goals, inform decisions about investments and strategies, and provide an annual snapshot of how well the regional transportation system is performing over time. Further, the PMR helps the MPO meet [federal requirements for performance management](#) outlined in the [Fixing America's Surface Transportation \(FAST\) Act](#). Some measures are applicable to more than one goal, but have been organized under the goal that fits best. Some aspects of the plan goals are not addressed by the measures due to unavailable or incomplete data. In some cases, methodologies for the measures may change, such as when guidance is finalized for the new federally required measures.

In this report, state targets have been reported for the safety performance measures. State department of transportations (DOTs) are required to establish performance targets for federally mandated performance measures. MPOs may either support the DOT's targets or establish their own.

Measures and Methodology Updates

The measures in this report are not intended to be exhaustive, but rather allow tracking of meaningful progress towards goals for which accurate, easily obtainable data is available. The 2016 PMR contains a number of changes to measures and methodologies including:

- Miles of Pedestrian Facilities – collection methodology changed to avoid double counting mileage on some streets
- Miles of Bike Facilities – rebaselined due to a database update to include facilities missed in last report
- All Safety Measures – Federal Fatality Analysis Report System (FARS) database now used in accordance with federal rule
- Bridge Condition – methodology changed to align with required federal performance measure
- Active Living Index Score removed due to difficulty of replication
- Freight Exports and Imports removed due to difficulty in obtaining consistent data

Additionally, a new general change threshold of +/- 1% or within the margin of error (MOE) of the data is now being used to determine the trend of a measure. Year-over-year change of less than 1% or the MOE will be reported as “steady.”

Report Findings

This is the second year that the PMR has been published. The following are notable trends:

Positive Trends

- Major increase in airline passenger traffic
- Slight increase in specialized transportation ridership
- Maintaining fixed-route transit serve area
- Maintaining transit on-time performance

Negative Trends

- Slight decrease in accessibility to jobs using transit
- Major decline in transit ridership in 2016, yielding a total decline of 14% since 2014
- Increase in percent of residents driving to work alone
- Maintaining rather than improving air quality levels
- Maintaining rather than improving levels of roadway congestion and reliability



Create Connected Livable Neighborhoods and Communities

Create interconnected livable places linked to jobs, services, schools, shops, and parks through a multi-modal transportation system that is integrated with the built environment and supports compact development patterns that increase the viability of walking, bicycling, and transit.

Create Connected Livable Neighborhoods and Communities

Miles of Pedestrian Facilities

Walking is the second most common mode of transportation, and pedestrian facilities—sidewalks, crosswalks, and off-street paths—are a cornerstone of the transportation network. These facilities make walking safer and more comfortable and form critical links between transit stops and destinations. As the only transportation facilities that can be used by all without charge and without vehicles or special equipment, they are especially valuable to children, seniors, the disabled, and the poor.

The Madison metropolitan area currently has 1,135 roadway miles with sidewalk, 77% of which have sidewalk on both sides of the road. The majority of these sidewalks (56%) are located in the City of Madison. In addition to sidewalks, there are 128 miles of pedestrian paths and hiking trails and 237 miles of shared-use paths that may be used by pedestrians in the metropolitan area. While pedestrian facility mileage in the area continues to increase as new sidewalks are built as part of new development and the path and sidewalk systems continue to expand in previously developed areas, it is not possible to assess the change in pedestrian facility mileage within the past year due to changes in measurement methodology. Thus, 2016 will be considered a baseline year and additions to the regional pedestrian facility network will be measured going forward.

DESIRED TREND

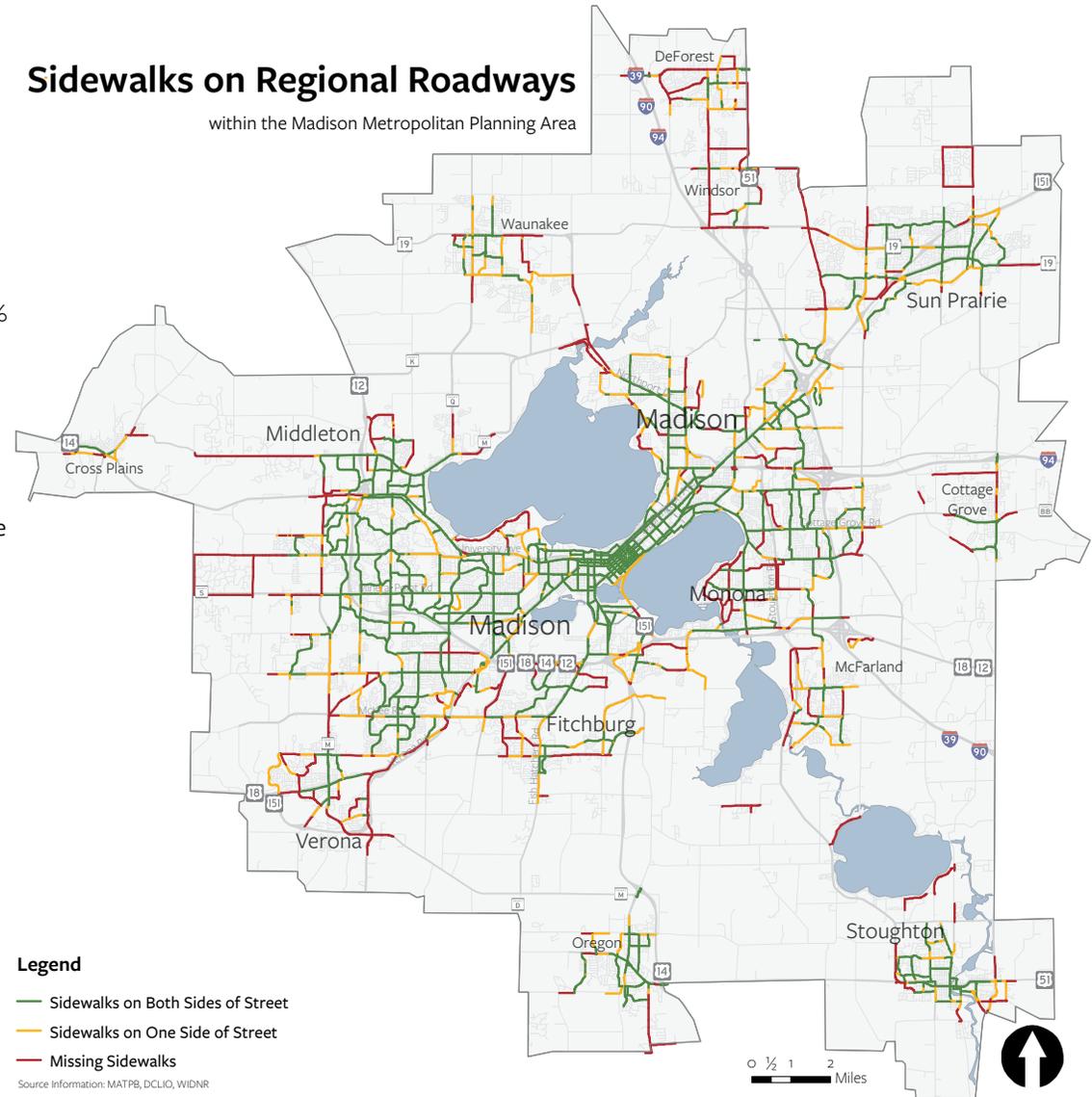


ACTUAL TREND



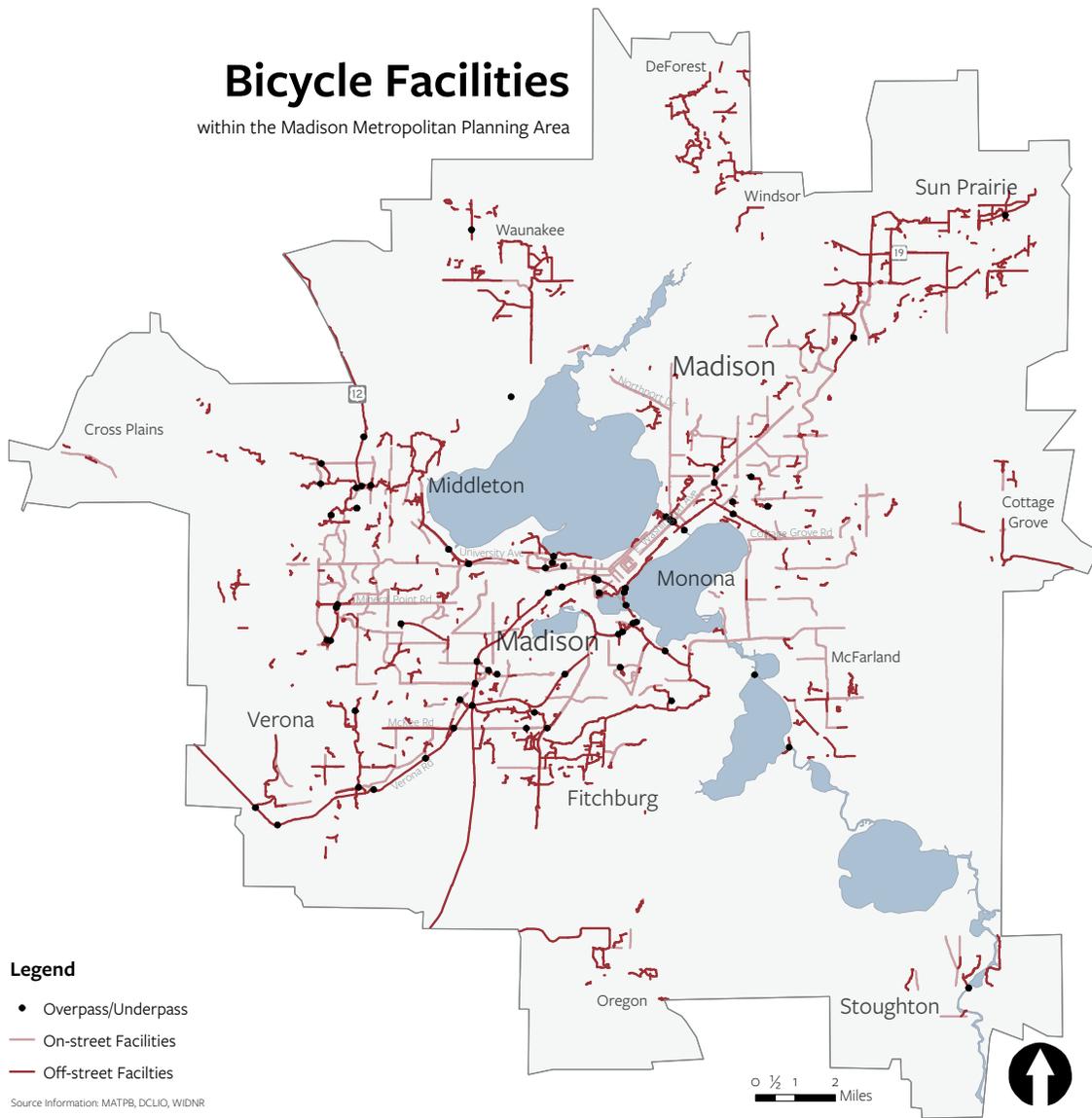
Sidewalks on Regional Roadways

within the Madison Metropolitan Planning Area



Bicycle Facilities

within the Madison Metropolitan Planning Area



Legend

- Overpass/Underpass
- On-street Facilities
- Off-street Facilities

Source Information: MATPB, DCLIO, WIDNR

Miles of Bicycle Facilities

The Madison metropolitan area is among the most bicycle-friendly places in the U.S. The League of American Bicyclists has recognized the cities of Madison (platinum), Fitchburg (silver), Middleton (bronze), and Monona (bronze) for their bicycle networks and promotion activities.

A number of significant bicycle facilities were added during 2016, including several that filled or addressed identified gaps or barriers in the bikeway network and/or that were identified as priority regional paths. Completed projects include:

- Ice Age Junction Path between Mineral Point Rd. and Tree Ln.. (C. Madison)
- New bike lanes on Cottage Grove Rd. from Monona Dr. to Dempsey Rd. and buffered bike lanes from USH 51 to Acewood Blvd. (C. Madison)
- New bike lanes on Mendota St. between E. Washington Ave. and Walsh Rd. (C. Madison)
- New path along CTH C between Windsor St. and St. Albert the Great Dr (C. Sun Prairie)
- New bike lanes and path along Northern Lights Rd. between CTH PD and Cross Country Rd. (C. Verona)
- New path along Woodland Dr. between CTH M and Mary Lake Rd. (T. Westport)
- Small segment of the planned Lower Yahara River Trail south of McDaniel Park (V. McFarland)
- New bike lanes on Siggelkow Rd. east of Marsh Rd. (V. McFarland)

The metropolitan area bicycle network, which continues to expand, consists of 176 miles of on-street facilities and 272 miles of off-street facilities. 2016 is a baseline year due to data and methodology changes.

DESIRED TREND



ACTUAL TREND



Bicycle Facilities in 2016

116 miles on-street in Madison

176 miles on-street in Metro Area

86 miles off-street in Madison

272 miles off-street in Metro Area

BCycle Utilization

BCycle, Madison's bike-share system, provides bicycles that can be checked out for short trips from about 40 stations in the Madison area, extending from Whitney Way, in the west, to the Madison College Truax campus, in the east, with the highest density of stations in the downtown area. All of the stations are easily accessible from the City's expansive network of bike lanes and paths.

In 2016, system utilization was virtually unchanged from the previous year, after having grown rapidly during the system's first five years of operation. Construction activities in Madison, which necessitated the closure of three downtown stations, may have dampened growth during the year. There were, however, two temporary stations in operation during 2016, at the Edgewater Hotel (1001 Wisconsin Place) and at the Madison BCycle office (312 N. Third Street).

DESIRED TREND



ACTUAL TREND



BCycle in the Madison Metro Area

Year	Trips	Members	Miles Biked	Avg Trip in Miles	Stations	Pop Served
2011*	18,501	475	39,618	2.14	27	39,664
2012	63,325	2,150	94,402	1.49	35	42,862
2013	81,662	1,843	173,940	2.13	35	42,862
2014	104,274	2,622	219,108	2.10	39	45,091
2015	101,339	2,789	307,241	3.03	40	45,465
2016	100,938	2,555	307,992	3.05	39	45,995

*Partial year of data. Service Launched in June 2011.





Improve Public Health, Safety, and Security
Design, build, operate, and maintain a transportation system that enables people to get where they need to go safely and that, combined with supportive land use patterns and site design, facilitates and encourages active lifestyles while improving air quality.

Improve Public Health, Safety, and Security

Federal Requirements

Improving safety is a top priority and is at the heart of many transportation investment decisions. In early 2016 the Federal Highway Administration (FHWA) released new rules establishing safety performance measures to track progress in achieving a reduction in fatalities and serious injuries on all public roads. State DOT's are required to establish safety performance targets in 2017 for the five identified safety measures. MPO's may either support the State's targets or establish their own.

Crash Reduction Targets for Wisconsin

WisDOT has set the following statewide safety targets for the 2018 reporting period:

- Number of Fatalities: Reduce by 2% (556 fatalities or less)
- Rate of Fatalities: Reduce by 2% (a rate of .917 or less)
- Number of Serious Injuries: Reduce by 5% (3,023 serious injuries or less)
- Rate of Serious Injuries: Reduce by 5% (a rate of 4.997 or less)
- Number of Non-Motorized Fatalities and Serious Injuries: Reduce by 5% (343 fatal and serious injuries or less)

Five-year average crash data from 2012-2016 will serve as the baseline to measure progress during the 2013-2017 period towards achieving the crash reduction targets for the report required in 2018.

Motor Vehicle Crash Fatalities

Dane County experienced an average of 34 fatalities per year as a result of an automobile collision for the 5-year period from 2012-2016. Within this period the county experienced a record low number of fatalities in 2014, however the 2016 fatality data shows the highest number of fatalities since 2008.

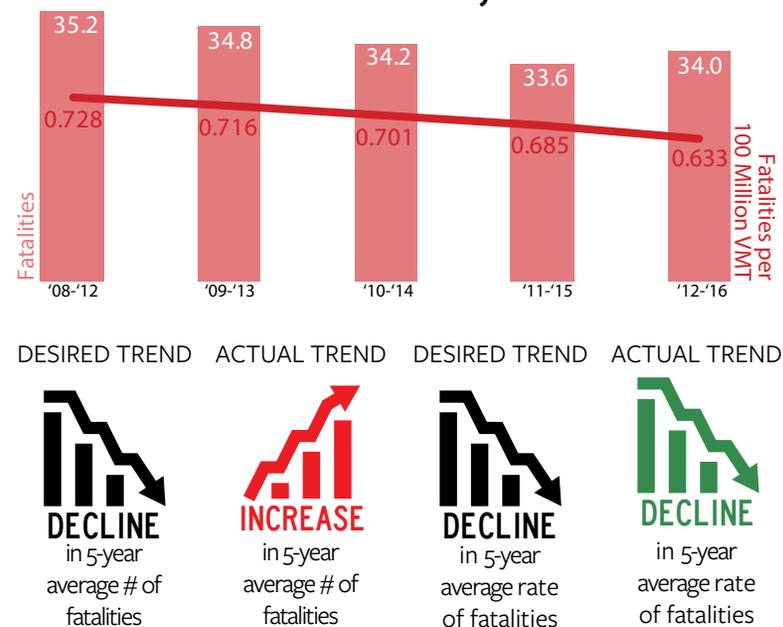
Crash rates help explain the relative safety of the system, allowing for locations with differing characteristics (including the amount of traffic) to be compared against other locations. Crash rates are calculated by factoring the number of crashes by the amount of vehicle miles traveled (VMT). In the 5-year reporting period there was little variance between the annual fatality rates, despite the fact that VMT exhibited an overall growth trend during this same time. This indicates that even though more people were using the roadways, a decreasing percentage of those users were involved in a fatal crash. The 5-year fatality rate for Dane County was 0.663.

Rolling averages smooth out the year-to-year fluctuations in the number of crashes that can occur due to the randomness of crash events that can skew the data in a particular year, allowing for an examination of trends over time. To develop the averages, counts and rates are added for a series of years and averaged for the time period. Both the number of fatalities and the fatality rate show a general downward trend over time. The number of fatalities did see a slight increase for the 2012-2016 period, an increase of 1.2% over the 2011-2015 period, thus failing to meet the state target of a 2% reduction. The crash fatality rate for the 2012-2016 period decreased by 3.3% from the 2011-2015 period, meeting the state goal of a 2% reduction. The Dane County fatality rate is already significantly lower than the statewide rate.

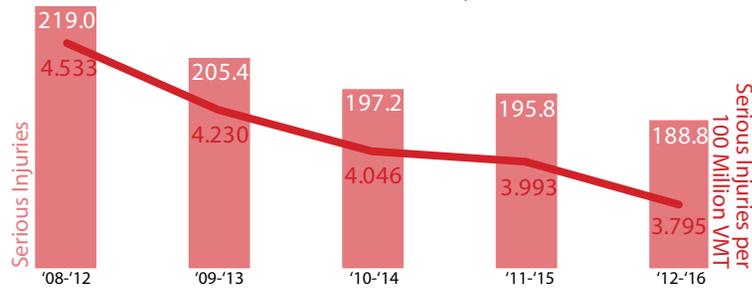
Dane County Annual Motorized and Nonmotorized Fatalities and Serious Injuries

	2012	2013	2014	2015	2016
Vehicular Fatalities	33	35	30	34	38
Vehicular Serious Injuries	178	196	175	207	188
Non-Motorized Fatalities	4	6	3	6	9
Non-Motorized Serious Injuries	39	26	18	34	30

Dane County Motor Vehicle Fatalities and Rates 5-Year Averages



Dane County Motor Vehicle Serious Injuries and Rates 5-Year Averages



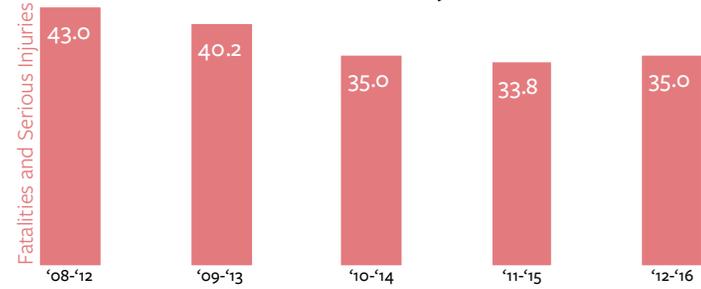
DESIRED TREND ACTUAL TREND



DESIRED TREND ACTUAL TREND



Dane County Non-Motorized Combined Fatalities & Serious Injuries 5-Year Averages



DESIRED TREND ACTUAL TREND



Motor Vehicle Serious Injuries

Serious, or incapacitating, injuries are classified as any injury other than a fatal injury which prevents the injured person from walking, driving, or from performing other activities which they performed before the accident.

Dane County experienced an average of 189 serious injuries per year from 2012-2016. The number of serious injuries annually ranged from a low of 175 injuries in 2014 to a high of 207 injuries in 2015.

The annual serious injury rate closely mirrors the number of serious injury trend. The five-year serious injury rate for Dane County is 3.795.

The five year rolling average for serious injuries shows a steady decrease over time, both in terms of the number of serious injuries and the rate of serious injuries. The number of serious injuries decreased by 3.7% from the 2011-2015 period and the rate of serious injuries decreased by 5.2%. The state targets represent a 5% reduction. The Dane County serious injury rate is already significantly lower than the statewide rate.

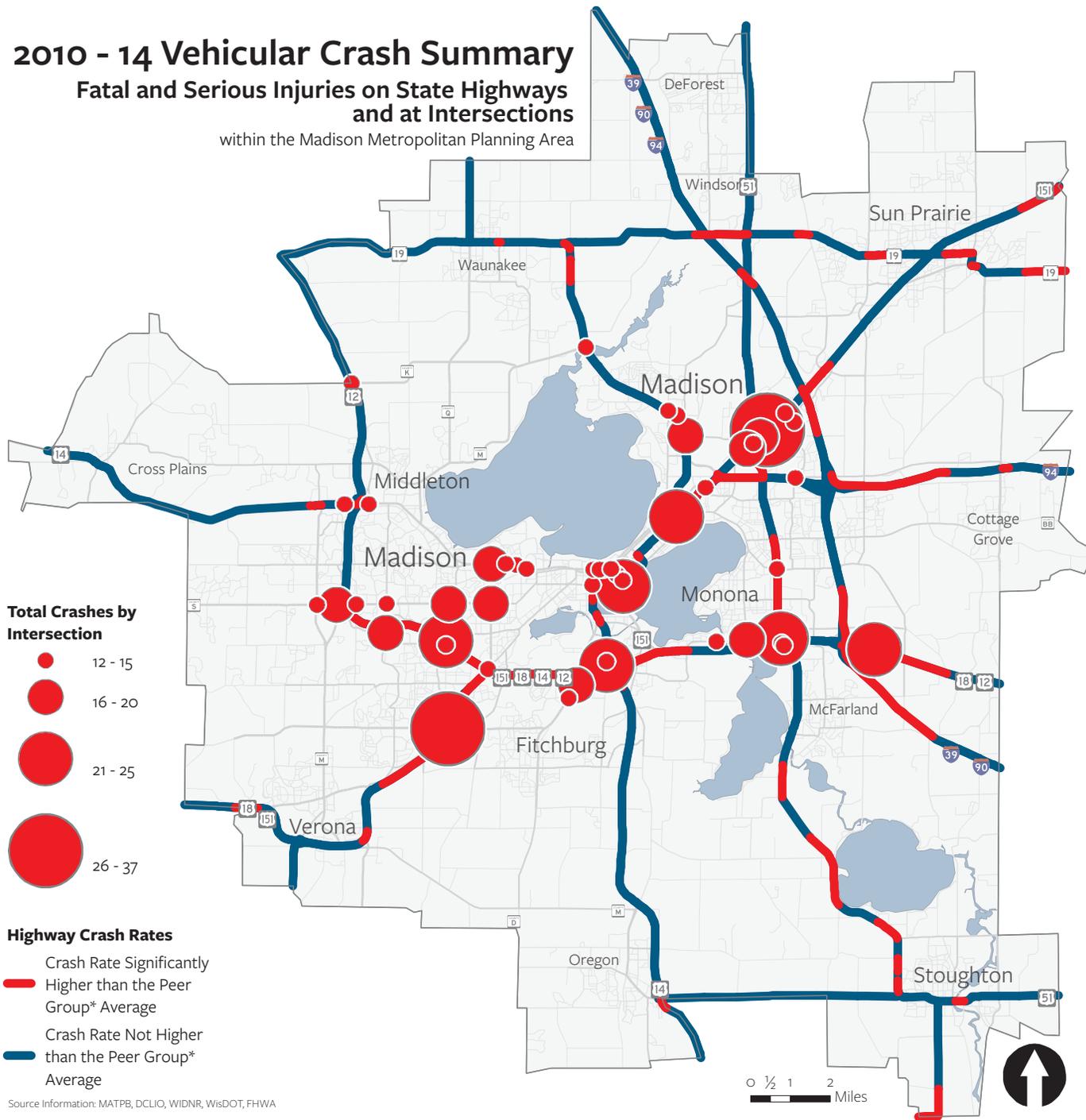
Non-Motorized Fatalities and Serious Injuries

Pedestrian and bicyclist deaths and injuries had been in decline in recent years, however they increased in 2015, and in 2016 Dane County experienced the highest number of non-motorized fatalities since 2009. The average combined number of non-motorized fatalities and serious injuries for the 2012-2016 period increased 3.4% over the 2011-2015 period. The state target represents a 5% reduction, which was not met given the increase.

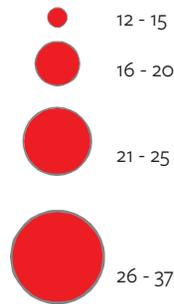
2010 - 14 Vehicular Crash Summary

Fatal and Serious Injuries on State Highways and at Intersections

within the Madison Metropolitan Planning Area



Total Crashes by Intersection



Highway Crash Rates

- Crash Rate Significantly Higher than the Peer Group* Average
- Crash Rate Not Higher than the Peer Group* Average

Source Information: MATPB, DCLIO, WIDNR, WisDOT, FHWA



Support Personal Prosperity and Enhance the Regional Economy

Build, operate, and maintain a transportation system that provides people with affordable access to jobs and enables the exchange of goods and services within the region and to/from other regions.

Support Personal Prosperity and Enhance the Regional Economy

Airline Passenger Traffic

Airline passenger traffic can be used to monitor business success as well as personal financial well-being. Some flights are bound for the area as a tourist destination, injecting money directly into the local economy. Each flight requires a trip to and/or from the airport, meaning that the success of the airport is tied to the quality and reliability of the greater transportation network.

Arrivals and departures fell at the Dane County Regional Airport (MSN) during the recession; however, arrivals and departures have increased each year since 2012, setting a record high in 2016, an increase of 9.8% over 2015. According to an airport press release, the increase can be attributed to the strong local economy and the additional routes and larger aircraft offered by the airlines that serve MSN, which will in turn help to continue to expand the options available to passengers. MSN provides non-stop service to Atlanta, Charlotte, Chicago, Dallas-Fort Worth, Denver, Detroit, Minneapolis, New York, Newark, Orlando, Salt Lake City, and Washington D.C., with more than 90 arrivals and departures daily.

DESIRED TREND



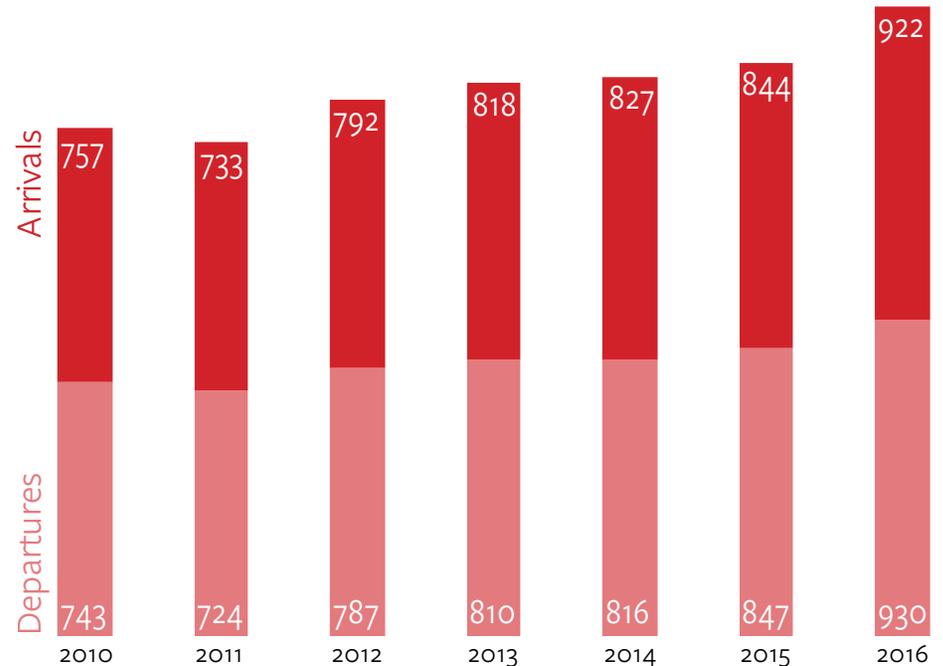
INCREASE
in
passengers

ACTUAL TREND



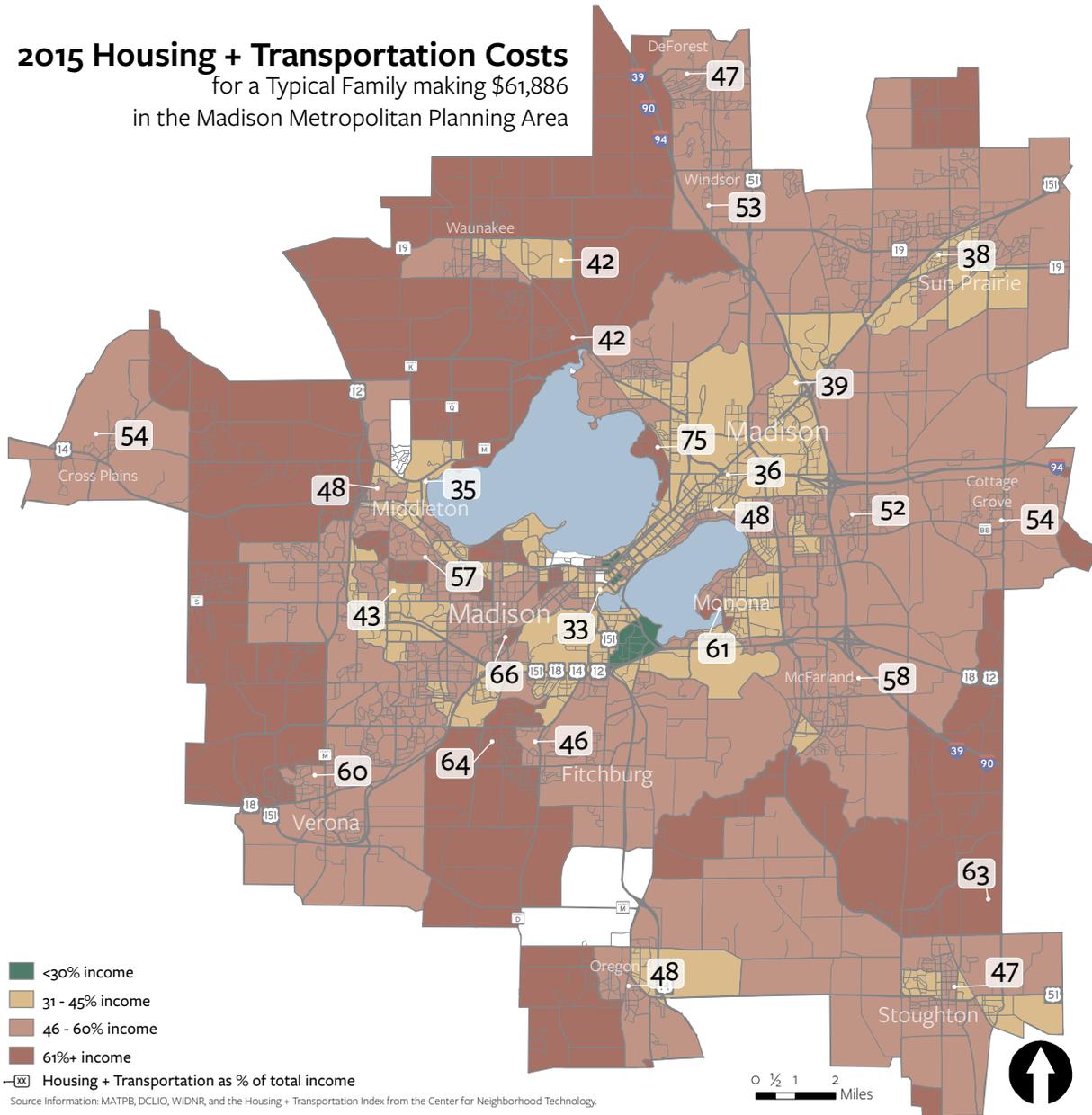
INCREASE
in
passengers

Dane County Regional Airport (MSN) Annual Passenger Volume (in thousands)



Source: Dane County Regional Airport Monthly Activity Report

2015 Housing + Transportation Costs for a Typical Family making \$61,886 in the Madison Metropolitan Planning Area



■ <30% income
■ 31 - 45% income
■ 46 - 60% income
■ 61%+ income
 (xx) Housing + Transportation as % of total income

Source Information: MATPB, DCLIO, WIDNR, and the Housing + Transportation Index from the Center for Neighborhood Technology.

Housing + Transportation Costs

Affordable housing has traditionally been defined as accounting for no more than 30% of household income. However, this neglects to account for the way that housing location affects most families' second biggest expense, transportation. The [Housing + Transportation \(H+T\) Index tool](#), created by the Center for Neighborhood Technology (CNT), provides a more holistic view of affordability by using data on the average costs of housing and transportation, along with demographic and travel information, to assess neighborhood affordability relative to median household income. 45% of household income is the recommended threshold for affordability when housing and transportation costs are combined.

According to CNT's most recent analysis, based on 2015 data, the typical Dane County household has 2.4 people and 1.2 workers; makes nearly \$62,000 per year, and spends about \$13,000 per year on transportation and \$19,000 on housing. As shown in the transportation index map on page 13, only in a handful of neighborhoods would a median income household be expected to spend 15% or less of their income on transportation. Relatively low transportation costs shouldered by households in these areas is explained by lower rates of car ownership, fewer miles driven, and higher rates of transit usage. The highest transportation costs are in mostly rural areas with no transit service, where residents drive long distances to reach jobs and attend to their day-to-day needs.

As shown in the housing index map on page 13, housing costs are much more geographically mixed than transportation costs. While some of the highest and lowest cost neighborhoods are located near the urban core, housing costs vary widely across the metropolitan area. While the neighborhoods with the lowest combined housing and transportation costs are located near the center of the metropolitan area, there are a variety of neighborhoods in the area with combined housing and transportation costs below the 45% threshold. These neighborhoods share a close proximity to jobs and services, and many also have good access to transit.

The population-weighted average H+T score in the metropolitan area declined slightly from 50.6% in 2013 to 49.3% in 2015 and was likely driven by the increase in income more than any other factor. However, these changes are not likely not statistically significant.

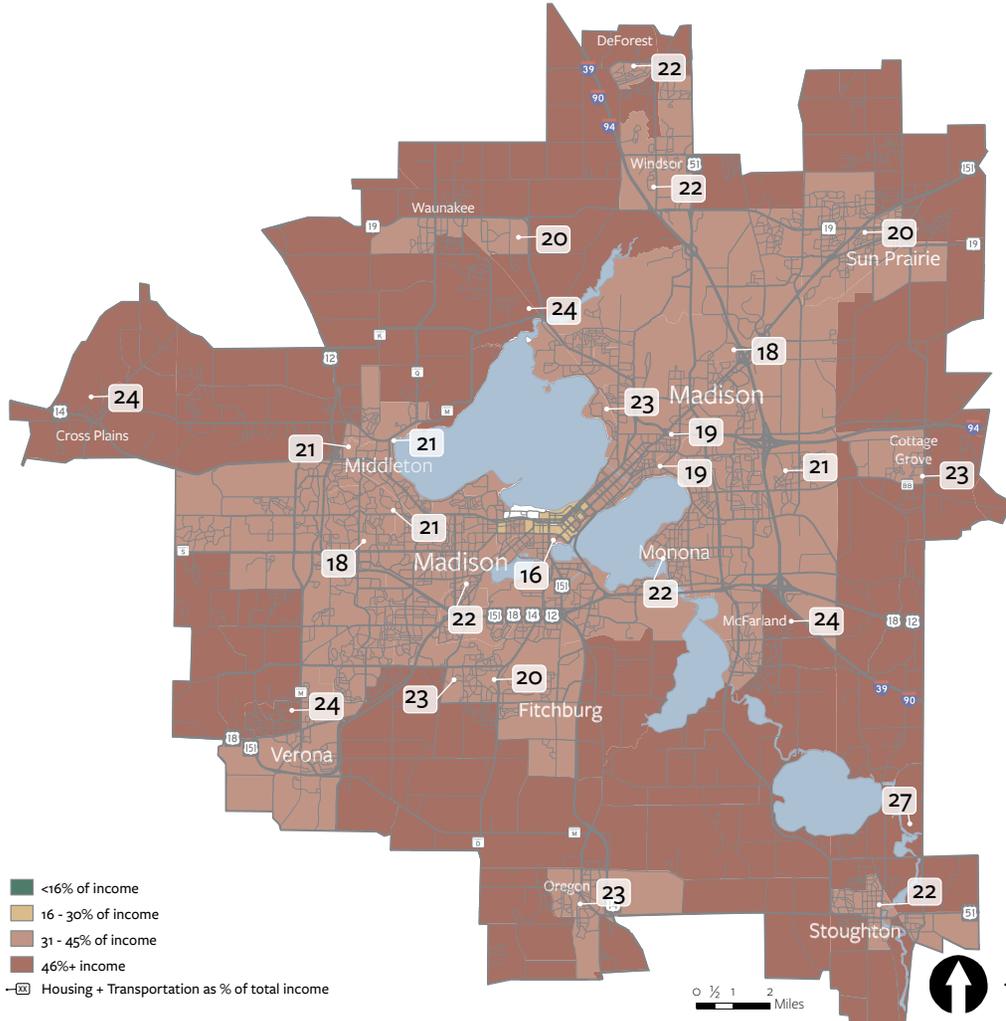
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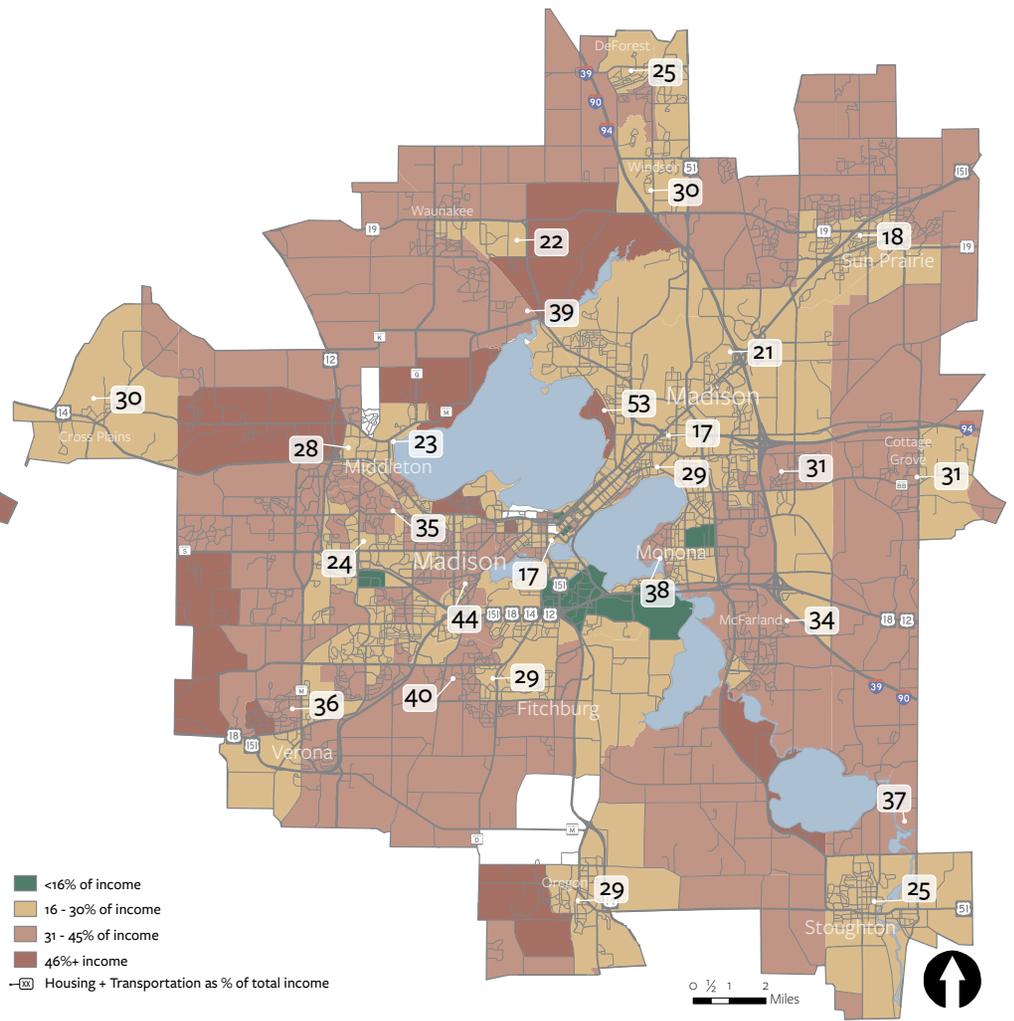
ACTUAL TREND



Regional Affordability for a Typical Dane County Family making \$61,886



Transportation Costs

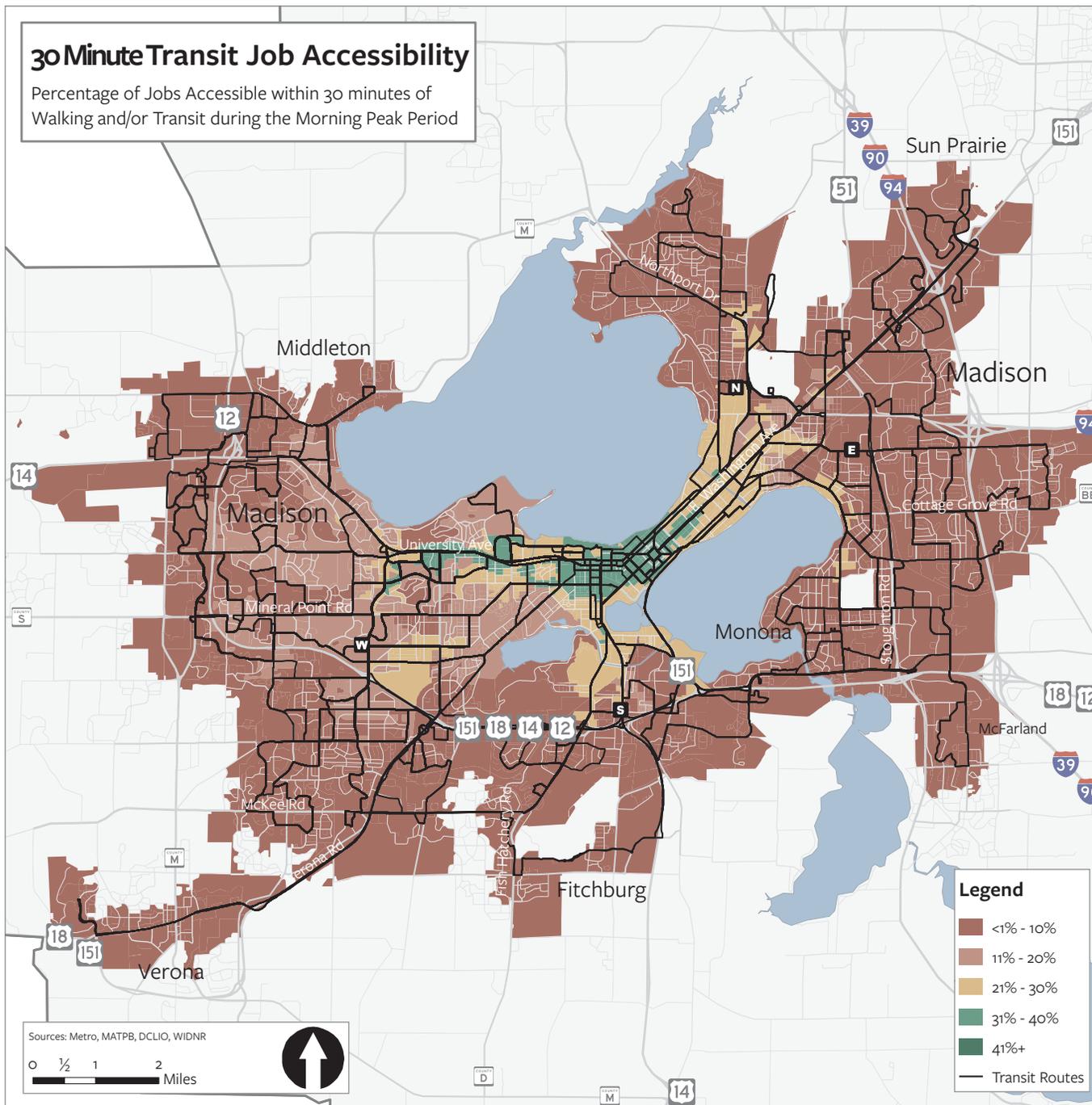


Housing Costs

Source Information: MATPB, DCLIO, WIDNR, and the Housing + Transportation Index from the Center for Neighborhood Technology.

30 Minute Transit Job Accessibility

Percentage of Jobs Accessible within 30 minutes of Walking and/or Transit during the Morning Peak Period



Transit Access to Employment

According to US Census data, more than 6% of commuters in the Madison Metropolitan Area use public transportation to get to work. Most bus service in the Madison area is provided by Metro Transit, a City of Madison-owned transit system with service extending into several other communities. Public transit gives people an alternative to driving that conserves fuel and reduces emissions.

The Transit Job Accessibility maps show the percentage of jobs in the Madison Urban Area that a person residing within each Census Block can access within 30 minutes and 45 minutes by walking and/or using public transit. In the Madison area, a commute of 30 minutes or less is normal and many would likely consider a 45-minute commute tolerable. Longer commutes can be made, but are not competitive with driving or other modes.

Residents in central Madison can access more jobs in the region than people living around the periphery for several reasons. First, central Madison is in the middle of Metro Transit's service area, allowing them to travel in all directions to access jobs. Second, service levels are higher in central Madison with more frequent service and more routes available. Third, jobs are regionally concentrated around the University of Wisconsin campus and Capitol Square.

Commuters using transit in the Madison Metropolitan Area have longer commutes on average than those using other modes while covering shorter distances. The average Madison area transit commuter is estimated to spend about 33 minutes getting to work, compared with about 20 minutes for other modes.

Our analysis finds that 51,944 people or 12% of the metropolitan area population can access 50% or more of the jobs within 45 minutes. This is a slight decrease from 52,750 people in 2015. This was likely caused by route restructuring in August 2016 that simplified routes in an effort to make them more reliable and easier to understand. While accessibility decreased slightly, the result was likely a net-positive for the overall transit service.

Source: MATPB - 2015 Roadway Centerlines, Metro Transit - 2015 routes/stop locations, InfoUSA - 2010 employment locations. Areas in white are not served by transit.

DESIRED TREND



ACTUAL TREND



Transit Job Accessibility

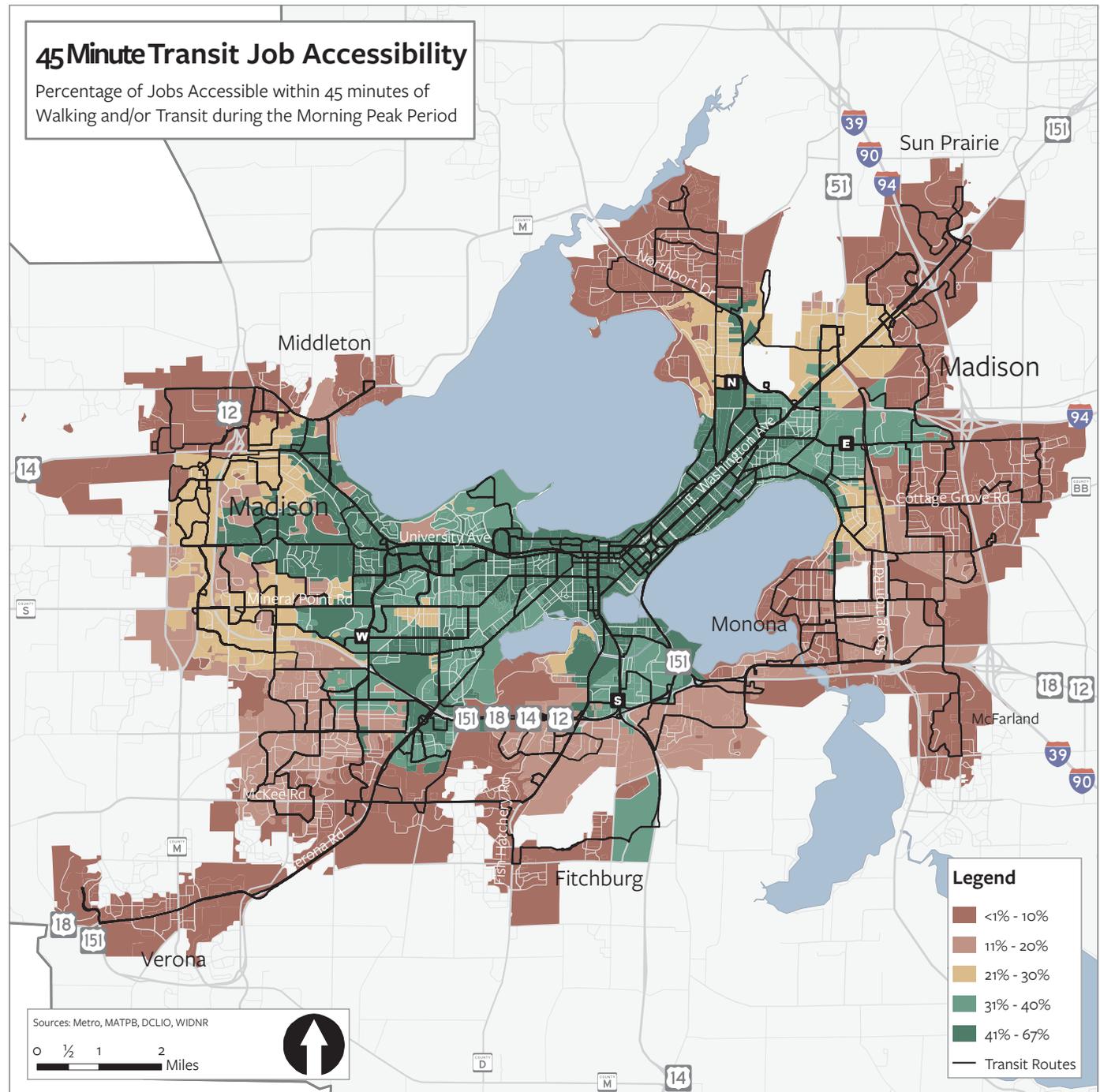
% of Jobs accessible via transit

of people able to access jobs within 30 Minutes 45 Minutes

% of Jobs accessible via transit	30 Minutes	45 Minutes
50% or more	N/A	51,944
40% or more	N/A	94,417
30% or more	36,145	129,148
20% or more	72,389	152,990
10% or more	111,825	201,072
Less than 10%	275,019	275,019

45 Minute Transit Job Accessibility

Percentage of Jobs Accessible within 45 minutes of Walking and/or Transit during the Morning Peak Period



Sources: Metro, MATPB, DCLIQ, WIDNR



Legend

- <1% - 10%
- 11% - 20%
- 21% - 30%
- 31% - 40%
- 41% - 67%
- Transit Routes

Source: MATPB - 2015 Roadway Centerlines, Metro Transit - 2015 routes/stop locations, InfoUSA - 2010 employment locations. Areas in white are not served by transit.



Improve Equity for Users of the Transportation System

Provide an equitable level of transportation facilities and services for all regardless of age, ability, race, ethnicity, or income.

Improve Equity for Users of the Transportation System

Transit Ridership

Efficient and well-used public transit service is a key component of a well-balanced transportation system that serves all users. Two transit systems operate fixed-route bus service – Madison Metro Transit and Monona Transit – in the Madison Urban Area.

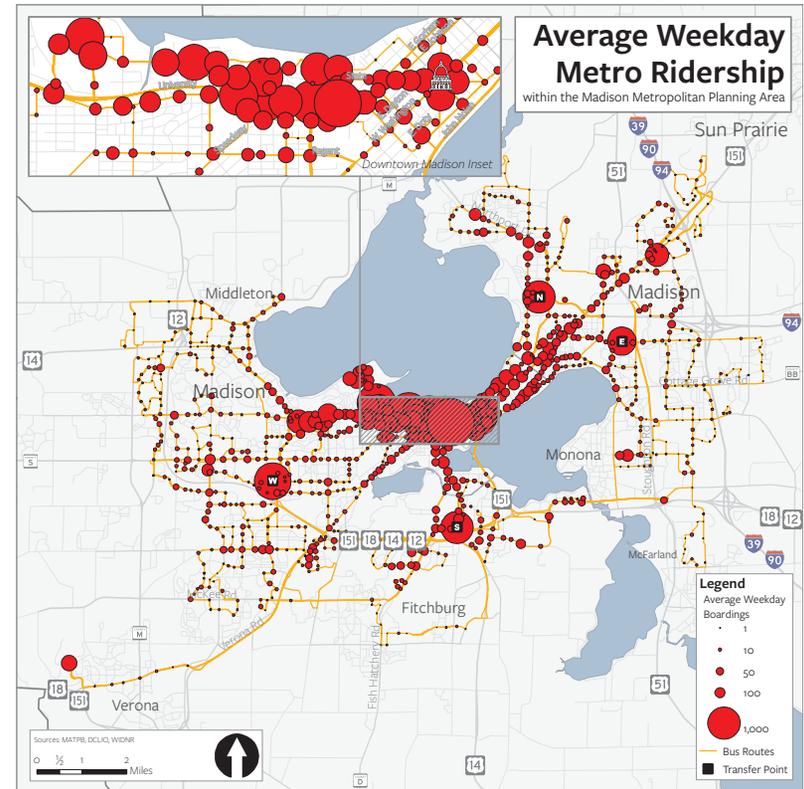
Metro Transit, serving Madison as well as neighboring partner communities, including Middleton, Fitchburg, and Verona, had seen increasing fixed-route ridership nearly every year between 1990 and 2014; however, ridership has been falling since 2015. The drop in ridership follows national trends that are not completely understood. Researchers have hypothesized that ridership declines nationally could be attributed to a number of things:

- A stronger economy
- Gas prices that have been below \$2.50 since September 2015 and below \$3.00 since early 2014
- Ridesharing services that provide faster door-to-door service
- Improved bicycling infrastructure leading to change of modes
- Inadequate funding leading to insufficient service in key areas
- Transit service that is too slow and/or unreliable
- Static or increasing fare prices as other options get cheaper
- Increases in urban density that put more trips within walking or biking distance
- Favorable weather providing would-be riders the choice to walk or bike during more months of the year

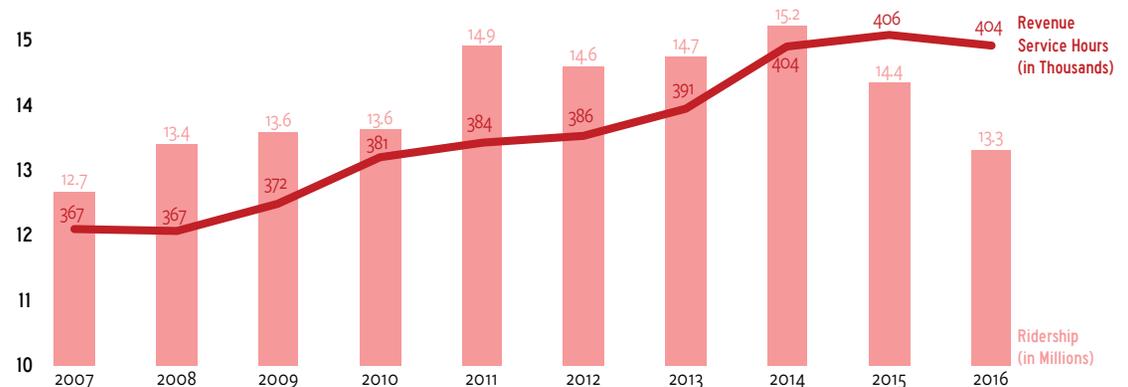
The downward trend in overall ridership has been observed for two straight years - with ridership dropping nearly 6% between 2014 and 2015 and another 7% between 2015 and 2016. While the exact reason for this drop isn't clear, MATPB's [Regional Transportation Plan 2050](#) and [Transit Development Plan](#) make a number of [recommendations](#) to improve service and increase ridership, including:

- Implementing a Bus Rapid Transit System
- Implementing a regional transit authority to provide a dedicated source of funding
- Providing regional express transit service to suburban communities and corresponding park-and-ride lots to serve them
- Improving the existing system by reducing travel times, increasing frequency, increasing capacity, providing service to new neighborhoods, and enhancing first and last mile connections

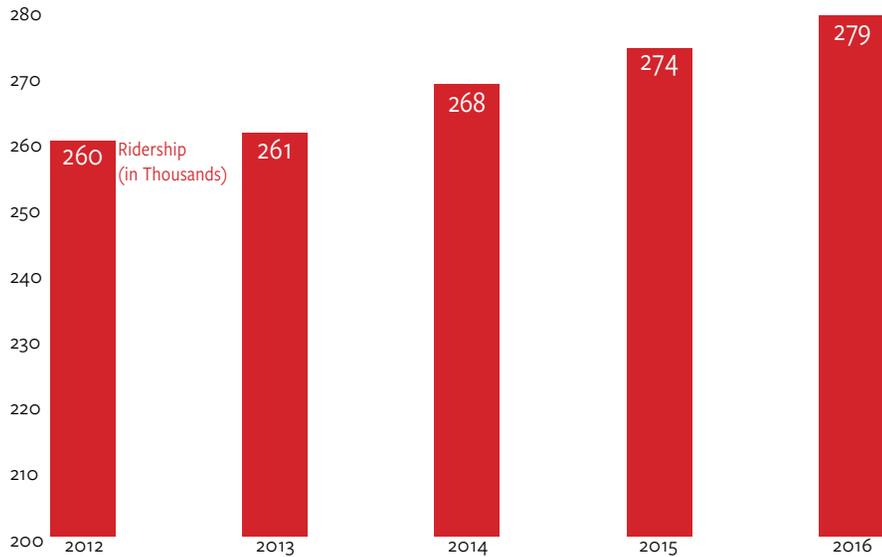
Many of the recommendations will not be possible without implementing a regional transit authority; however, some frequency increases and/or express/limited stop service could be provided by reducing service to underutilized routes. It remains to be seen whether these trends will continue. Further research is needed to determine the best short-term actions to begin to address the trend of declining ridership.



Metro Transit Fixed-Route Ridership and Service Hours



Metro Paratransit Ridership



Specialized Transportation Ridership

Transportation service targeting seniors and people with disabilities is provided by an array of different programs and partnerships between public agencies, non-profits, and private transportation operators. A one-call center operated by Dane County Department of Human Services (DCHS) helps users navigate the various programs.

Dane County’s Group Access Service, which covers the cities of Madison, Middleton, and Monona, and its Rural Senior Group Transportation Program, which covers the rest of the county, provide regularly scheduled accessible group rides for seniors and people with disabilities to destinations like congregate meal sites, community centers, and shopping. Use of the rural service declined from 2012 to 2015 before recovering some of its ridership in 2016. DCHS anticipates an increase in ridership for 2017 due to an increase in service hours. Metro Transit’s paratransit service provides the majority of door-to-door accessible service for people with disabilities in the Madison area. The program has seen strong ridership growth for the last five years.

Dane County Group Ride Program Ridership



DESIRED TREND



ACTUAL TREND



Fixed-Route Transit Service Area

Fixed-route transit service provides transportation open to the public on set routes using reliable schedules with buses stopping to pick up and drop off passengers at signed bus stops. Riders use the service for many purposes, but surveys show that routine trips like work and school commutes are much more likely to be made by transit. Service area coverage is an important metric because it shows the population that has access to this service.

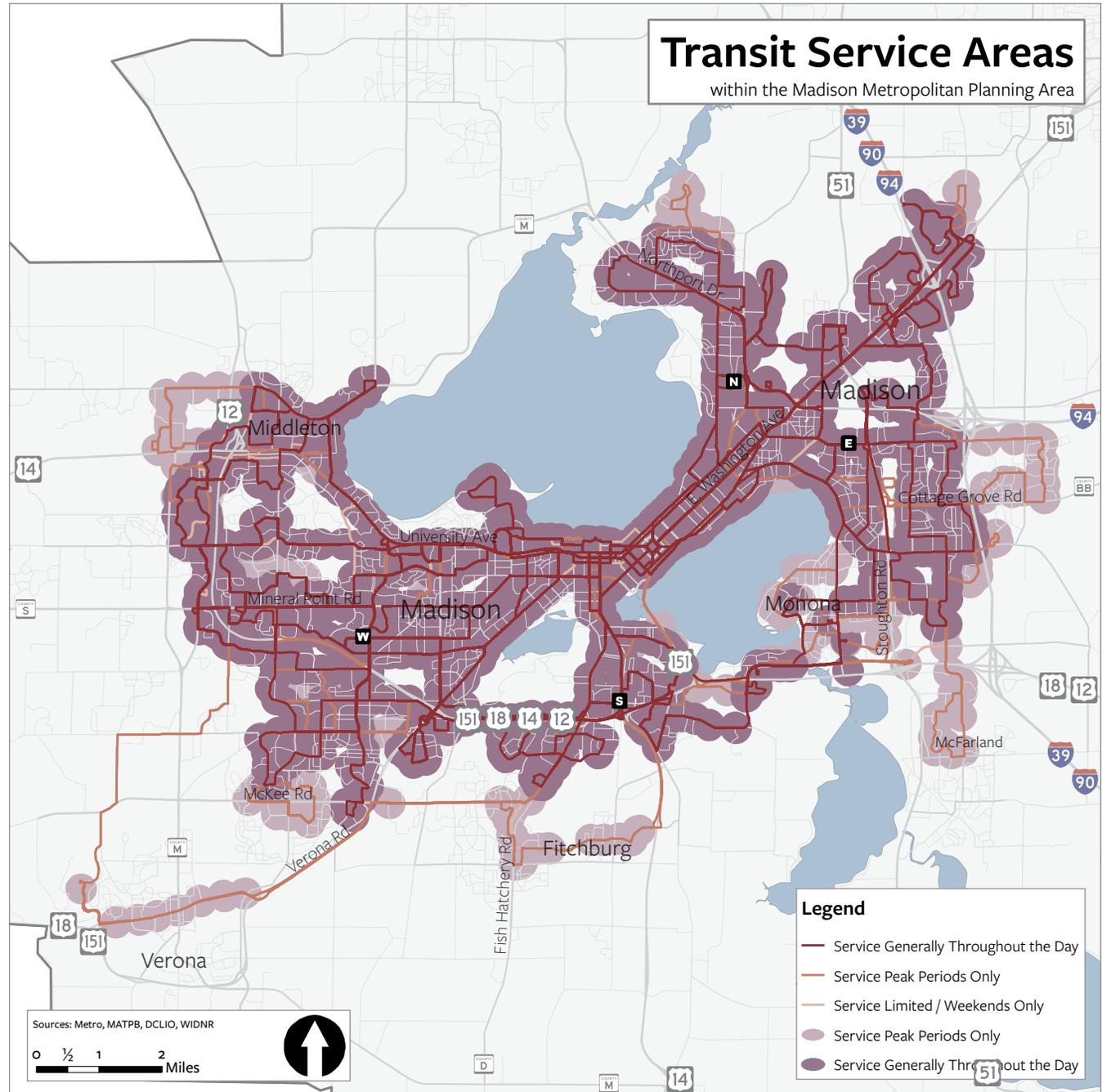
The fixed-route transit service area is defined as a ¼-mile buffer from a bus stop, equivalent to about a five-minute walk. All-day service covers more than 55.6 square miles and roughly 55.3% of all residents living within the Madison Metropolitan Area. Peak period-only routes extend coverage on weekday mornings and afternoons to 69.1 square miles and over 61.7% of residents. Peak period service is useful for traveling to first shift jobs, but does not provide all-day mobility to people for many other trips.

The fixed-route transit service area did not change in 2016 as compared to 2015 for peak period only or all-day service areas.

DESIRED TREND



ACTUAL TREND



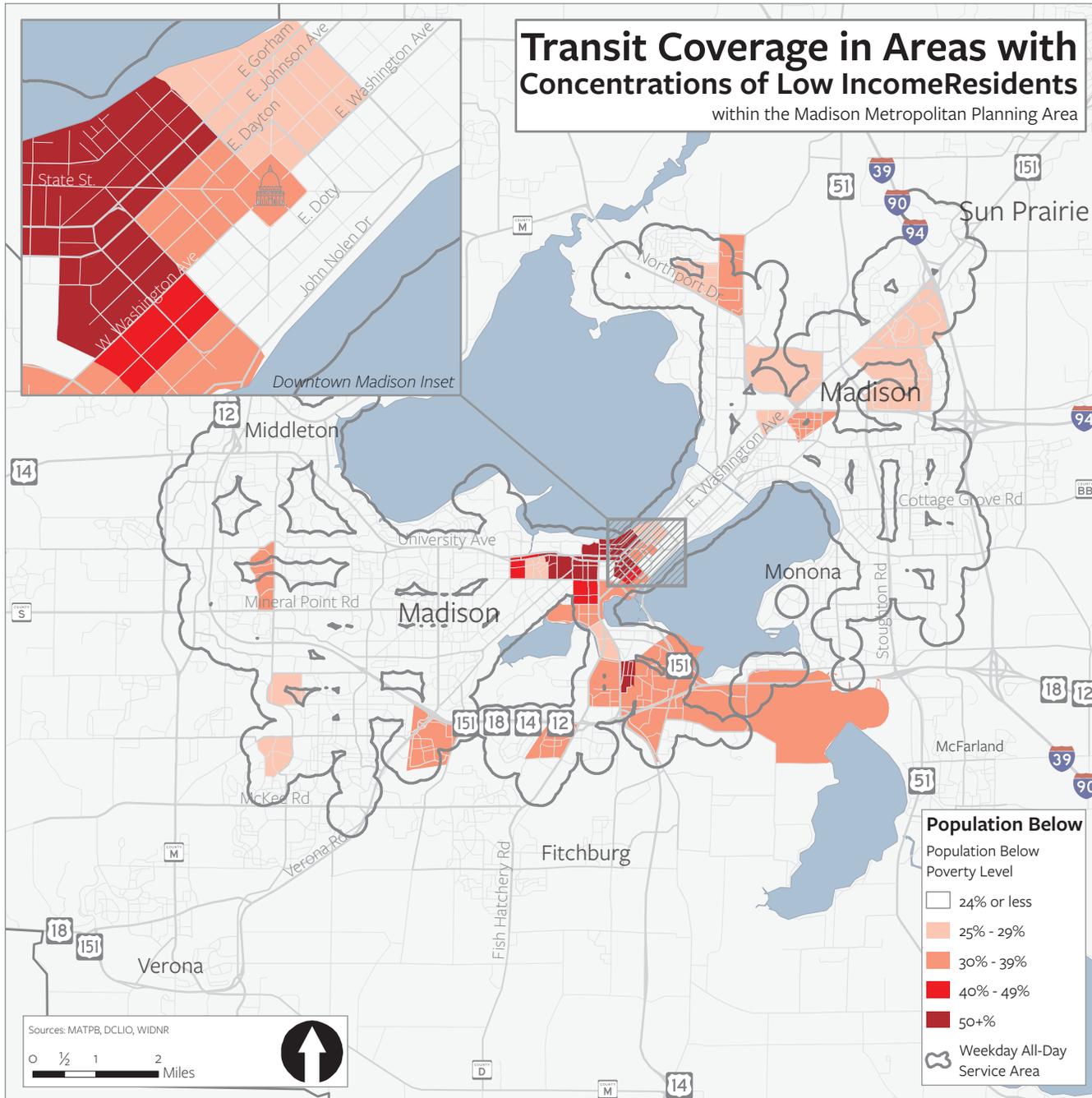
Transit Coverage for Minorities and Low Income Persons

Transit accessibility is important for all people, but especially for minorities and low-income families because they are more likely to rely on public transit than other segments of the general population.

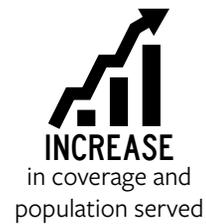
The 2015 Metro Transit On-board Survey provides a glimpse into who uses the public transportation system in the region. The survey revealed that an estimated 27% of transit riders are minority individuals (Black/African American, Asian, and other/multiple races) and 37% of riders, excluding college/university students, indicated they have a household income below \$35,000 per year. By comparison, the general population in the region is about 17% minority and the average regional household income is over \$60,000.

Overlaying the all-day fixed-route bus service area with census blocks with high concentrations of minority and low-income residents provides a visual representation of populations that have access to public transit. Overall, an estimated 70% of low-income residents and 63% of minority residents in the Madison Urban Area have access to all-day bus service.

2016 is a baseline year for this measure due to changes in data collection methodology.



DESIRED TREND

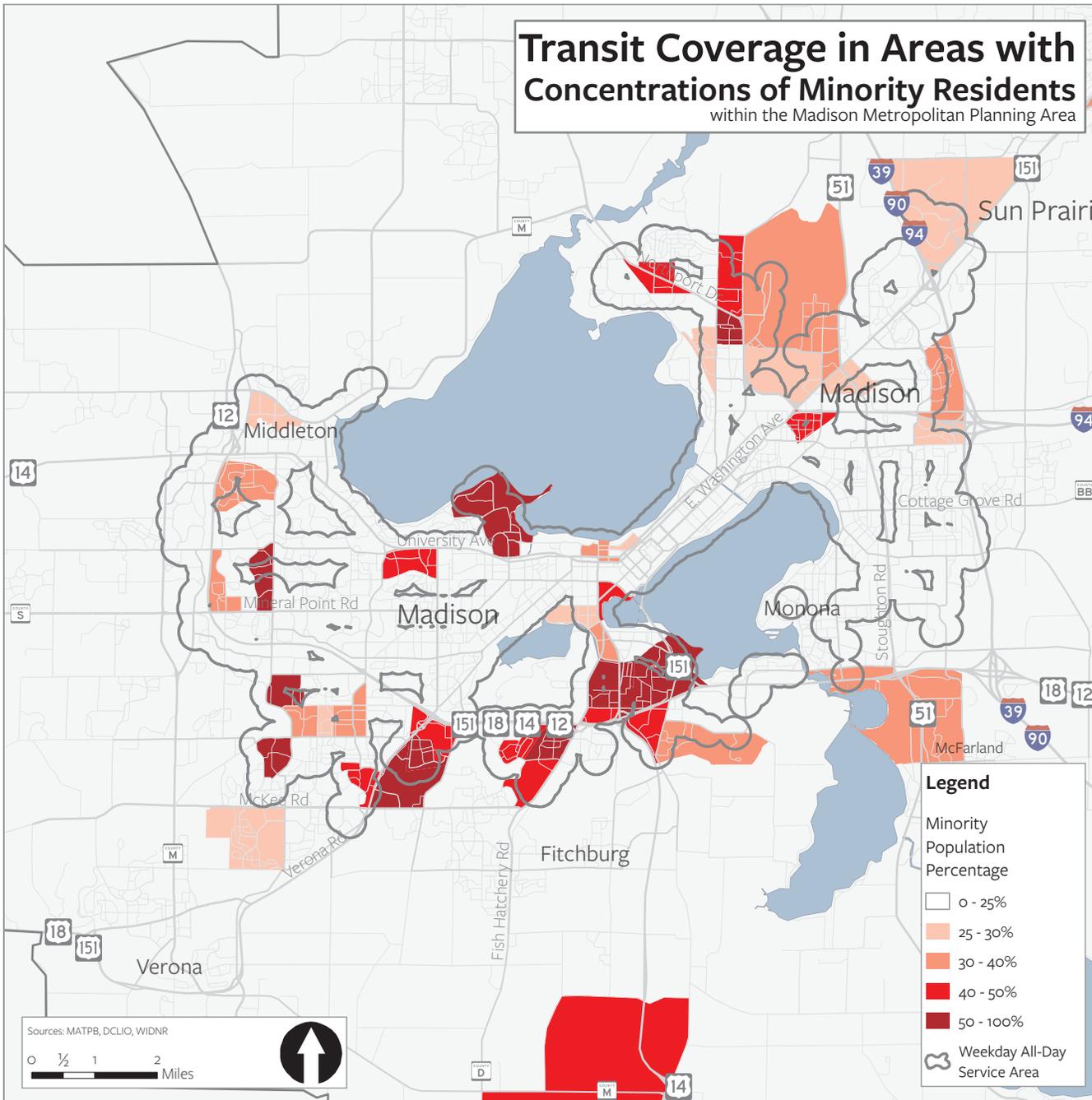


ACTUAL TREND



Source: Metro Transit. March 2015 transit routes and stops. US Census - 2010 Minority Population by Census Block

Transit Coverage in Areas with Concentrations of Minority Residents within the Madison Metropolitan Planning Area



Related Links and Information:

- [2015 Madison Metro Transit On-board Passenger Survey](#)
- [2013 - 2017 Transit Development Plan for the Madison Urban Area](#)
- [Title VI Non-Discrimination Program / Limited English Proficiency Plan](#)
- [Section 5310 Program Management and Recipient Coordination Plan](#)
- [Public Transit Trends in the Madison Area](#)
- [Metro Transit Paratransit Service Area Map](#)
- [Group Access Service Information](#)



Reduce the Environmental Impact of the Transportation System

Ensure that the transportation system is designed, built, operated, and maintained in a way that protects and preserves the natural environment and historic and cultural resources, and is supportive of energy conservation.

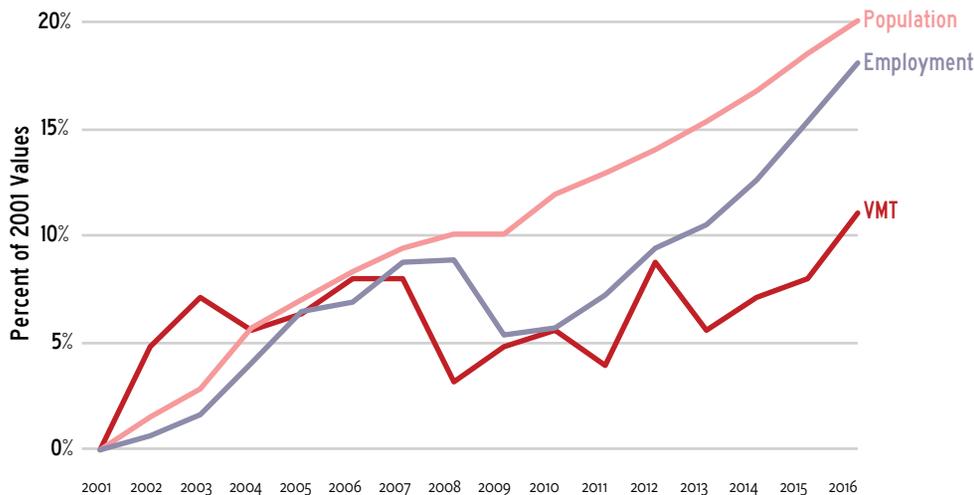
Reduce the Environmental Impact of the Transportation System

Vehicle Miles Traveled

Vehicle Miles Traveled (VMT) is a measure of all the miles driven within an area within a specified period. VMT can be influenced by a multitude of factors - population growth, the health of the economy, fuel and parking costs, accessibility of public transit and other transportation alternatives, weather, mix of land uses, and more.

VMT peaked in 2005 at the height of the housing boom and 2000s economic growth. In late 2007, fuel oil and heating-oil prices began to rise as the “housing bubble” burst. The result was the Great Recession, in which local unemployment increased to over 6%, while national unemployment increased to 10% at its height, and VMT sharply dipped. In Dane County, VMT began to rebound in 2012 and has continued to increase gradually ever since. Although VMT growth outpaced the rate of population and employment growth in the early 2000s, since the Great Recession VMT is increasing at a relatively slower rate compared to growth in both population and employment. The average daily VMT for Dane County in 2016 was 14,048,312. While it is likely that VMT will continue to rise as the region adds more people, the desired trend is that the growth of VMT will not outpace the growth of the region’s population, so that while there may be more people on the road, they are driving less frequently and/or shorter distances.

Dane County Annual Growth Trends: 2001 - 2016



Madison Area Car Facts 2016

 **\$12,680**
Annual Transportation Costs

 **1.71**
Autos Per Household

 **20,146**
Vehicle Miles Traveled per Household

 **8.38**
Annual Tons of Greenhouse Gas Emissions per Household
Source: CNT - MATPB fact sheet, 2016

DESIRED TREND


STEADY
total VMT

ACTUAL TREND


STEADY
total VMT

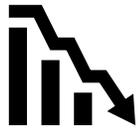
Mode of Transportation to Work

Commuting to work is one of the most predictable and common trips made by adults. About 70 percent of people aged 16 and older are part of the workforce population-roughly 46 percent of the total population. Work trips most often occur during congested time periods and are the largest contributor to travel time delay. They are also slightly longer than trips for other purposes and anchor travel for other purposes. In all, commuting represents more than 28 percent of all miles of personal travel. By reducing the number of work trips made by single occupant vehicles (SOVs), the region can reduce greenhouse gas emissions and increase the efficiency of the transportation network.

In Dane County three-quarters (74%) of all resident workers drove alone to work in 2016, slightly more than in recent years. This slight increase in people driving alone is largely due to a decrease in the number of workers carpooling or walking to work, whereas the percentage of workers taking transit, or bicycling to work has remained relatively constant.

Almost a quarter (23%) of City of Madison resident workers use public transit, bicycle, or walk to work compared to 13% of all Dane County residents. 66% of Madison workers drive alone to work and the percentage of work trips made by SOV's did rise in 2016. The increase in SOV trips for both City of Madison and Dane County residents is statistically significant and does indicate that the region is not meeting its goal of reducing SOV work trips.

DESIRED TREND



DECLINE

in # of residents driving to work alone

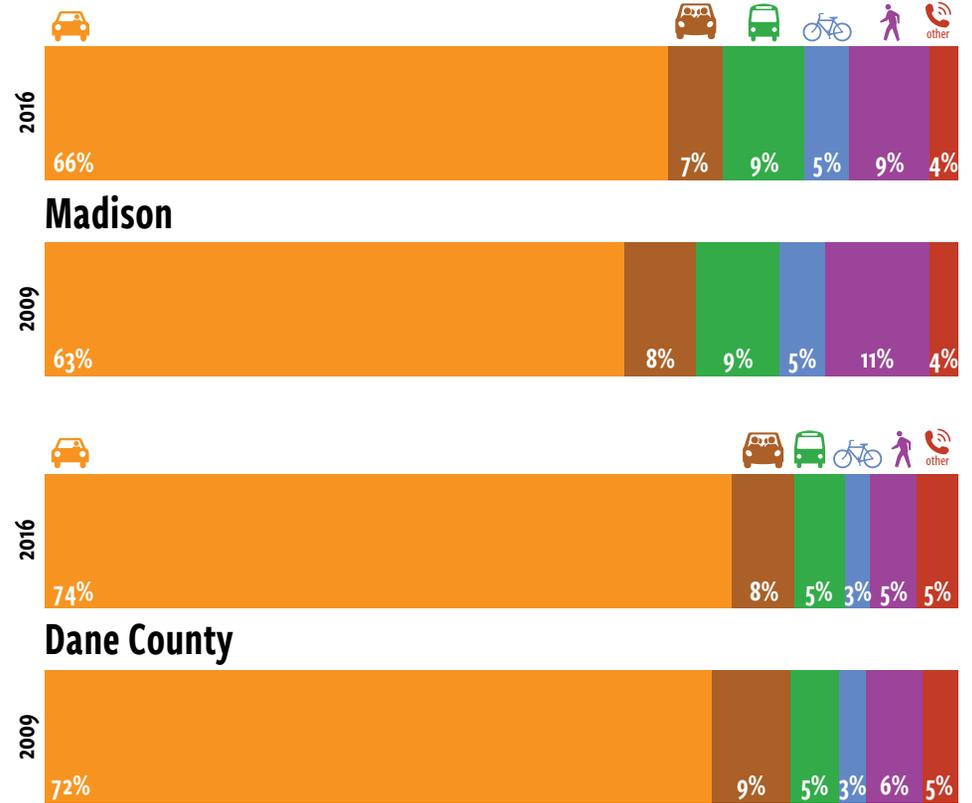
ACTUAL TREND



INCREASE

in # of residents driving to work alone

Mode of Transportation to Work



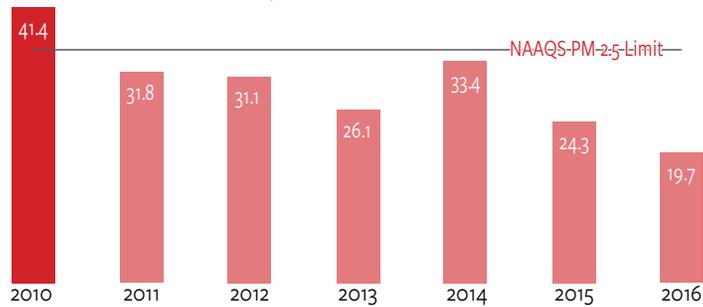
American Community Survey 1-year data

Air Quality

Examining the air quality of a region is one of the ways of measuring the impact of the transportation system on the environment. The Clean Air Act provides standards intended to protect human health and the environment for a variety of pollutants including ozone, fine particulate matter (PM 2.5), carbon monoxide, nitrogen dioxide, sulfur dioxide, and lead. Each of these air pollutants can be linked to specific adverse environmental and public health impacts. PM 2.5 is a component of acid rain, and is the main cause of reduced visibility (haze). Exposure to PM 2.5 can also lead to a variety of adverse health effects, as particle pollution can be absorbed into the body through the lungs and has been linked to a variety of serious health conditions or illnesses such as coughing/difficulty breathing, decreased lung function, asthma, irregular heartbeat, nonfatal heart attacks, and premature death in people with heart or lung disease. Ozone's health effects include causing shortness of breath, damaging the airways, aggravating lung diseases, increasing the frequency of asthma attacks, and causing chronic obstructive pulmonary disease.

Advances in technology and federal policies have led to improved air quality over the past decades; however transportation decisions and investments can still negatively impact air quality. Emissions from transportation account for 26% of total U.S. greenhouse gas emissions- second only to the electricity sector. An urbanized area with a population greater than 50,000 people may be classified as a non-attainment area if any of the six pollutants identified under the Clean Air Act exceeds the National Ambient Air Quality Standards (NAAQS). If an MPO is in a designated non-attainment area there are additional requirements on how federal transportation dollars can be spent to ensure consistency with achieving air quality goals.

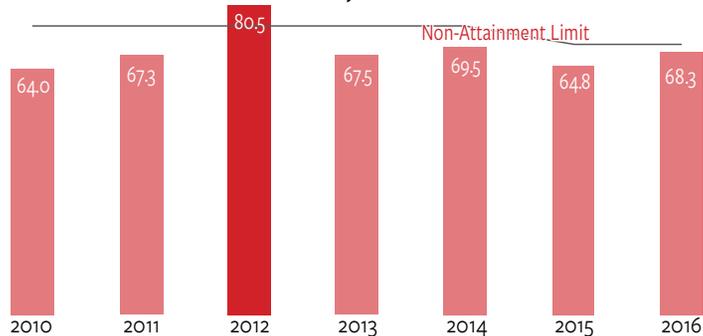
24-Hour PM_{2.5} Levels* in Micrograms/Cubic Meter (LC)



In the Madison region, PM 2.5 and ozone are measured daily at the University of Wisconsin- Madison campus. Over the past six years, PM 2.5 levels have steadily declined, staying safely below the NAAQS limit of 35 micrograms/cubic meter. The region's current PM 2.5 levels pose no significant health risks.

Unlike PM 2.5, the region's ozone levels have remained relatively consistent, posing a moderate health concern for area residents. In 2012 levels on some summers days were high enough to be considered "unhealthy for sensitive groups." In 2015 the NAAQS limit for ozone was reduced from 75 parts per billion (ppb) to 70 ppb. The average of the four highest ozone level days was 68.3 ppb in 2016. If the region's ozone levels, which are greatly influenced by summer weather, do not begin to trend downwards the region may be at risk of being designated as a non-attainment area for ozone in the future.

8 Hour Ozone Levels* in Parts per Billion



No Health Concern Moderate Health Concern Unhealthy for Sensitive Groups

*Average of four highest reading days in the year.

Source: US EPA

DESIRED TREND



ACTUAL TREND





**Advance System-wide Efficiency,
Reliability, and Integration Across Modes**
Design, build, operate, and maintain an efficient transportation system with supportive land use patterns that maximizes mobility, minimizes unexpected delays, and provides seamless transfers between all modes.

Advance System-Wide Efficiency, Reliability, and Integration Across Modes

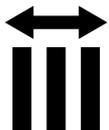
Transit On-time Performance

Reliability is crucial for a transit system. People using transit are more likely to be traveling to work and unreliable transportation options can result in people arriving late to work through no fault of their own. Further, many trips require transfers between buses – missed transfers can strand riders for up to an hour. When these things happen, riders are likely to stop using transit.

For this analysis, a bus is considered late if it arrives at a “time point” five or more minutes late. Conversely, a bus is considered early if it arrives at a “time point” one minute or more early. In many cases, late buses are the result of traffic congestion caused by accidents and road construction as well as other events that are beyond Metro’s control. Early buses, however, are sometimes caused by drivers not waiting at time points - a behavior that Metro can remedy.

Metro Transit’s on-time performance has fluctuated between 84% and 86% for the past seven years. These on-time performance numbers represent a reasonably high level of reliability for an urban transit system. However, Metro’s timed transfer (“pulse”) system requires a very high level of on-time performance and routes and schedules have been created and adjusted to achieve this – in some cases sacrificing travel time in favor of reliability.

DESIRED TREND



STEADY
percentage of
on-time buses

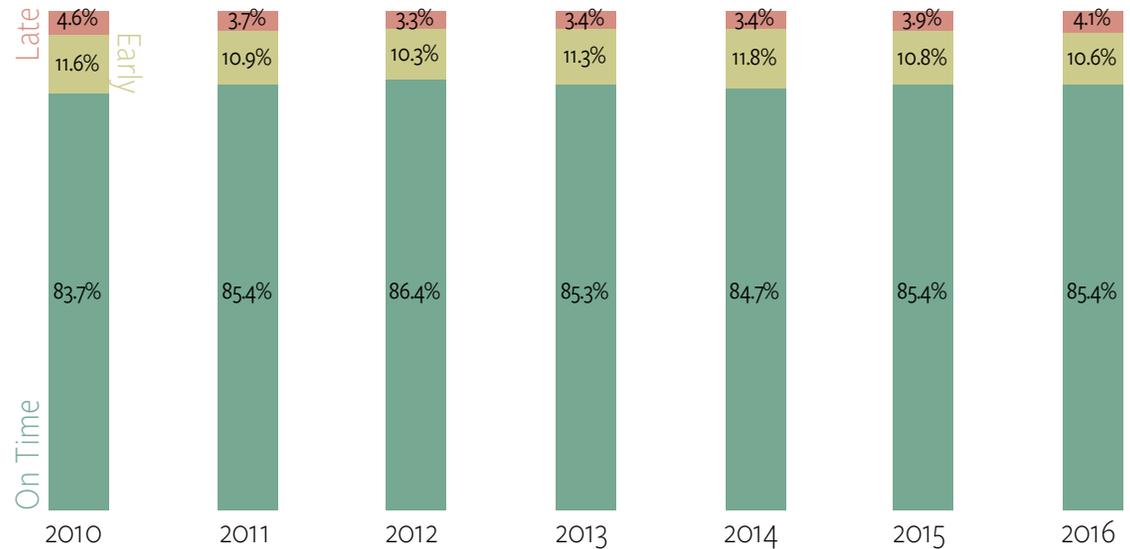
ACTUAL TREND



STEADY
percentage of
on-time buses

Madison Metro Transit On-Time Performance

Percentage of buses arriving on-time, 5+ minutes late, or 1+ minutes early

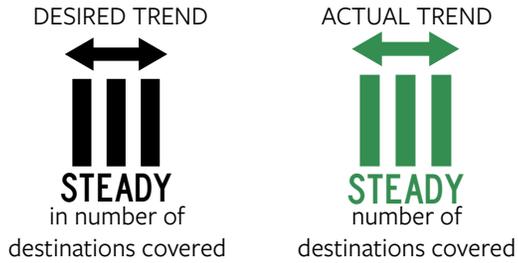


Source: Metro Transit

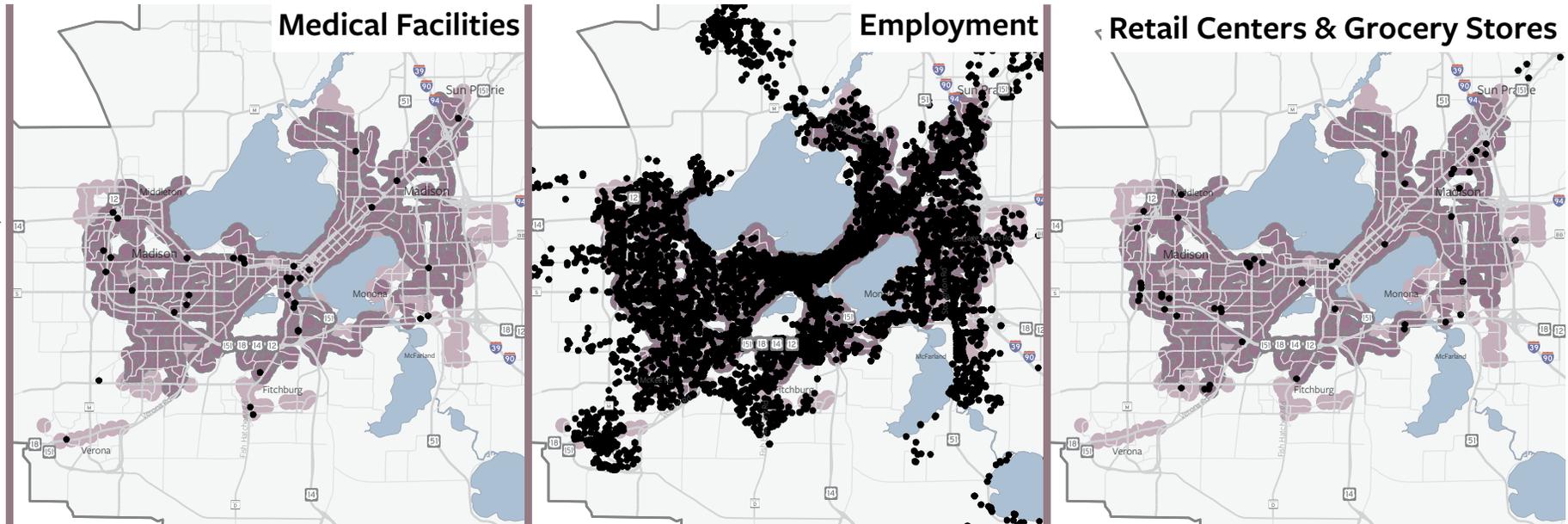
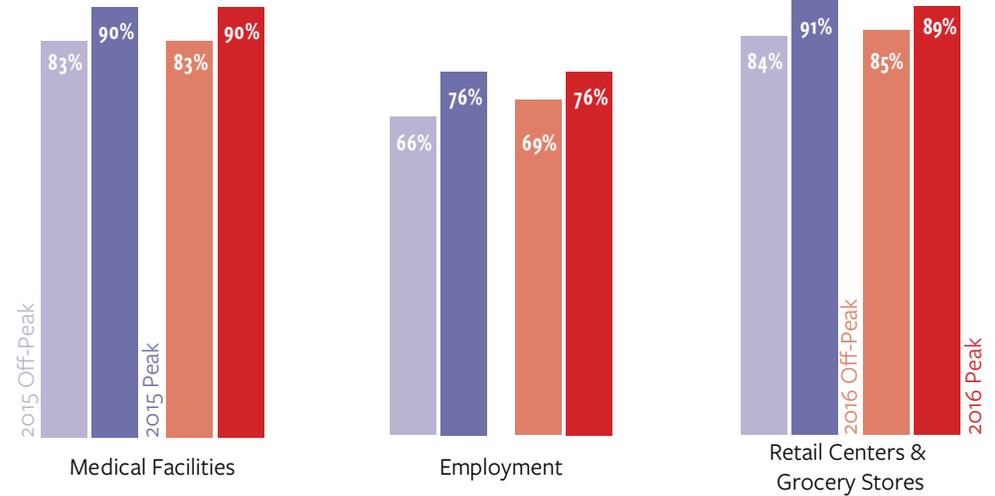
Percent of Key Destinations Served by Transit

To provide utility to riders, transit must serve the places that people want to go. Key destinations include jobs, medical facilities, and grocery/retail stores. With the exception of some jobs, it is important that these destinations are accessible not only during morning and afternoon peak periods, but also throughout the day and on weekends.

During the last year coverage for medical facilities remained steady, while slight fluctuations occurred for employment and grocery/retail coverage. Off peak service coverage of employment areas and retail/grocery stores increased from 2015 to 2016, while peak service coverage held steady for employment and contracted for retail and grocery stores. This occurred in part due to removal of Sun Prairie fixed-route transit service as well as some changes to the destinations being measured such as stores going out of business.



Percent of Destinations Served by Transit within Metropolitan Planning Area Boundary



Roadway Congestion and Reliability

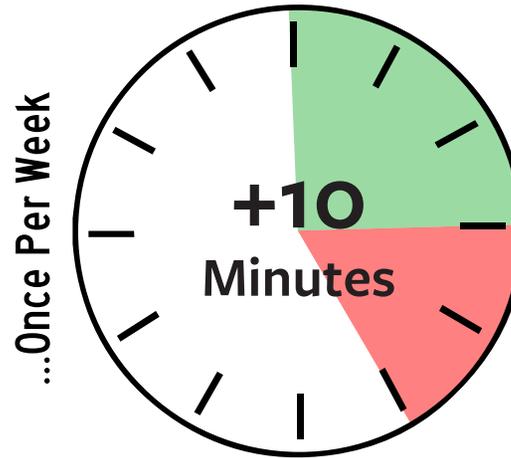
Roadway congestion is a common challenge commuters in urban areas face during the morning and evening rush hours. Congested roadways are typically characterized by slower speeds resulting in longer trip times. Roughly 50% of congestion is considered recurring, that is congestion that is expected on any given day due to physical bottlenecks, limited capacity, or operational issues caused by things such as inadequately timed traffic signals or poor access management. Recurring congestion typically occurs during peak travel periods in the morning and evening and with roadways functioning at normal speeds during non-peak hours. The other 50% of congestion is considered non-recurring, caused by unexpected temporary disruptions such as traffic incidents, including crashes or vehicle mechanical issues, work zones, poor weather conditions, and special events that may lead to a surge in traffic demand.

Drivers generally budget extra time to allow for recurring travel delays, whereas unanticipated variability or delays can be a source of frustration as it can make commuters late for work, cause buses to run late, make business travelers late for appointments or meetings, cause truckers to be charged for later deliveries, and can disrupt the just-in-time delivery process. Complicating things, many of these non-recurring sources of congestion can trigger another source to occur (weather event causing crash, special event making work zone bottleneck worse, etc.).

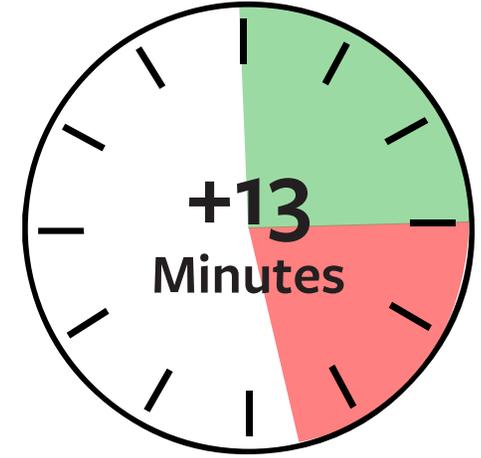
In many cases, rush hour congestion is difficult or impossible to solve due to physical constraints and the costs and negative impacts of roadway and intersection capacity expansion. However, reliability can be improved through a variety of operational enhancements or incident response management techniques. This means that by implementing a comprehensive congestion management process that includes transportation demand and system management and operations strategies such as transit and ride-sharing incentives, advanced traffic signal coordination, traveler information, and enhanced incident response, along with physical bottleneck relief through targeted capacity expansion where feasible, unexpected delays can be expected to occur less frequently, and for a shorter duration.

Travel Time Index (TTI), a common measure of congestion, is defined as the average time it takes to travel on a roadway during the peak period relative to the time when no congestion is present. This means that if a commute along a corridor would take 15 minutes without congestion and it has a TTI of 1.64 at 8AM, the trip will take 25 minutes on average at that particular time (15 minutes x 1.64 = 25 minutes).

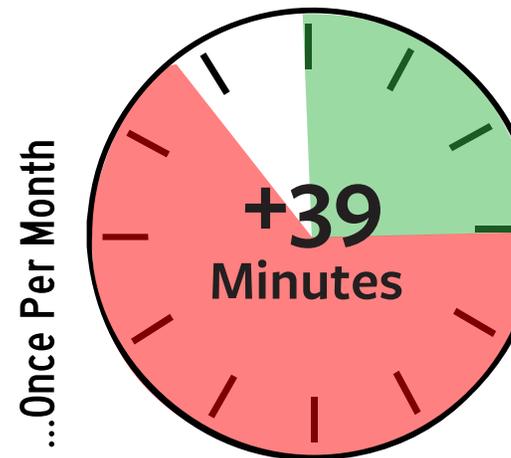
In 2016, a Normal 15 Minute Trip On Average Took...



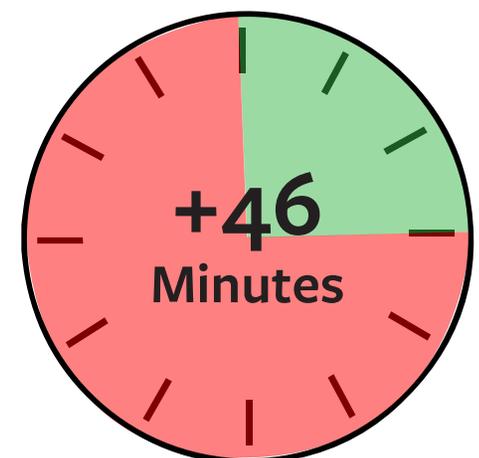
Total Trip Time Up to **25 Minutes**
During the **Morning** Rush Hour



Total Trip Time Up to **28 Minutes**
During the **Evening** Rush Hour



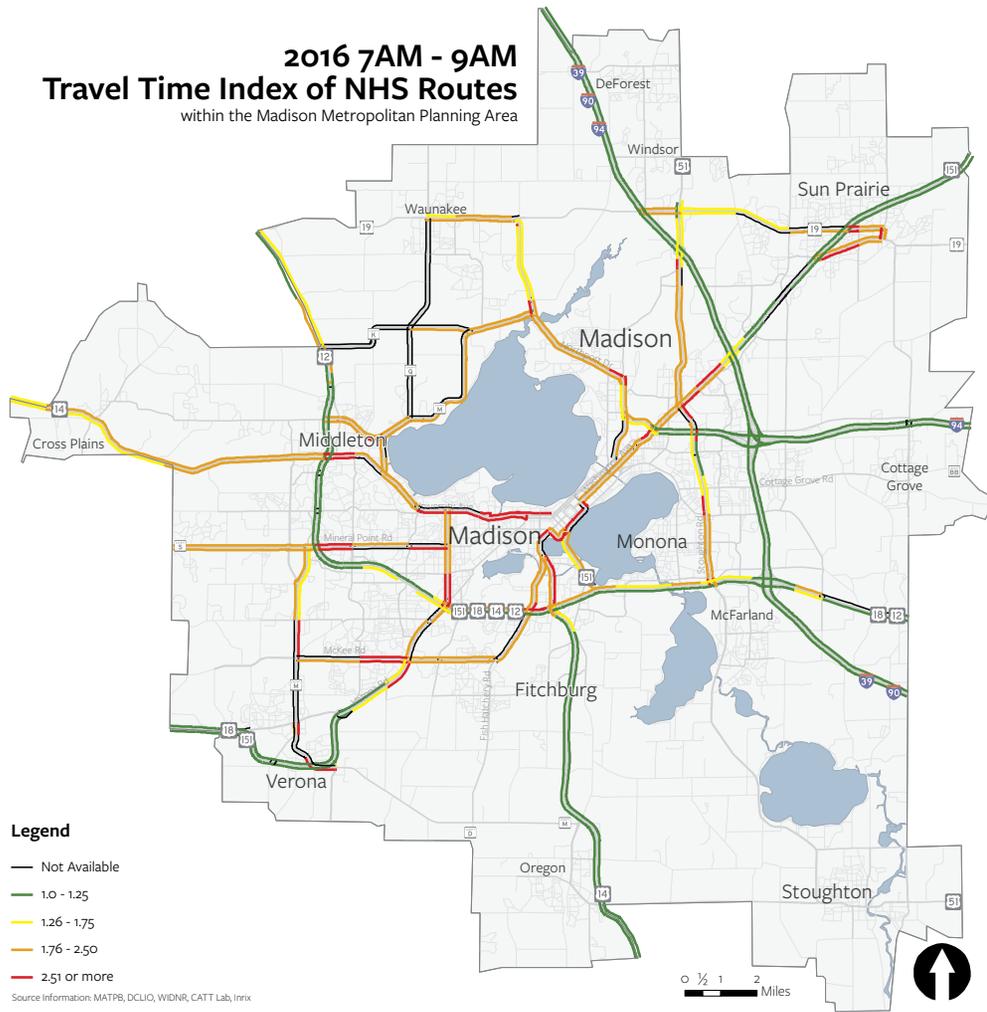
Total Trip Time Up to **54 Minutes**
During the **Morning** Rush Hour



Total Trip Time Up to **61 Minutes**
During the **Evening** Rush Hour

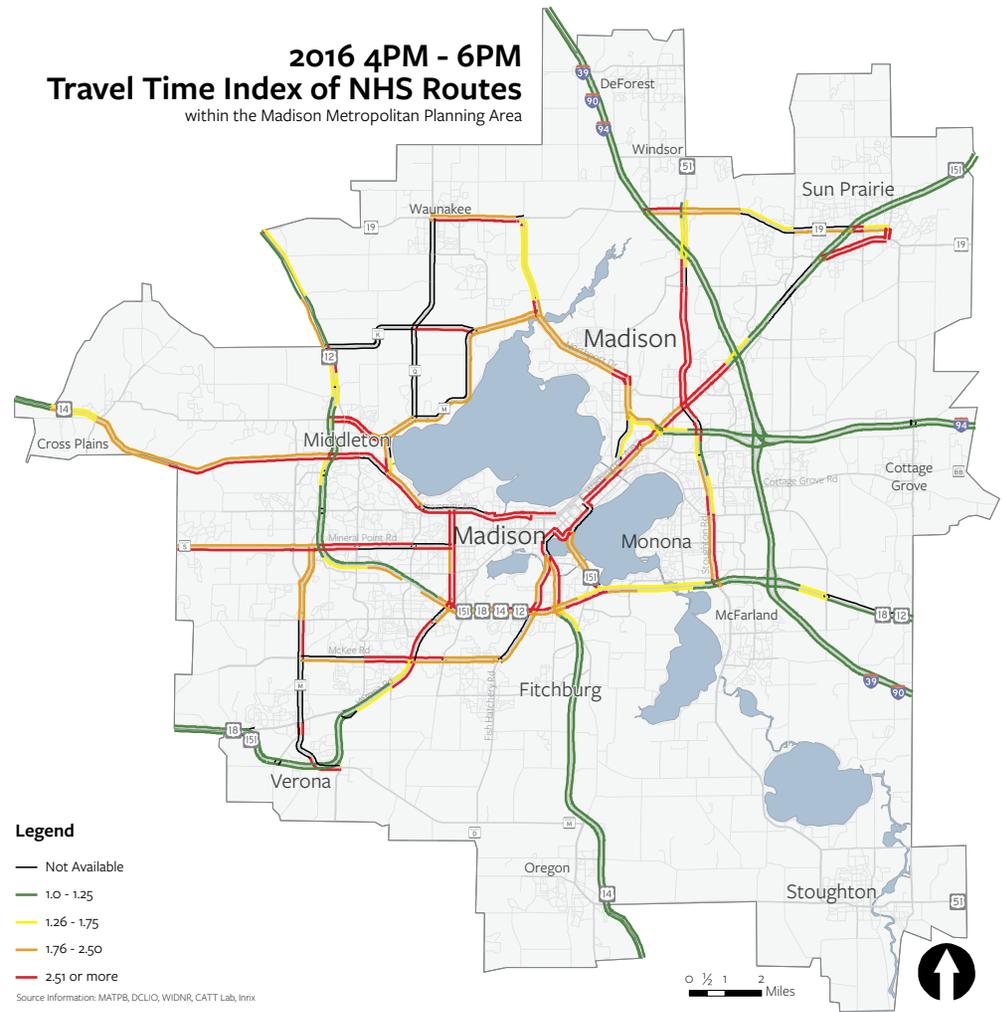
2016 7AM - 9AM Travel Time Index of NHS Routes

within the Madison Metropolitan Planning Area



2016 4PM - 6PM Travel Time Index of NHS Routes

within the Madison Metropolitan Planning Area



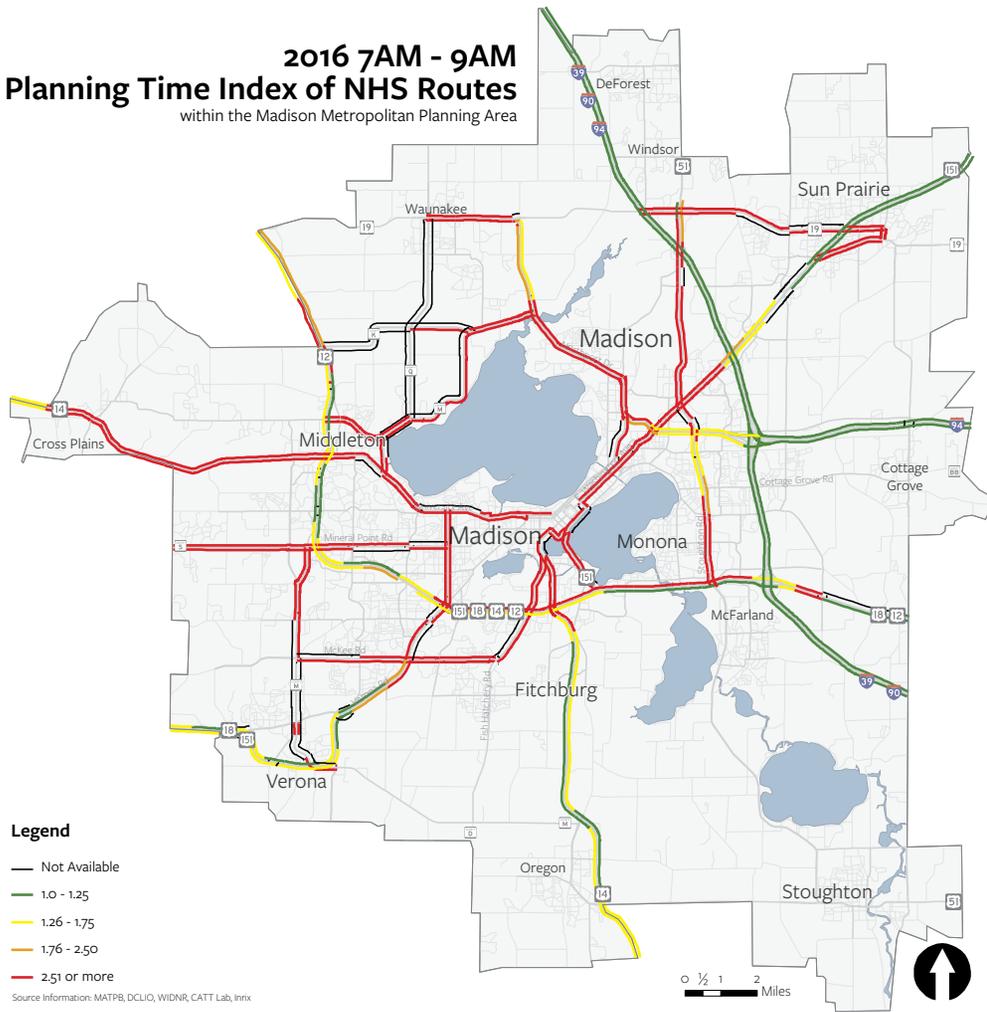
Planning Time Index (PTI), a common measure of reliability, is defined as a measure of time that should be planned for when an adequate buffer is included in a trip to ensure on-time arrival 95% of the time, accounting for the highest travel delay for a trip experienced on average once per month. This means that if a driver were to have a 15-minute trip on a corridor with a PTI of 3.04, they should plan to allot 54 minutes for their commute to ensure they are on time 19 out of 20 times (15 minutes x 3.04 = 54 minutes). The greater the difference between TTI and PTI, the more travel time variability drivers experience.

Stoughton Road, John Nolen Drive, East Washington Avenue, University Avenue, McKee Road, and the Beltline stand out as some of the most congested and least reliable roadways

in the regional system, while the Interstate experiences the most reliable travel times of National Highway System (NHS) routes. The NHS system includes all major or so-called “principal” arterials. Overall Madison’s regional roadway system tends to be more congested and less reliable during the evening rush hour (4PM-6PM) as compared to the morning rush hour (7AM-9AM). System-wide TTI in 2016 during the morning rush hour was 1.64, a slight decrease from 2015, while the evening rush hour was 1.86, a slight increase over 2015. System-wide PTI during the morning rush hour was 3.04, identical to the year prior, while the evening rush hour was 4.05, an increase over 2015.

The federal performance measure rules for congestion and reliability introduce a new

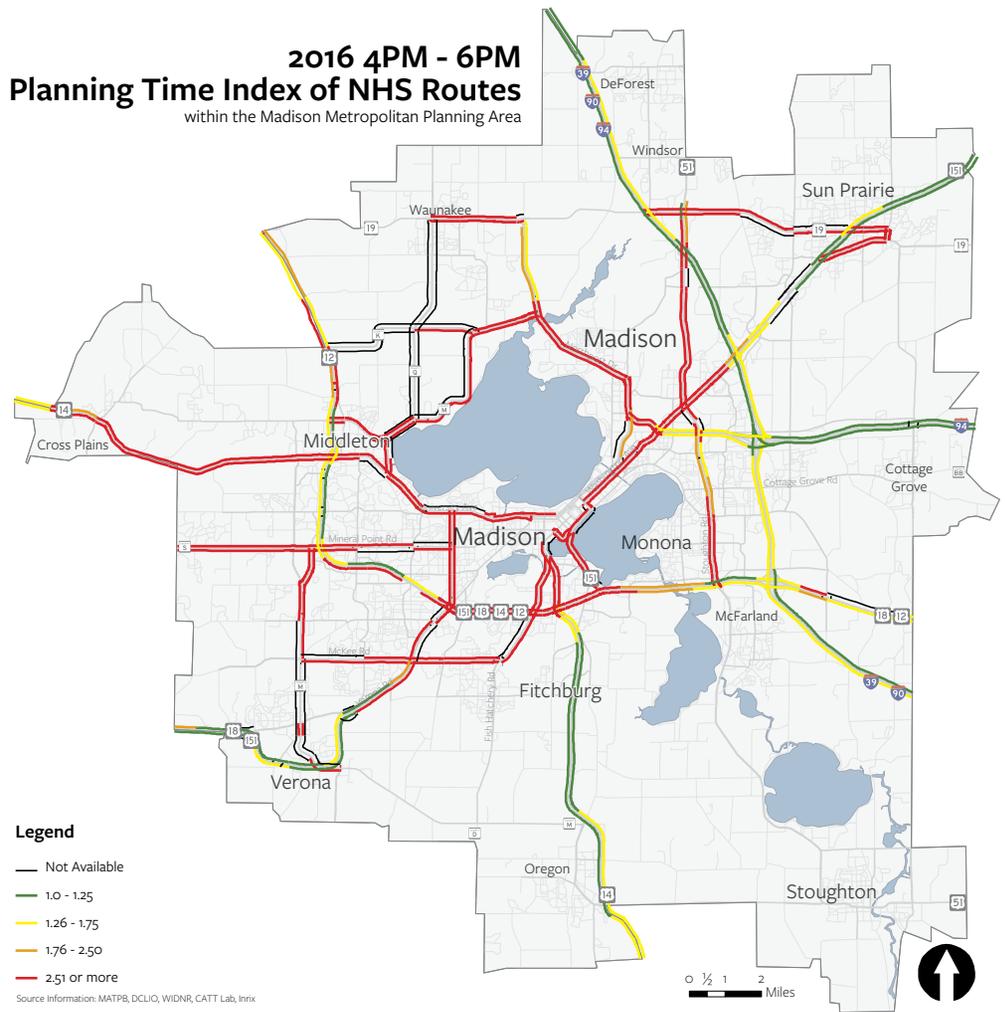
2016 7AM - 9AM
Planning Time Index of NHS Routes
 within the Madison Metropolitan Planning Area



- Legend**
- Not Available
 - 1.0 - 1.25
 - 1.26 - 1.75
 - 1.76 - 2.50
 - 2.51 or more

Source Information: MATPB, DCLIO, WIDNR, CATT Lab, Inrix

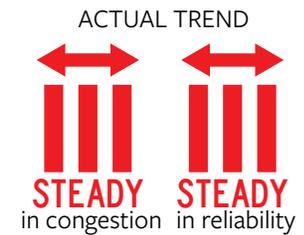
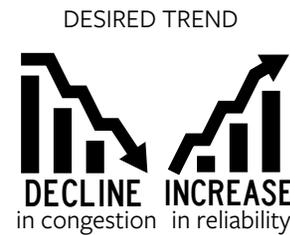
2016 4PM - 6PM
Planning Time Index of NHS Routes
 within the Madison Metropolitan Planning Area



- Legend**
- Not Available
 - 1.0 - 1.25
 - 1.26 - 1.75
 - 1.76 - 2.50
 - 2.51 or more

Source Information: MATPB, DCLIO, WIDNR, CATT Lab, Inrix

measure for calculating level of travel time reliability (LOTRR), reporting the percentage of the Interstate System and non-Interstate NHS providing for reliable travel times, as well as a measure of truck time reliability to measure freight movement. These measures will be incorporated into the MATPB performance report in the future as the Federal Highway Administration (FHWA) provides more guidance for reporting these measures.





Establish Financial Viability of the Transportation System

Achieve and maintain a state of good repair for the existing transportation system, invest in cost-effective projects, and ensure adequate, reliable funding to meet current and future needs.

Establish Financial Viability of the Transportation System

Buses At or Past Replacement Age

Like any vehicle, buses cost more to operate and repair near the end of their useful life; however, replacing buses is expensive and not always possible due to funding constraints. Also, Metro Transit uses its oldest buses for supplemental school service, other peak period only service, and as backups for buses in service. These buses log far fewer miles per day. Thus, it makes financial sense to maintain some older buses in its fleet for such limited service.

Between 2008 and 2012, the number of buses at (13-14 years) or past what Metro considers replacement (15+ years) age precipitously declined year-after-year due to a more aggressive replacement schedule aided by an unexpected influx of Federal American Recovery and Reinvestment Act (ARRA) funding. Due to a sharp decline in Federal funding available to Metro with changes in Federal transit funding programs, the percentage of the fleet at or near replacement has reached 2009 levels once again.

The number of vehicles past replacement age has held steady at 39 or 18% of the fleet since 2014.

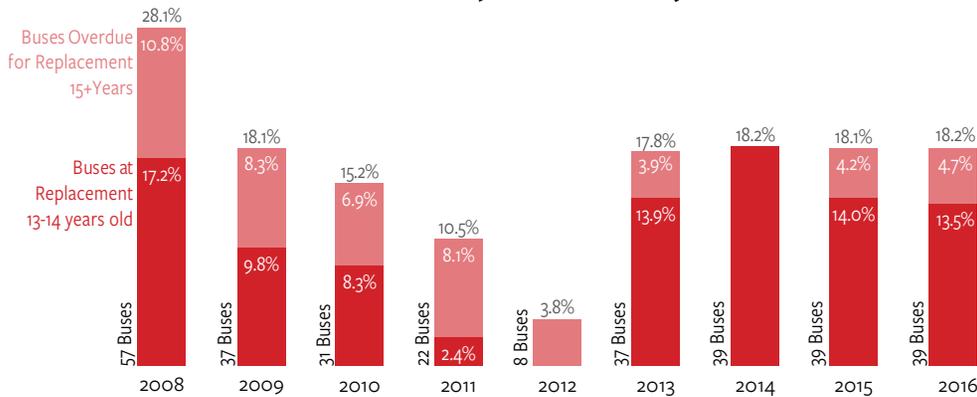


14 year old bus.



11 year old bus.

Metro Transit Buses At or Past Replacement Age



Source: Metro Transit

DESIRED TREND



ACTUAL TREND



Bridge Condition

A new rule enacted this year by the Federal Highway Administration (FHWA) has changed the required bridge condition performance measures. Under the new rule, states and MPOs must track the percentage of bridges on the National Highway System (NHS) that are in good and poor condition. Each bridge is rated on the condition of its deck, superstructure, and substructure, and its overall condition is determined by the lowest of these scores. Scores of 7 or more are considered “good,” and scores of 4 or below are considered “poor.” The percentage of bridges in good or poor condition is based on the total deck area of the bridges, not the raw number of bridges in each category.

In the Madison metropolitan area there are 158 NHS bridges. Of these, 47% are in good condition and just 1% are in poor condition.

There are an additional 127 bridges in the Madison metropolitan area that are not part of the NHS. 65% of these non-NHS bridges are in good condition, while 7 percent are in poor condition.

2016 is a baseline year for this measure due to the change in methodology to meet the new FHWA rule.

DESIRED TREND



INCREASE

in NHS bridges in Good condition

ACTUAL TREND



UNKNOWN

DESIRED TREND



INCREASE

in NHS bridges in Poor condition

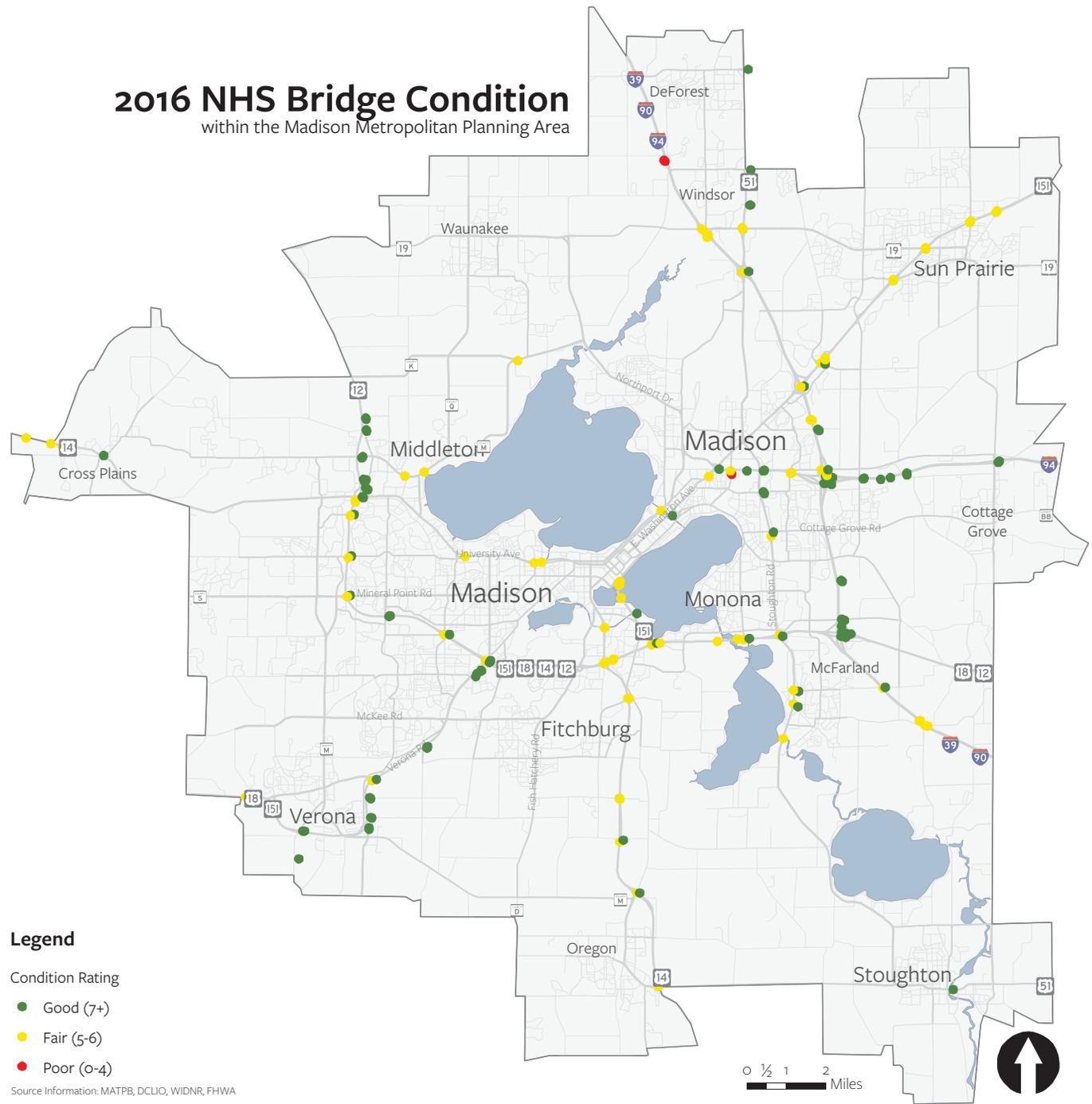
ACTUAL TREND



UNKNOWN

2016 NHS Bridge Condition

within the Madison Metropolitan Planning Area



Legend

Condition Rating

● Good (7+)

● Fair (5-6)

● Poor (0-4)

Source Information: MATPB, DCLIO, WIDNR, FHWA

2016 NHS Bridge Condition

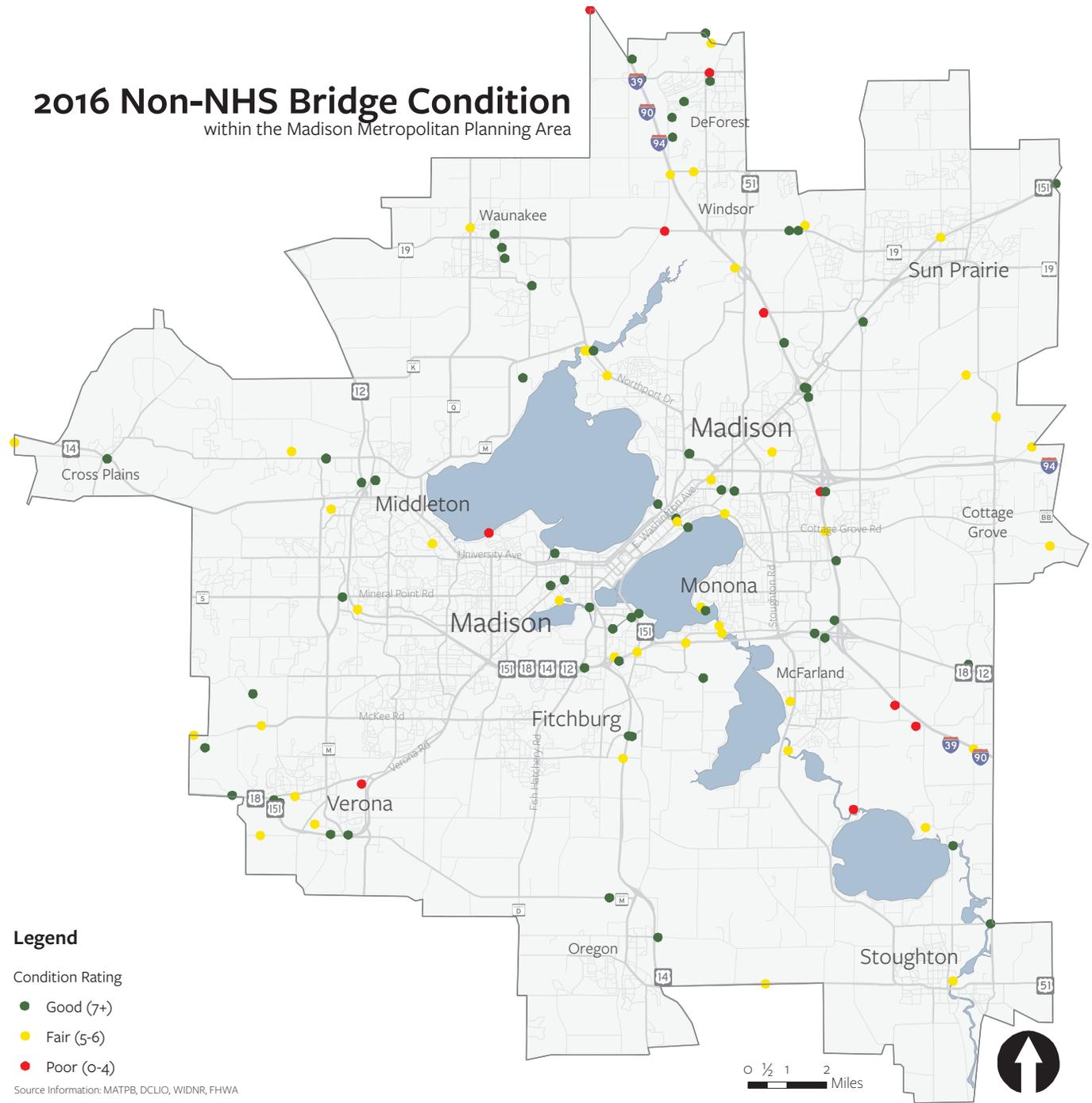
Condition	Deck Area	Percent
Good	82,814	47%
Fair	91,602	52%
Poor	1,657	1%
TOTAL	176,073	100%

2016 Non-NHS Bridge Condition

Condition	Deck Area	Percent
Good	41,784	65%
Fair	17,539	27%
Poor	4,487	7%
TOTAL	63,810	100%

2016 Non-NHS Bridge Condition

within the Madison Metropolitan Planning Area



Performance Measures Overview

Measure	Desired Trend	Actual Trend	Analysis
Miles of Pedestrian Facilities	 Increase in miles of facilities	? Rebaselining	Collection methodology changed, leading to rebaselining of data.
Miles of Bicycle Facilities	 Increase in miles of facilities	? Rebaselining	Rebaselining due to a change in the MATPB bicycle database to add facilities missing from 2015 PMR.
BCycle Utilization	 Increase in utilization	 Maintaining utilization	BCycle miles biked, average trip length, and population served slightly increased while the number of trips made, members, and stations slightly decreased.
Motor Vehicle Crash Fatalities	 Decline in 5-year average # of fatalities	 Increase in 5-year average of fatalities	2016 saw highest number of fatalities (38) since 2008.
	 Decline in 5-year average rate of fatalities	 Decline in 5-year average rate of fatalities	Decrease in fatality rate due to VMT increase.
Motor Vehicle Serious Injuries	 Decline in 5-year average # of serious injuries	 Decline in 5-year average of serious injuries	Decrease of 3.6% compared to prior 5-year average.
	 Decline in 5-year average rate of serious injuries	 Decline in 5-year average rate of serious injuries	Decrease of 5% compared to prior 5-year average.
Pedestrian and Bicycle Fatalities and Serious Injuries	 Decline in 5-year average # of non-motorized fatalities and serious injuries	 Increase in 5-year average of non-motorized fatalities and serious injuries	Increase of 3.5% compared to prior 5-year average.
Airline Passenger Traffic	 Increase in passengers	 Increase in passengers	Passenger volume increased by nearly 10% in 2016.
Housing + Transportation Costs	 Maintain H + T Costs	 Maintain H + T Costs	Increases in average household income coupled with a reduction in fuel prices led to a decline in H+T costs and slight, but not statistically significant, increase in affordability.
Transit Access to Employment	 Increase in access to employment	 Decline in access to employment	Route simplification to straighten routes and increase reliability led to a slight decrease in access. This was likely a net-positive for overall service.
Transit Ridership	 Increase in ridership	 Decline in ridership	Tracking with a national trend. A drop in gas prices, strong economy, and mild winter may have contributed to the drop in ridership.
Specialized Transportation Ridership	 Increase in ridership	 Increase in ridership	Paratransit ridership continues to increase while group ride participation has plateaued.
Fixed-Route Transit Service	 Maintain coverage and population served	 Maintain coverage and population served	Coverage hasn't changed since stops have remained in place and revenue hours of service remained unchanged from previous levels.
Transit Coverage for Minorities and Low Income Persons	 Increase in coverage and population served	? Rebaselining	Methodology was changed to ensure similar geographies were used for low-income and minority maps.
Vehicle Miles Traveled	 Maintain total VMT	 Increase in total VMT	VMT increased 3% in 2016.
Mode of Transportation to Work	 Decline in number of residents driving to work alone	 Increase in the number of residents driving to work alone	Three-quarters of people drive to work alone in Dane County.
Air Quality	 Decline in air pollution levels	 Steady air pollution levels	While particulate levels have been dropping for years, Ozone levels are close to non-attainment limits.
Transit On-time Performance	 Maintain percentage of on-time buses	 Maintain percentage of on-time buses	A transfer point-based system relies on strong on-time performance. The system continues to perform well as routine route and schedule modifications take place.
Percent of Key Destinations Served by Transit	 Maintain number of destinations served	 Maintain number of destinations served	Because funding is unavailable to expand service, maintaining service is the desired trend.
Roadway Congestion and Reliability	 Decline in congestion	 Maintaining congestion levels	No major capacity expansion projects occurred in 2016.
	 increase in reliability	 Maintaining reliability levels	Unreliable corridors have not had significant investments made to relieve the existing issues leading to unreliable road conditions.
Buses at or Past Replacement Age	 Maintain percentage of old buses	 Maintaining in percentage of old buses	Proactive management of the bus fleet and creative funding has led to maintaining the number of buses at or past replacement age for 4 years.
Bridge Condition	 Increase number of NHS Bridges in Good Condition	? Baseline year	Measure changed to align with federal requirements.
	 Maintain number of NHS Bridges in Good Condition	? Baseline year	Measure changed to align with federal requirements.